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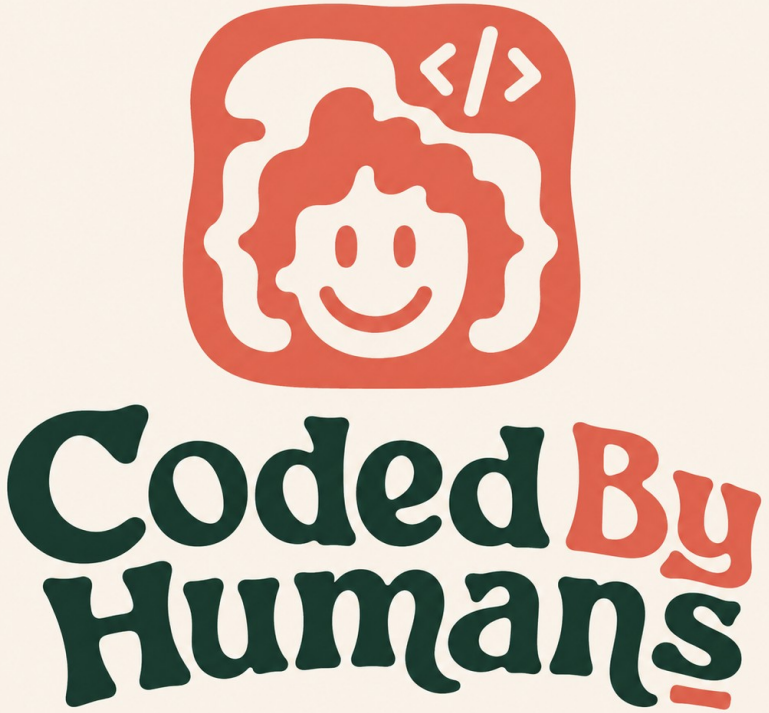

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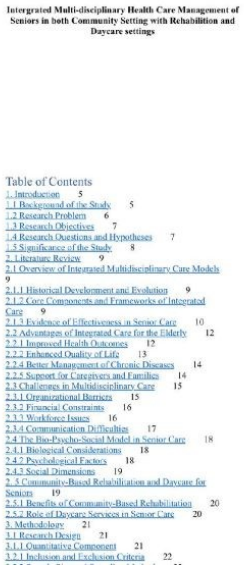

Intergrated Multi-disciplinary Health Care Management of Seniors in both Community Setting with Rehabilitation and Daycare settings

Table of Contents


1. Introduction

1.1 Background of the Study

The elderly population is on the rise in many countries across the globe and this has greatly stretched the capacity of health facilities globally. The United Nations estimates that the number of people in the world who are 60 years and above will reach 1 billion by 2050 (United Nations, 2019). Thus, it is becoming a problem for healthcare organizations to deliver medical, psychological, and social care to elderly people.

Integrated, person-centred and interdisciplinary care where services from different healthcare disciplines are involved in the delivery of care has been embraced and recommended as the best model in delivering care to elderly individuals (WHO, 2016). This model of care is most appropriate for elderly patients as they are often presenting with multiple co morbid conditions that require input from a range of practitioners including GPs, geriatricians, nurses, physiotherapists, social workers and others (Barnett et al. , 2012).

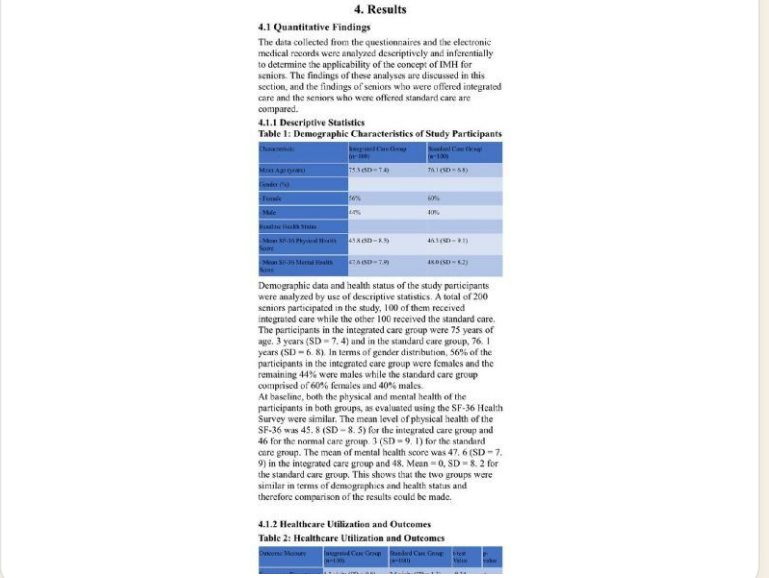
Community-based care, especially rehabilitation and daycare services are different from the conventional hospital-based care and they are more efficient in handling the seniors' health. The existing literature has suggested that integrated community care can improve the health status of the elderly, reduce the hospitalization rate, and enhance the elderly's quality of life (Allen et al., 2014; Dauenhauer et al., 2018). For example, in Singapore, where the percentage of the population of people aged 65 years and above is projected to double by 2030, integrated community care models are now deemed crucial to the sustainability of health care (Ministry of Health Singapore, 2018).

Besides, the integrated care models also address the bio-psycho-social well-being of the seniors with regards to their physical health. This model recognizes that biological, psychological and social factors are implicated in the wellbeing of elders (Engel, 1977). These models also offer a more supportive one that would comprise rehabilitation, mental health, social activities, and family members so that elderly people could have a better quality of life and be able to stay independent (Nicholson et al. , 2017).

1.2 Research Problem

However, there are challenges that affect the integrated multidisciplinary care model and prevent it from being effective and accessible. Some of the challenges that hinder integrated care include; fragmentation of services, lack of co-ordination among the various health care givers, and inadequate funding (Kodner & Spreeuwenberg, 2002). Unfortunately, in many cases, seniors still receive care that is fragmented and limited to certain medical conditions without regard for their complex and interrelated nature (Boult et al., 2009).

However, there is a lack of more comprehensive research


4. Results

4.1 Quantitative Findings

The data collected from the questionnaires and the electronic medical records were analyzed descriptively and inferentially to determine the applicability of the concept of IMH for seniors. The findings of these analyses are discussed in this section, and the findings of seniors who were offered integrated care and the seniors who were offered standard care are compared.

4.1.1 Descriptive Statistics

Table 1: Demographic Characteristics of Study Participants

Characteristic	Integrated Care Group (n=100)	Standard Care Group (n=100)
Mean Age (years)	75.3 (SD = 7.4)	76.1 (SD = 6.8)
Gender (%)		
Female	56%	60%
Male	44%	40%
Baseline Health Status		
Mean SF-36 Physical Health Score	45.8 (SD = 8.5)	46.3 (SD = 9.1)
Mean SF-36 Mental Health Score	47.6 (SD = 7.9)	48.0 (SD = 8.2)

Demographic data and health status of the study participants were analyzed by use of descriptive statistics. A total of 200 seniors participated in the study, 100 of them received integrated care while the other 100 received the standard care. The participants in the integrated care group were 75 years of age. 3 years (SD = 7. 4) and in the standard care group, 76. 1 years (SD = 6. 8). In terms of gender distribution, 56% of the participants in the integrated care group were females and the remaining 44% were males while the standard care group comprised of 60% females and 40% males.

At baseline, both the physical and mental health of the participants in both groups, as evaluated using the SF-36 Health Survey were similar. The mean level of physical health of the SF-36 was 45. 8 (SD = 8. 5) for the integrated care group and 46 for the normal care group. 3 (SD = 9. 1) for the standard care group. The mean of mental health score was 47. 6 (SD = 7. 9) in the integrated care group and 48. Mean = 0, SD = 8. 2 for the standard care group. This shows that the two groups were similar in terms of demographics and health status and therefore comparison of the results could be made.

4.1.2 Healthcare Utilization and Outcomes

Table 2: Healthcare Utilization and Outcomes

Outcome Measure	Integrated Care Group (n=100)	Standard Care Group (n=100)	t-test Value	p-value

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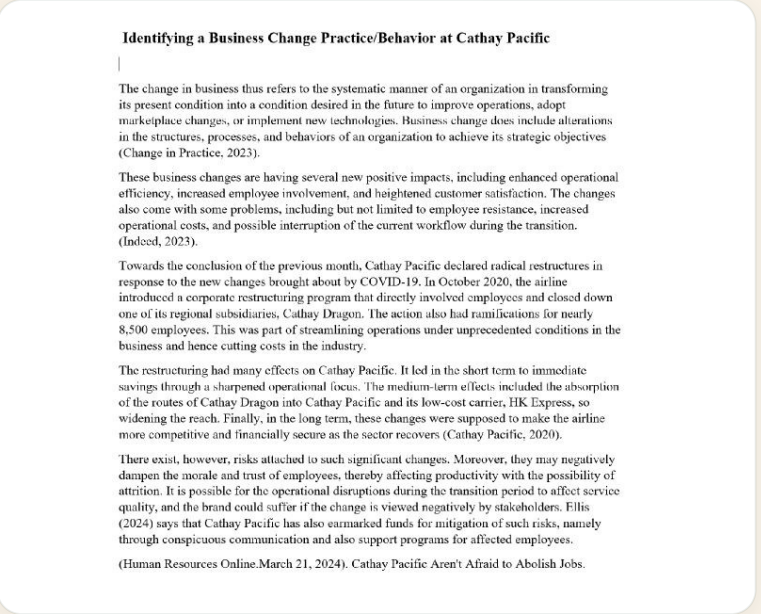


Identifying a Business Change Practice/Behavior at Cathay Pacific

The change in business thus refers to the systematic manner of an organization in transforming its present condition into a condition desired in the future to improve operations, adopt marketplace changes, or implement new technologies. Business change does include alterations in the structures, processes, and behaviors of an organization to achieve its strategic objectives (Change in Practice, 2023).

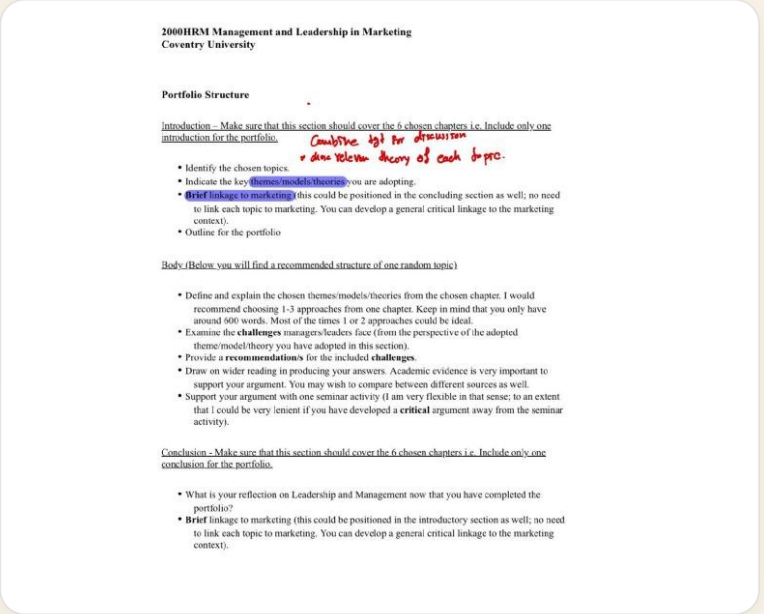
These business changes are having several new positive impacts, including enhanced operational efficiency, increased employee involvement, and heightened customer satisfaction. The changes also come with some problems, including but not limited to employee resistance, increased operational costs, and possible interruption of the current workflow during the transition. (Indeed, 2023).

Towards the conclusion of the previous month, Cathay Pacific declared radical restructures in response to the new changes brought about by COVID-19. In October 2020, the airline introduced a corporate restructuring program that directly involved employees and closed down one of its regional subsidiaries, Cathay Dragon. The action also had ramifications for nearly 8,500 employees. This was part of streamlining operations under unprecedented conditions in the business and hence cutting costs in the industry.

The restructuring had many effects on Cathay Pacific. It led in the short term to immediate savings through a sharpened operational focus. The medium-term effects included the absorption of the routes of Cathay Dragon into Cathay Pacific and its low-cost carrier, HK Express, so widening the reach. Finally, in the long term, these changes were supposed to make the airline more competitive and financially secure as the sector recovers (Cathay Pacific, 2020).

There exist, however, risks attached to such significant changes. Moreover, they may negatively dampen the morale and trust of employees, thereby affecting productivity with the possibility of attrition. It is possible for the operational disruptions during the transition period to affect service quality, and the brand could suffer if the change is viewed negatively by stakeholders. Ellis (2024) says that Cathay Pacific has also earmarked funds for mitigation of such risks, namely through conspicuous communication and also support programs for affected employees.

(Human Resources Online.March 21, 2024). Cathay Pacific Aren't Afraid to Abolish Jobs.



2000HRM Management and Leadership in Marketing
Coventry University

Portfolio Structure

Introduction – Make sure that this section should cover the 6 chosen chapters i.e. Include only one introduction for the portfolio.

- Identify the chosen topics.
- Indicate the key themes/models/theories you are adopting.
- **Brief** linkage to marketing (this could be positioned in the concluding section as well; no need to link each topic to marketing. You can develop a general critical linkage to the marketing context).
- Outline for the portfolio

Body (Below you will find a recommended structure of one random topic)

- Define and explain the chosen themes/models/theories from the chosen chapter. I would recommend choosing 1-3 approaches from one chapter. Keep in mind that you only have around 600 words. Most of the times 1 or 2 approaches could be ideal.
- Examine the **challenges** managers/leaders face (from the perspective of the adopted theme/model/theory you have adopted in this section).
- Provide a **recommendation/s** for the included **challenges**.
- Draw on wider reading in producing your answers. Academic evidence is very important to support your argument. You may wish to compare between different sources as well.
- Support your argument with one seminar activity (I am very flexible in that sense; to an extent that I could be very lenient if you have developed a **critical** argument away from the seminar activity).

Conclusion - Make sure that this section should cover the 6 chosen chapters i.e. Include only one conclusion for the portfolio.

- What is your reflection on Leadership and Management now that you have completed the portfolio?
- **Brief** linkage to marketing (this could be positioned in the introductory section as well; no need to link each topic to marketing. You can develop a general critical linkage to the marketing context).

Amazon and Uber's ethical lapses underscore the importance of balancing profit goals with stakeholder welfare. For any organization to gain stakeholders' confidence and maintain a good reputation for its perpetuation, there is a great need for ethical practices (Ferrell et al., 2021). Business is usually out under trials when ethical issues come up in most situations especially where the industry competition is fierce.

Challenges in Maintaining Business Ethics

Despite its importance, many organizations struggle to uphold ethical standards. Amazon's anti-union efforts and harsh warehouse conditions led to criticism, employee dissatisfaction, and reputational harm. (Palmer, 2020). Practices such as excessive surveillance, unsafe working conditions, and low wages reflect a lack of ethical consideration.

Another example of this sort of culture would be how the "performance-at-all-costs" culture at Uber encouraged the toxic workplace, which seriously tarnished the image of their ethics (Swisher, 2017Ethical mistakes, such as neglecting worker welfare or social responsibilities, lead to reputational damage and legal challenges.

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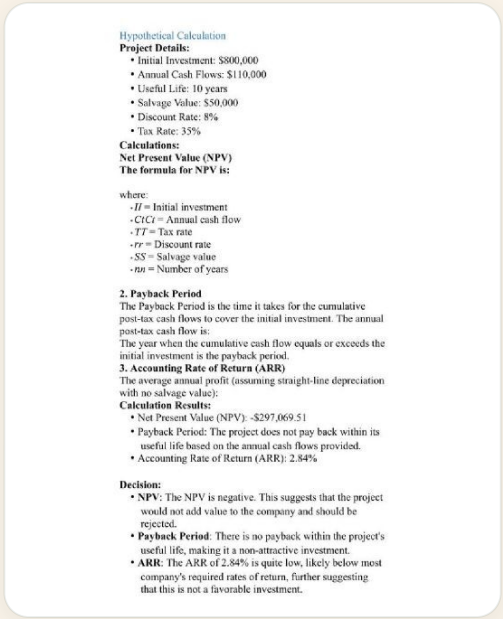
```r
load("Nutrition_data.RData")

str(Nutrition_data)

summary(Nutrition_data)

names(Nutrition_data)

head(Nutrition_data)

# Scatter plot untuk setiap variabel independen
plot(Nutrition_data$`Agriculture, forestry, and fishing, value added (% of GDP)`,
     Nutrition_data$`Percent of population with low food budget`,
     xlab = "Agriculture, forestry, and fishing, value added (% of GDP)",
     ylab = "Percent of population with low food budget",
     main = "Scatter Plot of Agriculture vs Low Food Budget")

plot(Nutrition_data$`Government expenditure on education, total (% of GDP)`,
     Nutrition_data$`Percent of population with low food budget`,
     xlab = "Government expenditure on education, total (% of GDP)",
     ylab = "Percent of population with low food budget",
     main = "Scatter Plot of Education vs Low Food Budget")

plot(Nutrition_data$`Exports of goods and services (% of GDP)`,
     Nutrition_data$`Percent of population with low food budget`,
     xlab = "Exports of goods and services (% of GDP)",
     ylab = "Percent of population with low food budget",
     main = "Scatter Plot of Exports vs Low Food Budget")

plot(Nutrition_data$`GNI per capita, PPP (current intertiol $)`,
     Nutrition_data$`Percent of population with low food budget`,
     xlab = "GNI per capita, PPP (current international $)",
     ylab = "Percent of population with low food budget",
     main = "Scatter Plot of GNI vs Low Food Budget")

plot(Nutrition_data$`Total natural resources rents (% of GDP)`,
     Nutrition_data$`Percent of population with low food budget`,
     xlab = "Total natural resources rents (% of GDP)",
     ylab = "Percent of population with low food budget",
```



Hypothetical Calculation

Project Details:

- Initial Investment: $800,000
- Annual Cash Flows: $110,000
- Useful Life: 10 years
- Salvage Value: $50,000
- Discount Rate: 8%
- Tax Rate: 35%

Calculations:

Net Present Value (NPV)

The formula for NPV is:

where:

- I = Initial investment
- $CtCt$ = Annual cash flow
- TT = Tax rate
- rr = Discount rate
- SS = Salvage value
- nn = Number of years

2. Payback Period

The Payback Period is the time it takes for the cumulative post-tax cash flows to cover the initial investment. The annual post-tax cash flow is:

The year when the cumulative cash flow equals or exceeds the initial investment is the payback period.

3. Accounting Rate of Return (ARR)

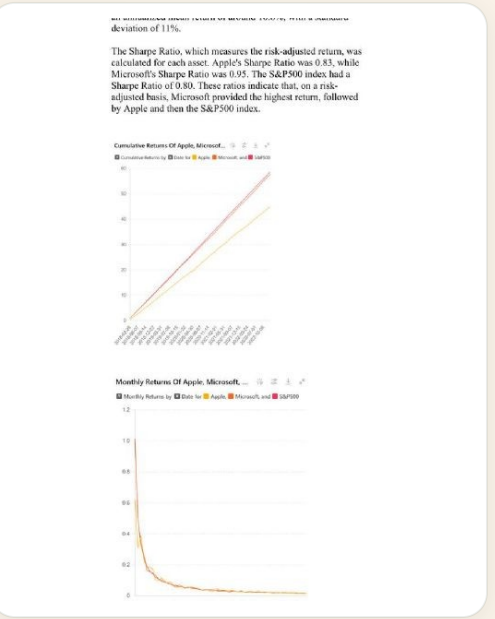
The average annual profit (assuming straight-line depreciation with no salvage value):

Calculation Results:

- Net Present Value (NPV): -$297,069.51
- Payback Period: The project does not pay back within its useful life based on the annual cash flows provided.
- Accounting Rate of Return (ARR): 2.84%

Decision:

- **NPV**: The NPV is negative. This suggests that the project would not add value to the company and should be rejected.
- **Payback Period**: There is no payback within the project's useful life, making it a non-attractive investment.
- **ARR**: The ARR of 2.84% is quite low, likely below most company's required rates of return, further suggesting that this is not a favorable investment.

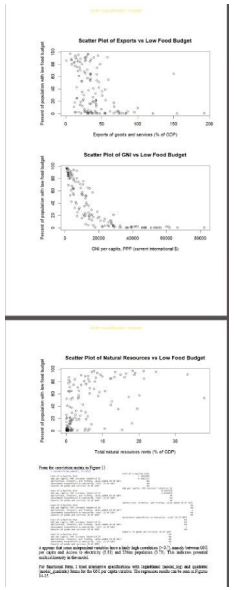


deviation of 11%.

The Sharpe Ratio, which measures the risk-adjusted return, was calculated for each asset. Apple's Sharpe Ratio was 0.83, while Microsoft's Sharpe Ratio was 0.95. The S&P500 index had a Sharpe Ratio of 0.80. These ratios indicate that, on a risk-adjusted basis, Microsoft provided the highest return, followed by Apple and then the S&P500 index.

Cumulative Returns Of Apple, Microsoft, ...

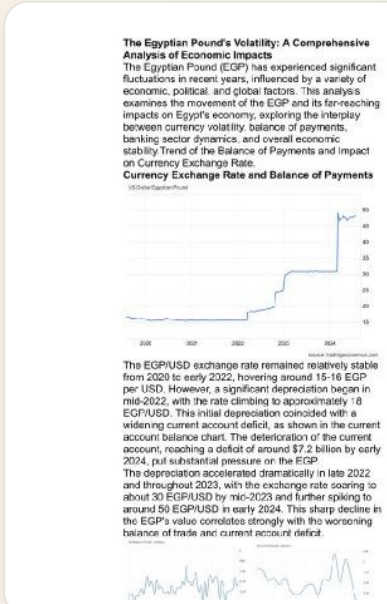
Monthly Returns Of Apple, Microsoft, ...



Scatter Plot of Exports vs Low Food Budget

Scatter Plot of GNI vs Low Food Budget

Scatter Plot of Natural Resources vs Low Food Budget



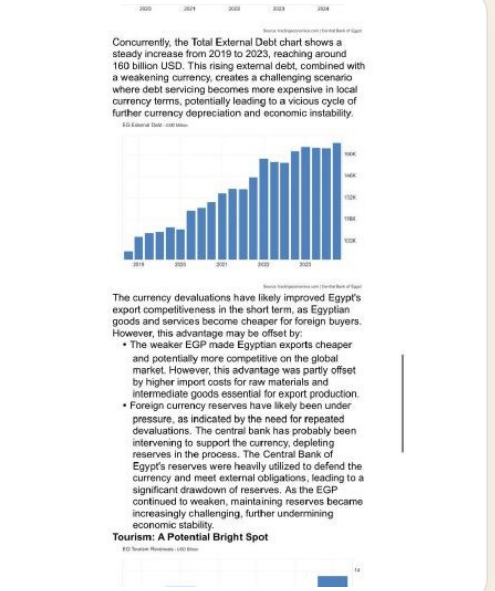
The Egyptian Pound's Volatility: A Comprehensive Analysis of Economic Impacts

The Egyptian Pound (EGP) has experienced significant fluctuations in recent years, influenced by a variety of economic, political, and global factors. This analysis examines the movement of the EGP and its far-reaching impacts on Egypt's economy, exploring the interplay between currency volatility, balance of payments, banking sector dynamics, and overall economic stability.Trend of the Balance of Payments and Impact on Currency Exchange Rate.

Currency Exchange Rate and Balance of Payments

The EGP/USD exchange rate remained relatively stable from 2020 to early 2022, hovering around 15-16 EGP per USD. However, a significant depreciation began in mid-2022, with the rate climbing to aproximately 18 EGP/USD. This initial depreciation coincided with a widening current account deficit, as shown in the current account balance chart. The deterioration of the current account, reaching a deficit of around $7.2 billion by early 2024, put substantial pressure on the EGP.

The depreciation accelerated dramatically in late 2022 and throughout 2023, with the exchange rate soaring to about 30 EGP/USD by mid-2023 and further spiking to around 50 EGP/USD in early 2024. This sharp decline in the EGP's value correlates strongly with the worsening balance of trade and current account deficit.



Concurrently, the Total External Debt chart shows a steady increase from 2019 to 2023, reaching around 160 billion USD. This rising external debt, combined with a weakening currency, creates a challenging scenario where debt servicing becomes more expensive in local currency terms, potentially leading to a vicious cycle of further currency depreciation and economic instability.

The currency devaluations have likely improved Egypt's export competitiveness in the short term, as Egyptian goods and services become cheaper for foreign buyers. However, this advantage may be offset by:

- The weaker EGP made Egyptian exports cheaper and potentially more competitive on the global market. However, this advantage was partly offset by higher import costs for raw materials and intermediate goods essential for export production.
- Foreign currency reserves have likely been under pressure, as indicated by the need for repeated devaluations. The central bank has probably been intervening to support the currency, depleting reserves in the process. The Central Bank of Egypt's reserves were heavily utilized to defend the currency and meet external obligations, leading to a significant drawdown of reserves. As the EGP continued to weaken, maintaining reserves became increasingly challenging, further undermining economic stability.

Tourism: A Potential Bright Spot

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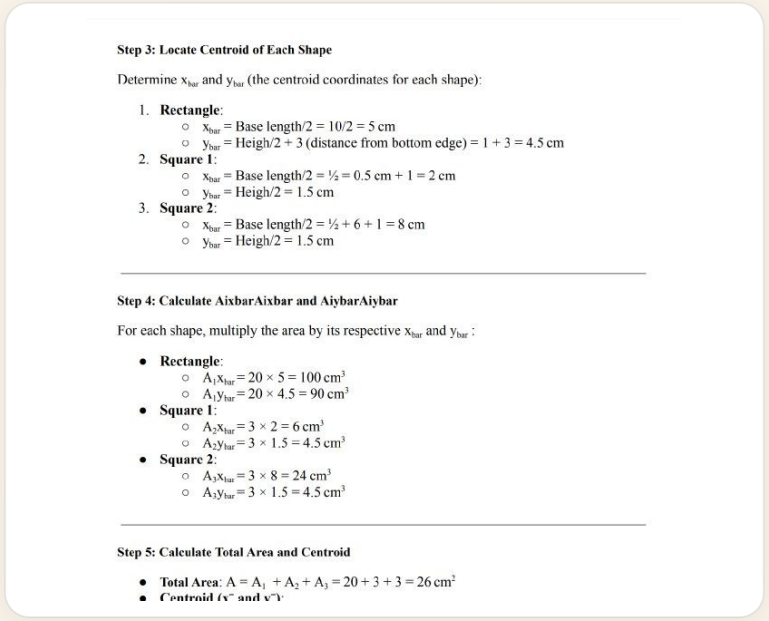


Step 3: Locate Centroid of Each Shape

Determine x_{bar} and y_{bar} (the centroid coordinates for each shape):

1. **Rectangle**:
   - x_{bar} = Base length/2 = 10/2 = 5 cm
   - y_{bar} = Heigh/2 + 3 (distance from bottom edge) = 1 + 3 = 4.5 cm
2. **Square 1**:
   - x_{bar} = Base length/2 = ½ = 0.5 cm + 1 = 2 cm
   - y_{bar} = Heigh/2 = 1.5 cm
3. **Square 2**:
   - x_{bar} = Base length/2 = ½ + 6 + 1 = 8 cm
   - y_{bar} = Heigh/2 = 1.5 cm

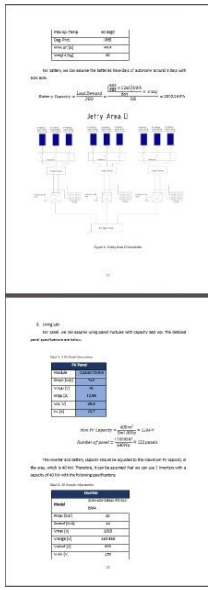
Step 4: Calculate AixbarAixbar and AiybarAiybar

For each shape, multiply the area by its respective x_{bar} and y_{bar} :

- **Rectangle**:
  - $A_1x_{bar} = 20 \times 5 = 100\ cm^3$
  - $A_1y_{bar} = 20 \times 4.5 = 90\ cm^3$
- **Square 1**:
  - $A_2x_{bar} = 3 \times 2 = 6\ cm^3$
  - $A_2y_{bar} = 3 \times 1.5 = 4.5\ cm^3$
- **Square 2**:
  - $A_3x_{bar} = 3 \times 8 = 24\ cm^3$
  - $A_3y_{bar} = 3 \times 1.5 = 4.5\ cm^3$

Step 5: Calculate Total Area and Centroid

- **Total Area**: $A = A_1 + A_2 + A_3 = 20 + 3 + 3 = 26\ cm^2$
- **Centroid (x^- and y^-)**:



Refer to the circuit shown in Figure 3. Design the circuit such that the:

- Voltage across R_L , V_{RL} is 9.5 V
  [Refer to Annex A for your assigned value of V_{RL}].

Solve V_{RL} **using Thevenin Theorem**. Show your workings in the space below and input the values of the various variables in the table below. Do note that the values of the variables should be of realistic values.

Variable	Value	Unit
Resistor R_1		Ω
Resistor R_2		Ω
Resistor R_3		Ω
Resistor R_4		Ω
Resistor R_L		Ω
Voltage across R_L V_{RL}	9.5	V

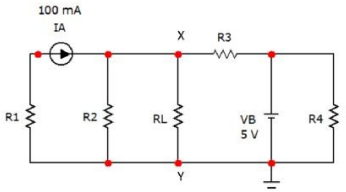


Figure 3

a) View from terminal X-Y at the load, R_L, redraw the circuit in Figure 3 to find Thevenin's Resistance, R_{TH}.

b) View from terminal X-Y at the load, R_L, redraw the circuit in Figure 3 to find Thevenin's Voltage, V_{TH}. After redrawing the circuit, **use Superposition Theorem** to help you solve V_{TH}.

c) Draw the Thevenin's equivalent circuit with R_{TH} connected.

d) Calculate R_L so that you met the design requirement of your assigned V_{RL}.

Part (a): Finding Thevenin's Resistance (RTHR_{TH}RTH)

- Remove RLR_LRL: Disconnect RLR_LRL at terminals X−YX-YX−Y.
- Short-circuit the voltage source (VB=5 VV_B = 5\, \text{V}VB=5V): Replace it with a wire.
- Open-circuit the current source (100 mA100\, \text{mA}100mA): Treat it as an open circuit.

Equivalent circuit for resistance:

- R_3 and R_4 are in series.
- Combine R_3 and R_4:

$$R_{34} = R_3 + R_4$$

- R_{34} is in parallel with R_2:

$$R_{234} = \frac{R_2 \cdot R_{34}}{R_2 + R_{34}}$$

- Finally, R_{234} is in series with R_1:

$$R_{TH} = R_1 + R_{234}$$

Part (b): Finding Thevenin's Voltage (VTHV_{TH}VTH)

- Open-circuit RLR_LRL: Remove RLR_LRL at terminals X−YX-YX−Y to calculate the open-circuit voltage (VTHV_{TH}VTH).
- Use Superposition Theorem: Calculate VTHV_{TH}VTH due to each source independently.

Step 1: Contribution from the 100mA Current Source

$$V_{34,I} = \frac{R_{34}}{R_{34} + R_2} \cdot (100\,\text{mA}) \cdot R_{34}$$

Step 2: Contribution from the 5V Voltage Source

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Nursing Care Education Essay: Problem-Based Learning (PBL) Framework for Nursing Education

Introduction

Problem-Based Learning (PBL) has emerged as the cornerstone of innovative teaching strategies in nursing education for fostering critical thinking, clinical reasoning, and problemsolving skills. Competencies that are considered essential in the preparation of nursing students for the complexities of real-world healthcare environments, which require multidisciplinary collaboration, a patient-centered approach to care, and ethical decision-making. PBL acts as a bridge between nursing education, now shifting toward active learning and learner-centered approaches, and the application of theoretical knowledge in clinical practice.

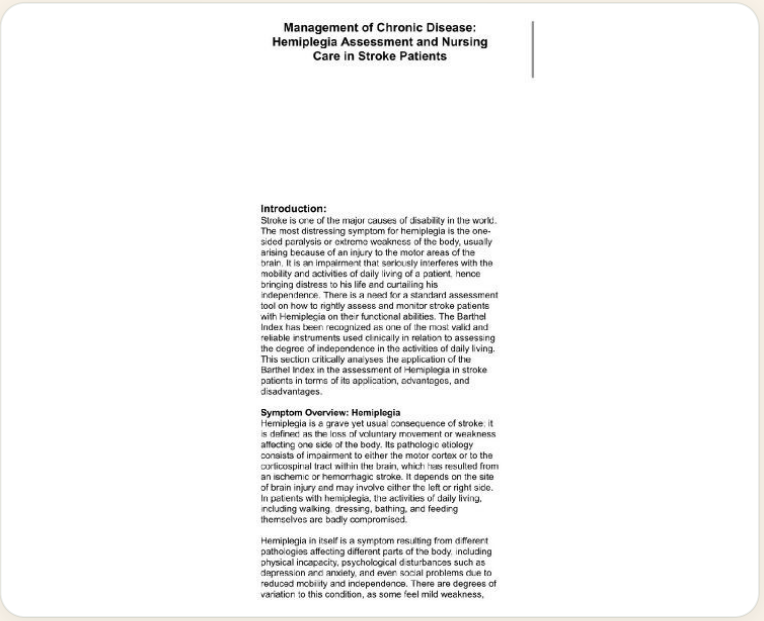
The following essay provides a detailed PBL framework for nursing students to help professionalize their lack of competencies regarding patient-centered care in complex healthcare settings. The intended learners are clearly profiled in the framework, training needs analysis is provided, the readiness of the learners for PBL, and subject focus. It also emphasizes anchoring goals and sub-goals of the PBL framework, an engaging problem scenario, structured template to apply it, a facilitator guide, resource accessibility, and an evaluative marking scheme for assessment. This essay places the PDL framework in its rightful position as a game-changing educational pedagogy that furnishes nursing students with the competencies, understanding, and disposition necessary to function effectively within their scope of practice.

Profile of Learners

The target learners for this problem-based learning framework are final-year undergraduate nursing students who are about to be released into the healthcare workforce. The students will have completed some foundation courses in the areas of anatomy, physiology, pharmacology, and nursing interventions. They will also have undergone clinical placement facilities that are guided, where the students observe and practice simple nursing skills in the natural environment.

However, their preparedness to make the leap from regimented academic learning into independent professional practice is variable. Some students are quite confident and competent in this regard, whereas others struggle to synthesize theoretical knowledge into complex, patient-centered scenarios. These learners themselves are very diverse, ranging across academic ability, cultural backgrounds, and personal experiences with active learning pedagogies. The framework, therefore, takes such variations into account, catering to different learning styles to ensure inclusivity and equity.

Statement of Training Needs Assessment



Management of Chronic Disease: Hemiplegia Assessment and Nursing Care in Stroke Patients

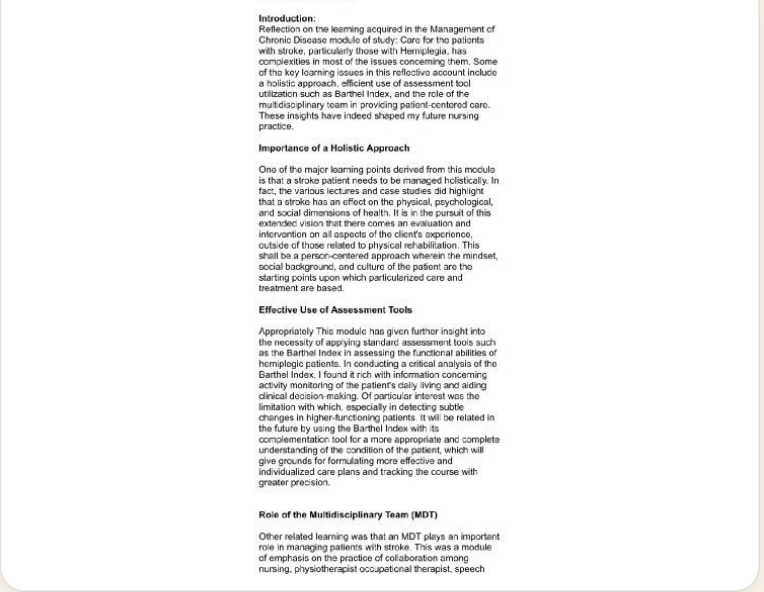
Introduction:

Stroke is one of the major causes of disability in the world. The most distressing symptom for hemiplegia is the one-sided paralysis or extreme weakness of the body, usually arising because of an injury to the motor areas of the brain. It is an impairment that seriously interferes with the mobility and activities of daily living of a patient, hence bringing distress to his life and curtailing his independence. There is a need for a standard assessment tool on how to rightly assess and monitor stroke patients with Hemiplegia on their functional abilities. The Barthel Index has been recognized as one of the most valid and reliable instruments used clinically in relation to assessing the degree of independence in the activities of daily living. This section critically analyses the application of the Barthel Index in the assessment of Hemiplegia in stroke patients in terms of its application, advantages, and disadvantages.

Symptom Overview: Hemiplegia

Hemiplegia is a grave yet usual consequence of stroke: it is defined as the loss of voluntary movement or weakness affecting one side of the body. Its pathologic etiology consists of impairment to either the motor cortex or to the corticospinal tract within the brain, which has resulted from an ischemic or hemorrhagic stroke. It depends on the site of brain injury and may involve either the left or right side. In patients with hemiplegia, the activities of daily living, including walking, dressing, bathing, and feeding themselves are badly compromised.

Hemiplegia in itself is a symptom resulting from different pathologies affecting different parts of the body, including physical incapacity, psychological disturbances such as depression and anxiety, and even social problems due to reduced mobility and incependence. There are degrees of variation to this condition, as some feel mild weakness,



Reflective Account

Introduction:

Reflection on the learning acquired in the Management of Chronic Disease module of study: Care for the patients with stroke, particularly those with Hemiplegia, has complexities in most of the issues concerning them. Some of the key learning issues in this reflective account include a holistic approach, efficient use of assessment tool utilization such as Barthel Index, and the role of the multidisciplinary team in provicing patient-centered care. These insights have indeed shaped my future nursing practice.

Importance of a Holistic Approach

One of the major learning points derived from this modula is that a stroke patient needs to be managed holistically. In fact, the various lectures and case studies did highlight that a stroke has an effect on the physical, psychological, and social dimensions of health. It is in the pursuit of this extended vision that there comes an evaluation and intervention on all aspects of the client's experience, outside of those related to physical rehabilitation. This shall be a person-centered approach wherein the mindset, social background, and culture of the patient are the starting points upon which particularized care and treatment are based.

Effective Use of Assessment Tools

Appropriately This module has given further insight into the necessity of applying standard assessment tools such as the Barthel Index in assessing the functional abilities of hemiplegic patients. In conducting a critical analysis of the Barthel Index, I found it rich with information concerning activity monitoring of the patient's daily living and aiding clinical decision-making. Of particular interest was the limitation with which, especially in detecting subtle changes in higher-functioning patients. It will be related in the future by using the Barthel Index with its complementation tool for a more appropriate and complete understanding of the condition of the patient, which will give grounds for formulating more effective and individualized care plans and tracking the course with greater precision.

Role of the Multidisciplinary Team (MDT)

Other related learning was that an MDT plays an important role in managing patients with stroke. This was a module of emphasis on the practice of collaboration among nursing, physiotherapist occupational therapist, speech

OUR WORK

PROGRAMMING TASKS

Python & KNIME

Scripts, data pipelines & workflow models

✦ coded by a real human

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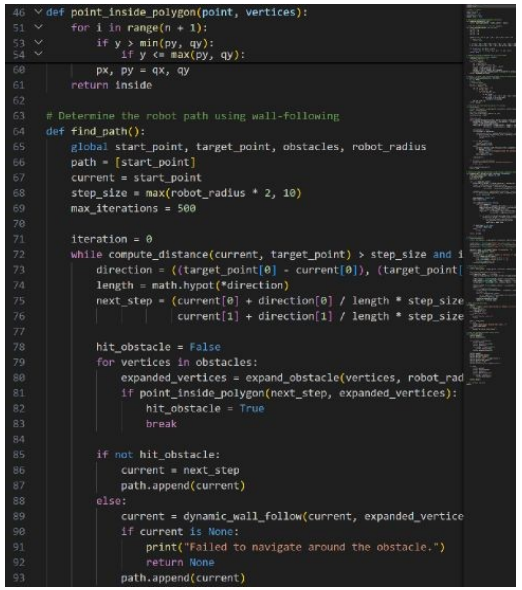
Proficient & fluent across every syllabus.



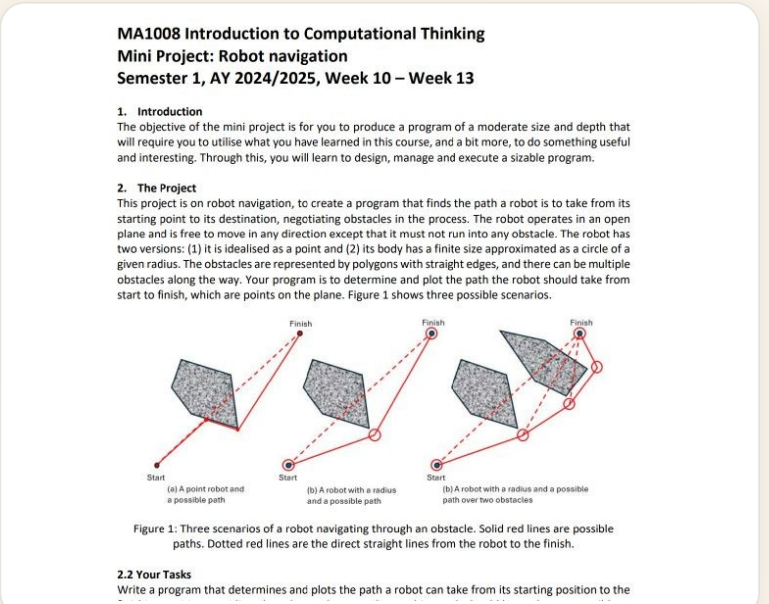
```python
def point_inside_polygon(point, vertices):
    for i in range(n + 1):
        if y > min(py, qy):
            if y <= max(py, qy):
        px, py = qx, qy
    return inside

# Determine the robot path using wall-following
def find_path():
    global start_point, target_point, obstacles, robot_radius
    path = [start_point]
    current = start_point
    step_size = max(robot_radius * 2, 10)
    max_iterations = 500

    iteration = 0
    while compute_distance(current, target_point) > step_size and i
        direction = ((target_point[0] - current[0]), (target_point[
        length = math.hypot(*direction)
        next_step = (current[0] + direction[0] / length * step_size
                     current[1] + direction[1] / length * step_size

        hit_obstacle = False
        for vertices in obstacles:
            expanded_vertices = expand_obstacle(vertices, robot_rad
            if point_inside_polygon(next_step, expanded_vertices):
                hit_obstacle = True
                break

        if not hit_obstacle:
            current = next_step
            path.append(current)
        else:
            current = dynamic_wall_follow(current, expanded_vertice
            if current is None:
                print("Failed to navigate around the obstacle.")
                return None
            path.append(current)
```



MA1008 Introduction to Computational Thinking
Mini Project: Robot navigation
Semester 1, AY 2024/2025, Week 10 – Week 13

1. Introduction

The objective of the mini project is for you to produce a program of a moderate size and depth that will require you to utilise what you have learned in this course, and a bit more, to do something useful and interesting. Through this, you will learn to design, manage and execute a sizable program.

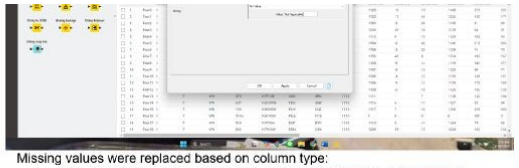
2. The Project

This project is on robot navigation, to create a program that finds the path a robot is to take from its starting point to its destination, negotiating obstacles in the process. The robot operates in an open plane and is free to move in any direction except that it must not run into any obstacle. The robot has two versions: (1) it is idealised as a point and (2) its body has a finite size approximated as a circle of a given radius. The obstacles are represented by polygons with straight edges, and there can be multiple obstacles along the way. Your program is to determine and plot the path the robot should take from start to finish, which are points on the plane. Figure 1 shows three possible scenarios.

Figure 1: Three scenarios of a robot navigating through an obstacle. Solid red lines are possible paths. Dotted red lines are the direct straight lines from the robot to the finish.

2.2 Your Tasks

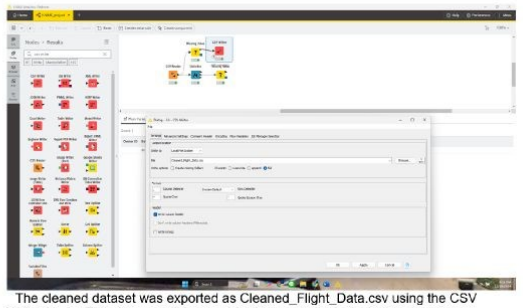
Write a program that determines and plots the path a robot can take from its starting position to the



Missing values were replaced based on column type:

- Numerical columns like ELAPSED_TIME and ARRIVAL_DELAY were replaced with 0, representing no valid delay or time recorded.
- Categorical columns like TAIL_NUMBER were replaced with "Not Applicable" to retain the dataset structure without removing rows.

c. Saving The Cleaned Dataset



The cleaned dataset was exported as Cleaned_Flight_Data.csv using the CSV Writer Node. This dataset will be used for further analysis, including exploratory data analysis (EDA) and visualizations.

OUR WORK

PROGRAMMING TASKS

Data Analytics

Analysis, visualisation & modelling

✦ *coded by a real human*

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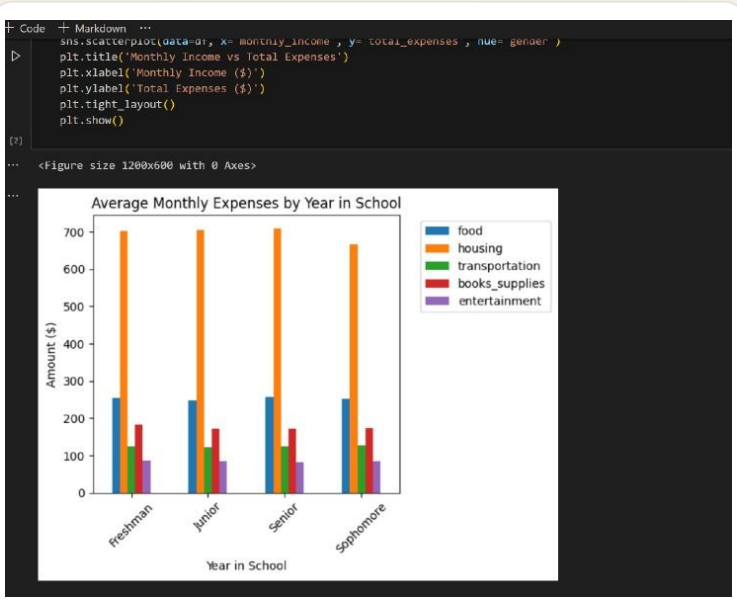

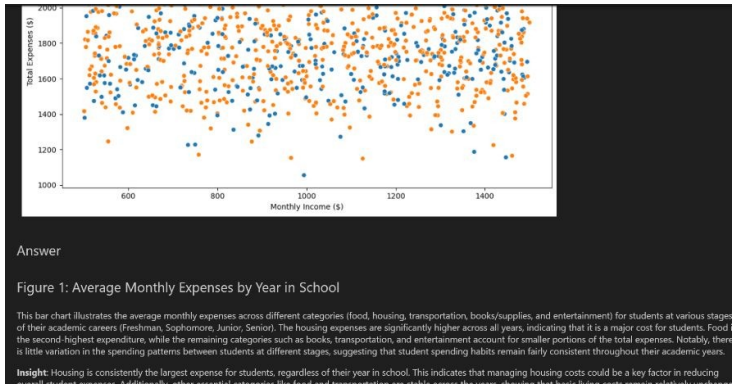

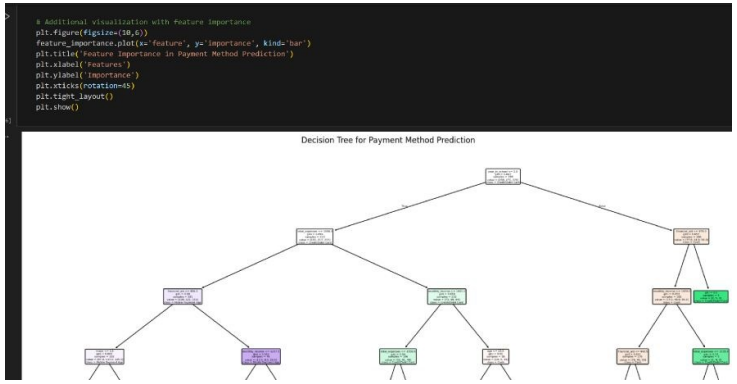

OUR WORK

PROGRAMMING TASKS

Excel VBA & Power Automate

Macros, automation & dashboards

✦ *coded by a real human*

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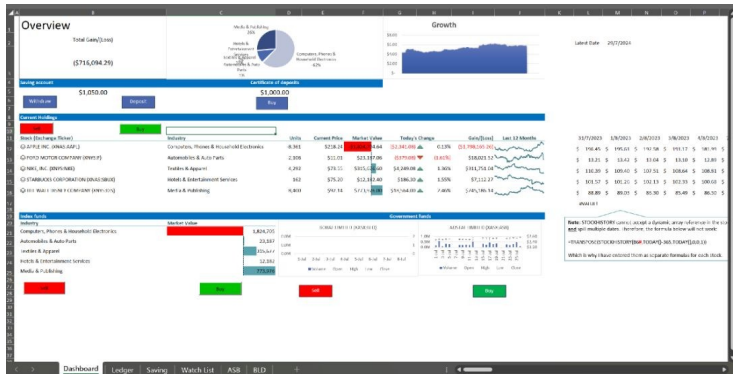
Proficient & fluent across every syllabus.



procedures.

Data Operation

1. **Compose**
   Usage: Combines multiple data points into a single formatted message or document.
   Configuration: Streamlines the creation of documentation and reports, ensuring consistency and accuracy.
   Example: Compose a summary report of test results, including pass/fail status and key metrics.
2. **Concatenate**
   Usage: Joins strings or variables, often used for creating filenames or structured messages.
   Configuration: Reduces manual effort and errors in data handling, particularly for repetitive tasks.
   Example: Concatenate the project name and date to generate a unique log file name.
3. **Variables**
   Usage: Stores data that can be reused throughout the flow, such as counters, flags, or dynamic content.
   Configuration: Enhances the flow's flexibility and adaptability, enabling more complex logic and operations.
   Example: Use a variable to keep track of the number of failed builds in a sequence.

Approval Process

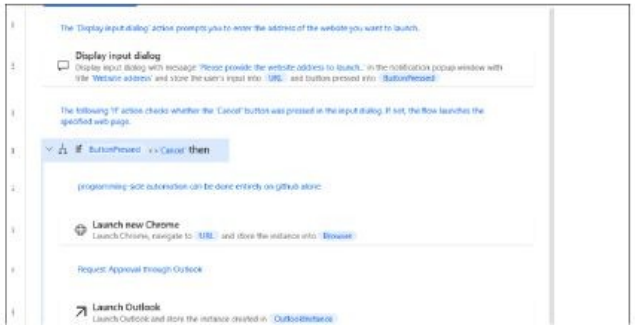
Approval Process Mechanism

- Usage: Implements a formal approval mechanism before deploying code to production or executing critical actions.
- Configuration: Use the "Start an Approval" action to send approval requests via Outlook or Teams.
- Example: "Require deployment approval from the project manager and QA lead before proceeding to the production environment."
- Impact: Ensures that all critical actions are reviewed and approved, reducing the risk of unauthorized changes and enhancing accountability.

Power Automate

- Usage: Monitors the status of flows, manages approvals, and tracks progress from mobile devices.
- Configuration: Set up the app with relevant dashboards and notifications for real-time monitoring.
- Example: "Use the Power Automate app to approve deployment requests and monitor flow execution on the go."
- Impact: Enhances responsiveness and flexibility, allowing managers and team members to stay informed and make decisions anywhere.

6



OUR WORK

PROGRAMMING TASKS

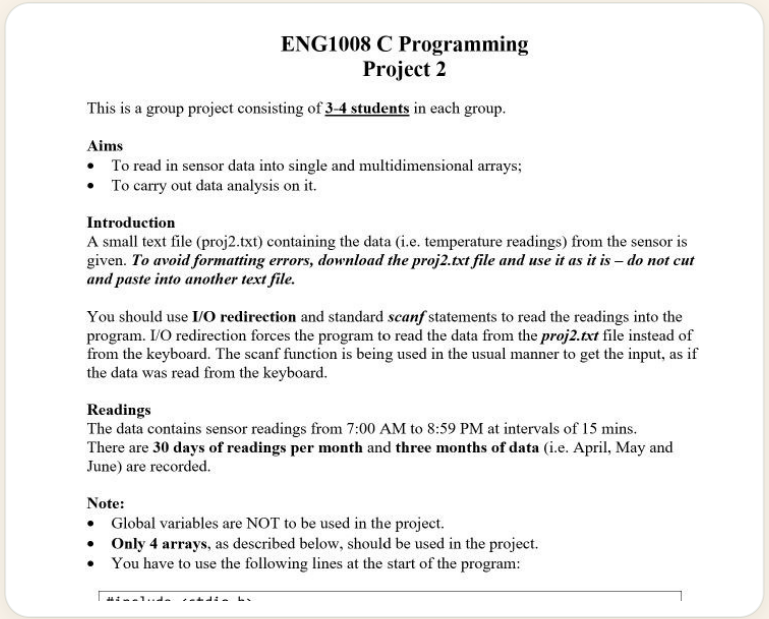
C / C++ Programming

Projects, data structures & UML design

✦ *coded by a real human*

TOP GRADUATES FROM NUS · NTU · SMU · SUSS · SIM

Proficient & fluent across every syllabus.



ENG1008 C Programming
Project 2

This is a group project consisting of **3-4 students** in each group.

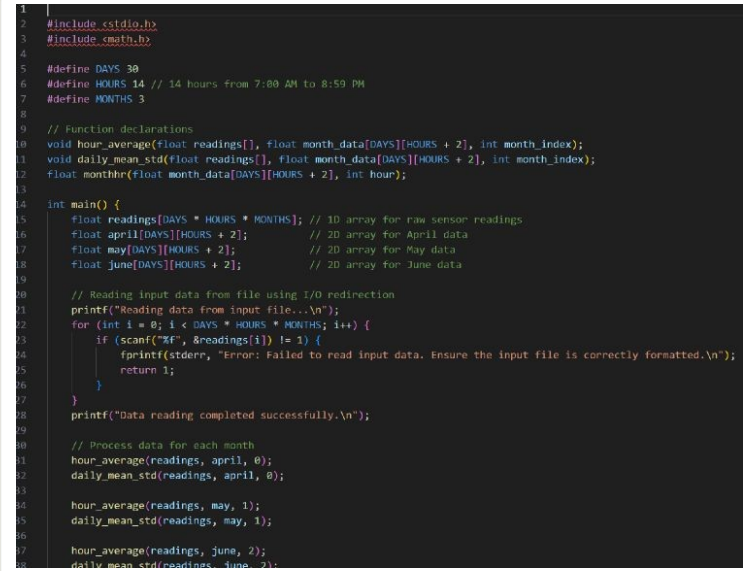
Aims
- To read in sensor data into single and multidimensional arrays;
- To carry out data analysis on it.

Introduction
A small text file (proj2.txt) containing the data (i.e. temperature readings) from the sensor is given. ***To avoid formatting errors, download the proj2.txt file and use it as it is – do not cut and paste into another text file.***

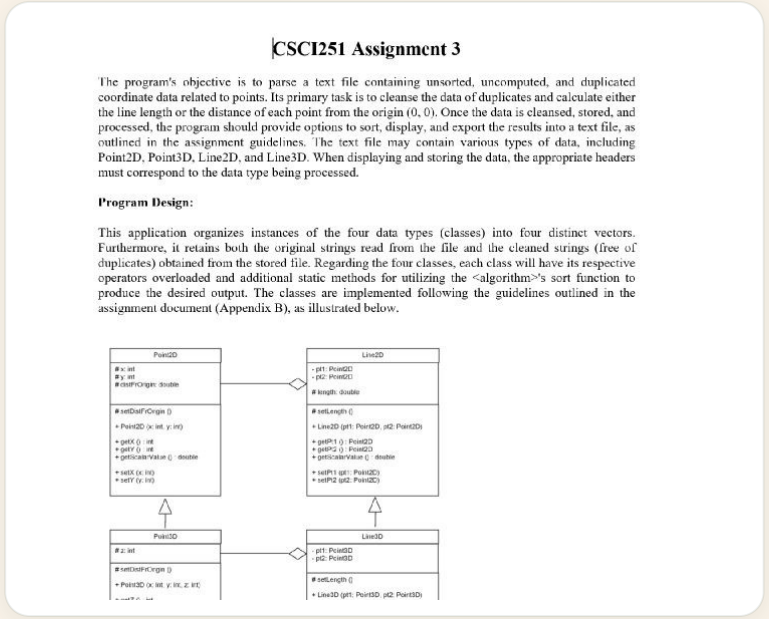
You should use **I/O redirection** and standard ***scanf*** statements to read the readings into the program. I/O redirection forces the program to read the data from the ***proj2.txt*** file instead of from the keyboard. The scanf function is being used in the usual manner to get the input, as if the data was read from the keyboard.

Readings
The data contains sensor readings from 7:00 AM to 8:59 PM at intervals of 15 mins. There are **30 days of readings per month** and **three months of data** (i.e. April, May and June) are recorded.

Note:
- Global variables are NOT to be used in the project.
- **Only 4 arrays**, as described below, should be used in the project.
- You have to use the following lines at the start of the program:



```c
#include <stdio.h>
#include <math.h>

#define DAYS 30
#define HOURS 14 // 14 hours from 7:00 AM to 8:59 PM
#define MONTHS 3

// Function declarations
void hour_average(float readings[], float month_data[DAYS][HOURS + 2], int month_index);
void daily_mean_std(float readings[], float month_data[DAYS][HOURS + 2], int month_index);
float monthhr(float month_data[DAYS][HOURS + 2], int hour);

int main() {
    float readings[DAYS * HOURS * MONTHS]; // 1D array for raw sensor readings
    float april[DAYS][HOURS + 2];          // 2D array for April data
    float may[DAYS][HOURS + 2];            // 2D array for May data
    float june[DAYS][HOURS + 2];           // 2D array for June data

    // Reading input data from file using I/O redirection
    printf("Reading data from input file...\n");
    for (int i = 0; i < DAYS * HOURS * MONTHS; i++) {
        if (scanf("%f", &readings[i]) != 1) {
            fprintf(stderr, "Error: Failed to read input data. Ensure the input file is correctly formatted.\n");
            return 1;
        }
    }
    printf("Data reading completed successfully.\n");

    // Process data for each month
    hour_average(readings, april, 0);
    daily_mean_std(readings, april, 0);

    hour_average(readings, may, 1);
    daily_mean_std(readings, may, 1);

    hour_average(readings, june, 2);
    daily_mean_std(readings, june, 2);
```



CSCI251 Assignment 3

The program's objective is to parse a text file containing unsorted, uncomputed, and duplicated coordinate data related to points. Its primary task is to cleanse the data of duplicates and calculate either the line length or the distance of each point from the origin (0, 0). Once the data is cleansed, stored, and processed, the program should provide options to sort, display, and export the results into a text file, as outlined in the assignment guidelines. The text file may contain various types of data, including Point2D, Point3D, Line2D, and Line3D. When displaying and storing the data, the appropriate headers must correspond to the data type being processed.

Program Design:

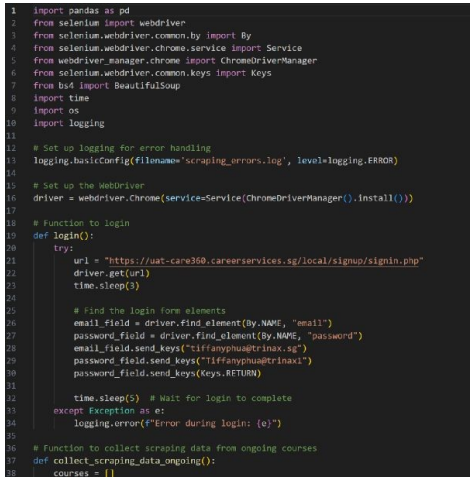
This application organizes instances of the four data types (classes) into four distinct vectors. Furthermore, it retains both the original strings read from the file and the cleaned strings (free of duplicates) obtained from the stored file. Regarding the four classes, each class will have its respective operators overloaded and additional static methods for utilizing the <algorithm>'s sort function to produce the desired output. The classes are implemented following the guidelines outlined in the assignment document (Appendix B), as illustrated below.

OUR WORK

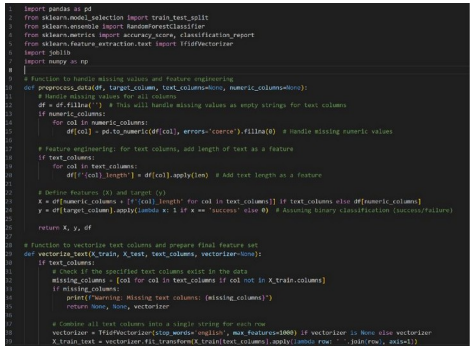
PROGRAMMING TASKS

Machine Learning

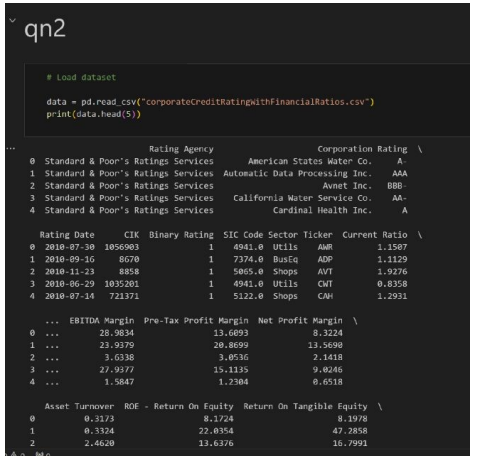
Models, training pipelines & evaluation



```python
import pandas as pd
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.chrome.service import Service
from webdriver_manager.chrome import ChromeDriverManager
from selenium.webdriver.common.keys import Keys
from bs4 import BeautifulSoup
import time
import os
import logging

# Set up logging for error handling
logging.basicConfig(filename='scraping_errors.log', level=logging.ERROR)

# Set up the WebDriver
driver = webdriver.Chrome(service=Service(ChromeDriverManager().install()))

# Function to login
def login():
    try:
        url = "https://uat-care360.careerservices.sg/local/signup/signin.php"
        driver.get(url)
        time.sleep(3)

        # Find the login form elements
        email_field = driver.find_element(By.NAME, "email")
        password_field = driver.find_element(By.NAME, "password")
        email_field.send_keys("tiffanyphua@trinax.sg")
        password_field.send_keys("TIffanyphua@trinax1")
        password_field.send_keys(Keys.RETURN)

        time.sleep(5)  # Wait for login to complete
    except Exception as e:
        logging.error(f"Error during login: {e}")

# Function to collect scraping data from ongoing courses
def collect_scraping_data_ongoing():
    courses = []
```



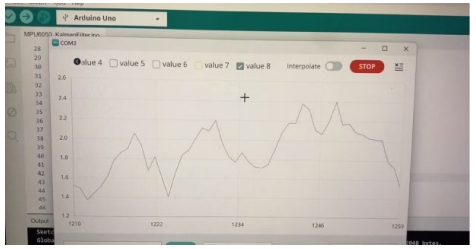
```python
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, classification_report
from sklearn.feature_extraction.text import TfidfVectorizer
import joblib
import numpy as np

# Function to handle missing values and feature engineering
def preprocess_data(df, target_column, text_columns=None, numeric_columns=None):
    # Handle missing values for all columns
    df = df.fillna('')  # This will handle missing values as empty strings for text columns
    if numeric_columns:
        for col in numeric_columns:
            df[col] = pd.to_numeric(df[col], errors='coerce').fillna(0)  # Handle missing numeric values

    # Feature engineering: for text columns, add length of text as a feature
    if text_columns:
        for col in text_columns:
            df[f'{col}_length'] = df[col].apply(len)  # Add text length as a feature

    # Define features (X) and target (y)
    X = df[numeric_columns + [f'{col}_length' for col in text_columns]] if text_columns else df[numeric_columns]
    y = df[target_column].apply(lambda x: 1 if x == 'success' else 0)  # Assuming binary classification (success/failure)

    return X, y, df

# Function to vectorize text columns and prepare final feature set
def vectorize_text(X_train, X_test, text_columns, vectorizer=None):
    if text_columns:
        # Check if the specified text columns exist in the data
        missing_columns = [col for col in text_columns if col not in X_train.columns]
        if missing_columns:
            print(f"Warning: Missing text columns: {missing_columns}")
            return None, None, vectorizer

        # Combine all text columns into a single string for each row
        vectorizer = TfidfVectorizer(stop_words='english', max_features=1000) if vectorizer is None else vectorizer
        X_train_text = vectorizer.fit_transform(X_train[text_columns].apply(lambda row: ' '.join(row), axis=1))
```

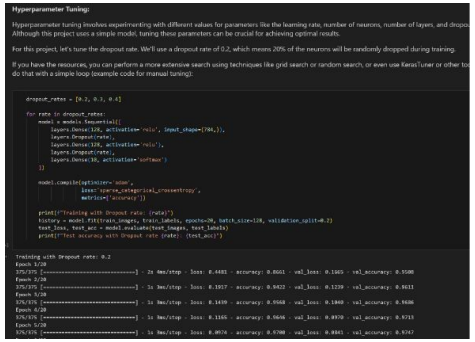


qn2

```python
# Load dataset

data = pd.read_csv("corporateCreditRatingWithFinancialRatios.csv")
print(data.head(5))
```

```
                                Rating Agency                      Corporation Rating  \
0  Standard & Poor's Ratings Services       American States Water Co.      A-
1  Standard & Poor's Ratings Services  Automatic Data Processing Inc.    AAA
2  Standard & Poor's Ratings Services                  Avnet Inc.   BBB-
3  Standard & Poor's Ratings Services  California Water Service Co.    AA-
4  Standard & Poor's Ratings Services           Cardinal Health Inc.      A

  Rating Date      CIK  Binary Rating  SIC Code Sector Ticker  Current Ratio  \
0  2010-07-30  1056903              1    4941.0  Utils    AWR         1.1507
1  2010-09-16     8670              1    7374.0  BusEq    ADP         1.1129
2  2010-11-23     8858              1    5065.0  Shops    AVT         1.9276
3  2010-06-29  1035201              1    4941.0  Utils    CWT         0.8358
4  2010-07-14   721371              1    5122.0  Shops    CAH         1.2931

   ...  EBITDA Margin  Pre-Tax Profit Margin  Net Profit Margin  \
0  ...        28.9834                13.6093             8.3224
1  ...        23.9379                20.8699            13.5690
2  ...         3.6338                 3.0536             2.1418
3  ...        27.9377                15.1135             9.0246
4  ...         1.5847                 1.2304             0.6518

   Asset Turnover  ROE - Return On Equity  Return On Tangible Equity  \
0          0.3173                  8.1724                     9.1978
1          0.3324                 22.0354                    47.2858
2          2.4620                 13.6376                    16.7991
```





Hyperparameter Tuning:

Hyperparameter tuning involves experimenting with different values for parameters like the learning rate, number of neurons, number of layers, and dropou... Although this project uses a simple model, tuning these parameters can be crucial for achieving optimal results.

For this project, let's tune the dropout rate. We'll use a dropout rate of 0.2, which means 20% of the neurons will be randomly dropped during training.

If you have the resources, you can perform a more extensive search using techniques like grid search or random search, or even use KerasTuner or other too... do that with a simple loop (example code for manual tuning):

```python
dropout_rates = [0.2, 0.3, 0.4]

for rate in dropout_rates:
    model = models.Sequential([
        layers.Dense(128, activation='relu', input_shape=(784,)),
        layers.Dropout(rate),
        layers.Dense(128, activation='relu'),
        layers.Dropout(rate),
        layers.Dense(10, activation='softmax')
    ])

    model.compile(optimizer='adam',
                  loss='sparse_categorical_crossentropy',
                  metrics=['accuracy'])

    print(f"Training with Dropout rate: {rate}")
    history = model.fit(train_images, train_labels, epochs=20, batch_size=128, validation_split=0.2)
    test_loss, test_acc = model.evaluate(test_images, test_labels)
    print(f"Test accuracy with Dropout rate {rate}: {test_acc}")
```

```
Training with Dropout rate: 0.2
Epoch 1/20
375/375 [==============================] - 2s 4ms/step - loss: 0.4481 - accuracy: 0.8661 - val_loss: 0.1565 - val_accuracy: 0.9580
Epoch 2/20
375/375 [==============================] - 1s 3ms/step - loss: 0.1917 - accuracy: 0.9422 - val_loss: 0.1239 - val_accuracy: 0.9611
Epoch 3/20
375/375 [==============================] - 1s 3ms/step - loss: 0.1439 - accuracy: 0.9568 - val_loss: 0.1060 - val_accuracy: 0.9686
Epoch 4/20
375/375 [==============================] - 1s 3ms/step - loss: 0.1165 - accuracy: 0.9646 - val_loss: 0.0970 - val_accuracy: 0.9713
Epoch 5/20
375/375 [==============================] - 1s 3ms/step - loss: 0.0976 - accuracy: 0.9700 - val_loss: 0.0841 - val_accuracy: 0.9747
```

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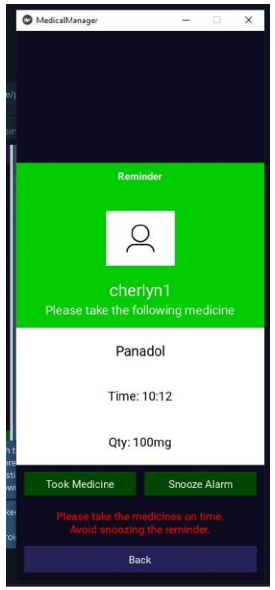
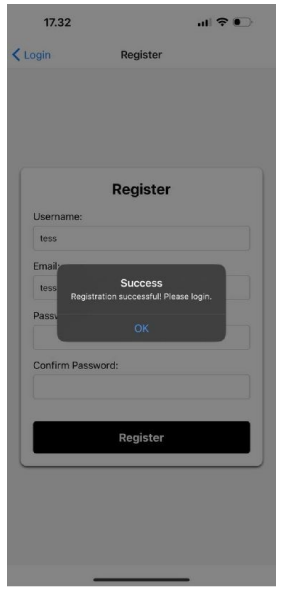
OUR WORK

PROGRAMMING TASKS

Mobile Apps

Native & cross-platform builds, tested





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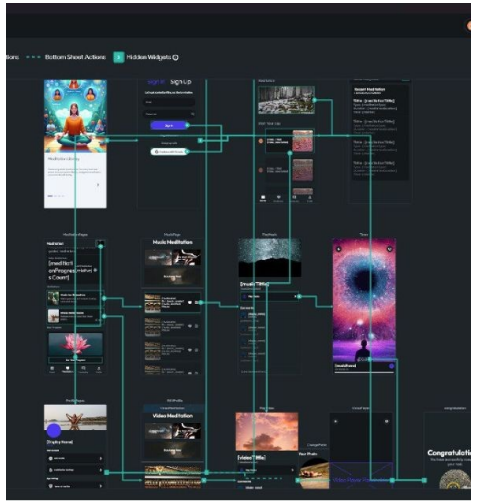

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PROGRAMMING TASKS

Web Apps

Full-stack platforms & dashboards

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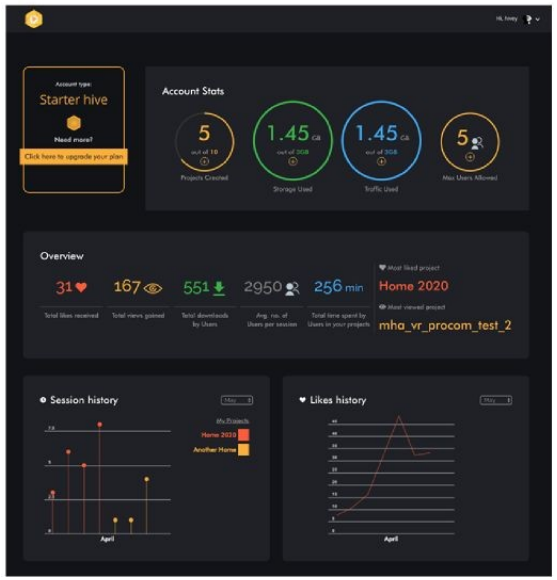

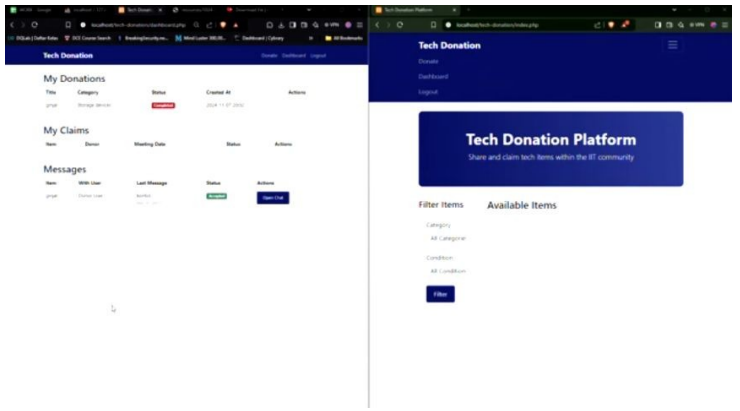

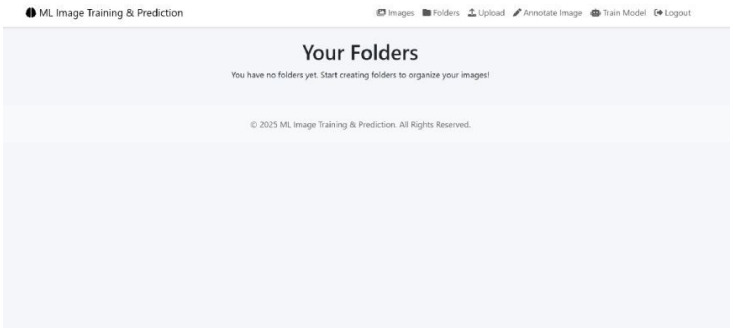

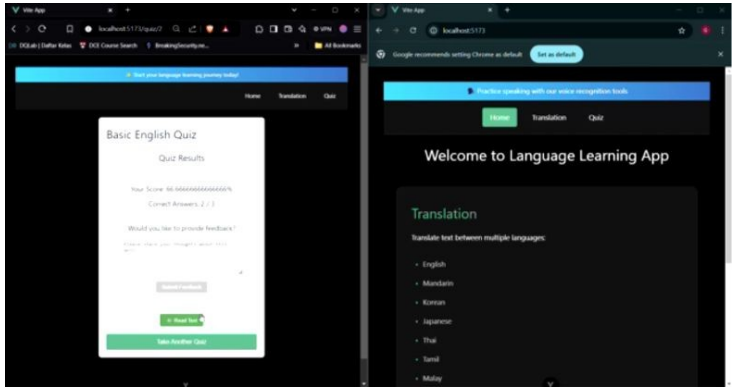

OUR WORK

PROGRAMMING TASKS

Tableau, Power BI & SPSS

BI dashboards & statistical analysis

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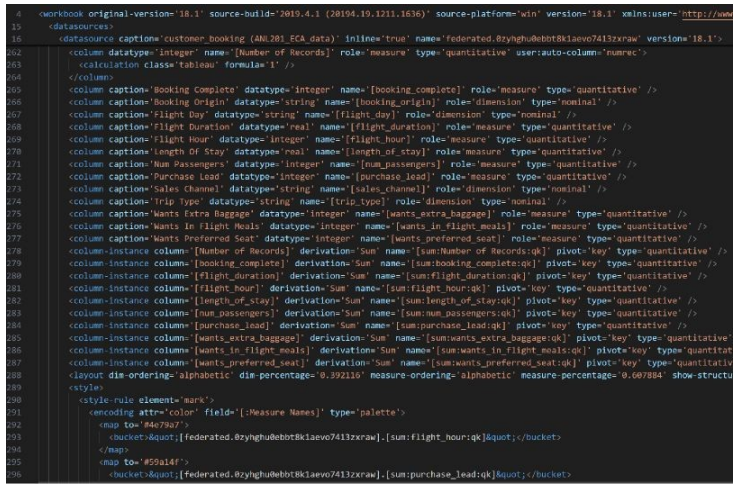
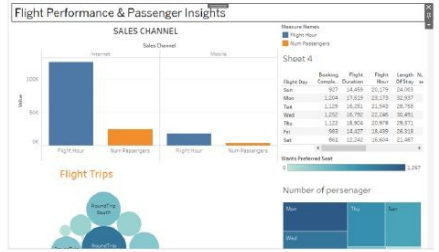


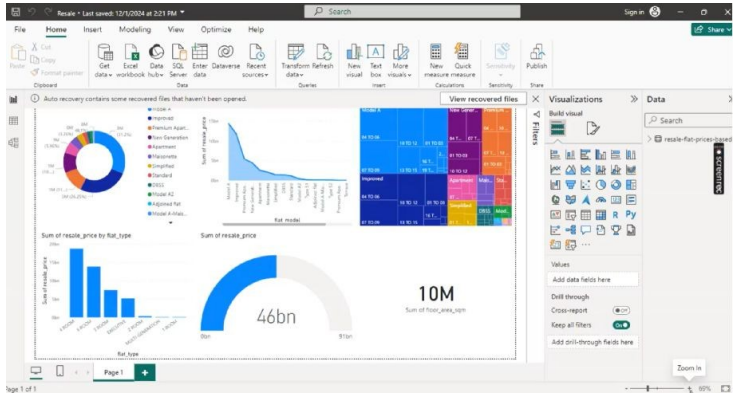
Relevance

It is for this reason that the dashboard should be designed with only the most important information relevant to the evaluation of business performance, never overloading the user with too much information. Every chart and table points toward key metrics-ormap effectiveness of sales channels, distribution of flight hours, or passenger traffic versus day of the week. This gives decision-makers an immediate visual awareness of critical areas of business without having to sort through information that is not essential.



Interaction and Actions

Interactivity within the dashboard enhances its usefulness by digging into the data interactively and flexibly. The filter action of this dashboard enables one to personalize the view



Hypothesis Testing

1. **T-Test: Gender vs. Entrepreneurial Intention**

T-Test

Group Statistics

	gender	N	Mean	Std. Deviation	Std. Error Mean
Creating a new company (living an entrepreneur)	Male	796	4.56	1.902	.067
	Female	897	4.64	1.939	.065

Independent Samples Test

		Levene's Test for Equality of Variances: F	Sig.	t-test for Equality of Means: t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference: Lower	Upper
Creating a new company (living an entrepreneur)	Equal variances assumed	.083	.773	5.509	1693	<.001	<.001	.515	.094	.332	.699
	Equal variances not assumed			5.515	1677.082	<.001	<.001	.516	.093	.332	.698

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval: Lower	Upper
Creating a new company (living an entrepreneur)	Cohen's d	1.922	.268	.172	.364
	Hedges' correction	1.925	.268	.172	.364
	Glass's delta	1.939	.266	.169	.362

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

The first hypothesis tested was whether there is a significant difference in entrepreneurial intention between male and female students. The independent samples T-Test results indicate that there is a statistically significant difference between the two groups ($t = 5.509$, $df = 1693$, $p < 0.001$). Male students have a higher mean entrepreneurial intention score ($M = 4.56$, $SD = 1.902$) compared to

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PROGRAMMING TASKS

ANSYS, MATLAB & Revit

Simulation, Simulink models & BIM

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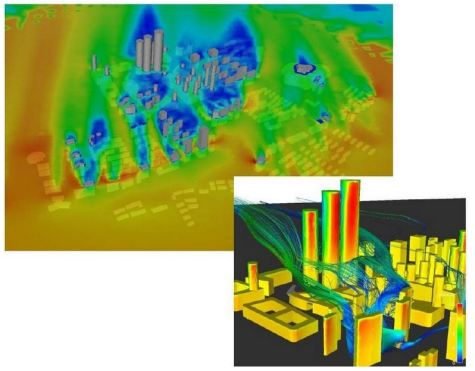
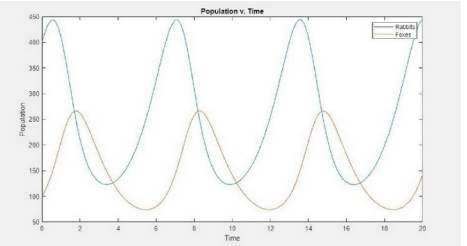
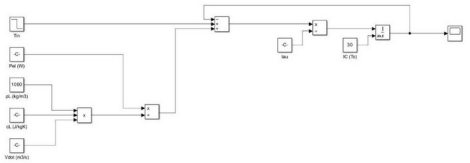
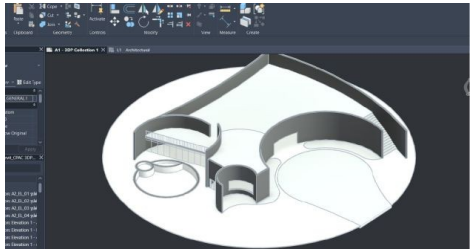
```matlab
% Exercise 1
clear all; clc;

% Calculate I based on given formula
I = 145;

% Calculate A and T based on I
A = 250/(I + 100);
T = 1/(5*I);

% Time vector
t = linspace(0, T, 1000);

% Original square wave function
f_original = zeros(size(t));
f_original(t > 0 & t < T/2) = A;

% Plot for different N values
N_values = [5 10 20];
figure('Position', [100 100 1200 400]);

for idx = 1:length(N_values)
    N = N_values(idx);
    f_approx = zeros(size(t));

    % Calculate a0
    a0 = A/2;
    f_approx = f_approx + a0;

    % Calculate Fourier series
    for n = 1:N
        % an = 0 for all n (due to odd symmetry)
        % bn calculation for odd n
        if mod(n,2) == 1
            bn = (2*A/(n*pi))*(1 - cos(n*pi));
        else
            bn = 0;
        end
```









OUR WORK

PROGRAMMING TASKS

SolidWorks & AutoCAD

3D CAD modelling & engineering drawings

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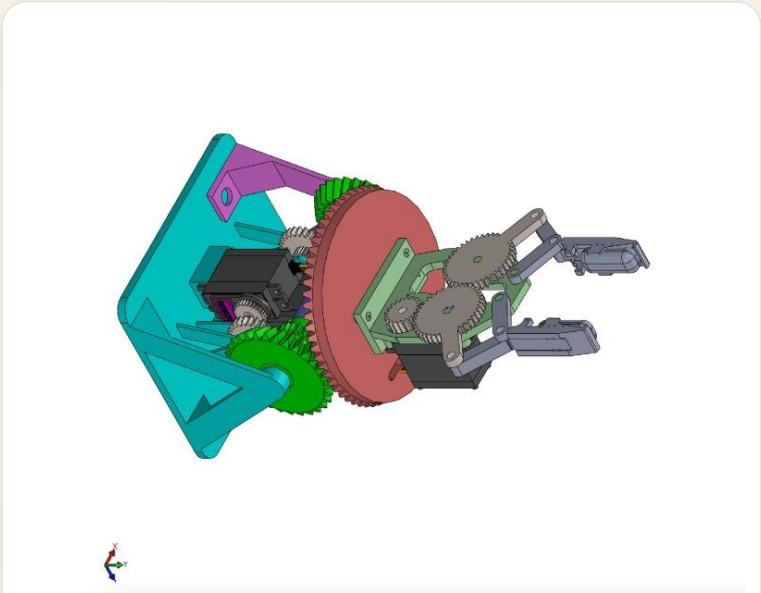
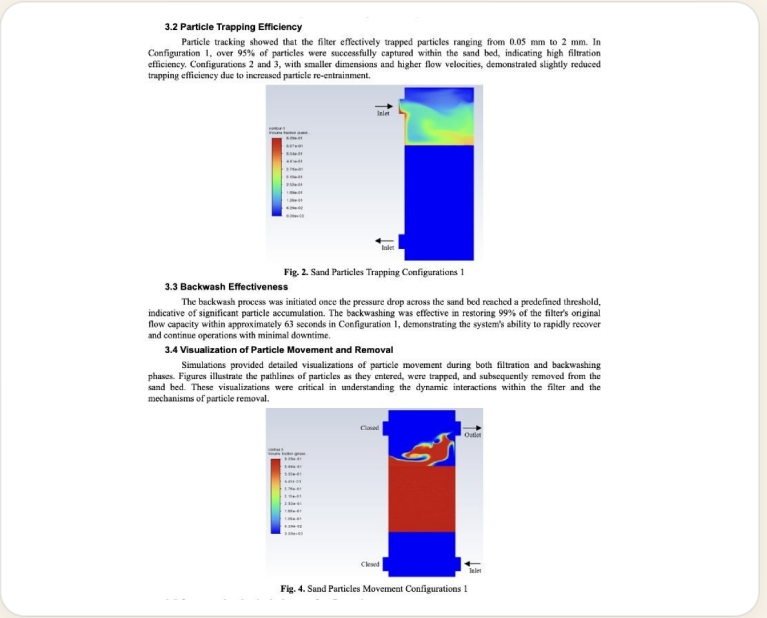




3.2 Particle Trapping Efficiency

Particle tracking showed that the filter effectively trapped particles ranging from 0.05 mm to 2 mm. In Configuration 1, over 95% of particles were successfully captured within the sand bed, indicating high filtration efficiency. Configurations 2 and 3, with smaller dimensions and higher flow velocities, demonstrated slightly reduced trapping efficiency due to increased particle re-entrainment.

Fig. 2. Sand Particles Trapping Configurations 1

3.3 Backwash Effectiveness

The backwash process was initiated once the pressure drop across the sand bed reached a predefined threshold, indicative of significant particle accumulation. The backwashing was effective in restoring 99% of the filter's original flow capacity within approximately 63 seconds in Configuration 1, demonstrating the system's ability to rapidly recover and continue operations with minimal downtime.

3.4 Visualization of Particle Movement and Removal

Simulations provided detailed visualizations of particle movement during both filtration and backwashing phases. Figures illustrate the pathlines of particles as they entered, were trapped, and subsequently removed from the sand bed. These visualizations were critical in understanding the dynamic interactions within the filter and the mechanisms of particle removal.

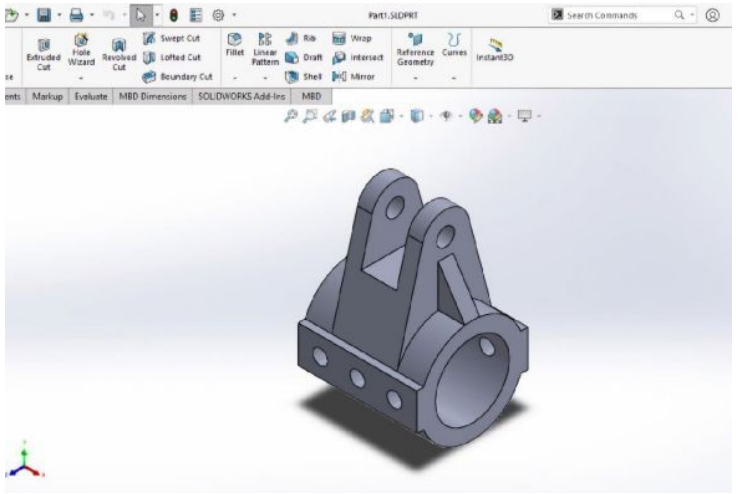
Fig. 4. Sand Particles Movement Configurations 1

2. Schematic Drawing

Here is the exploded view of the Solar Neck Fan. The battery is installed on both the right and left sides of the fan to distribute weight evenly. The solar panel is positioned on the exterior to maximize exposure to solar light for efficient energy harvesting. Ventilation holes are integrated into the casing to ensure proper airflow, with the motor positioned directly adjacent to these holes to optimize space utilization.

Figure 18. Exploded view of Solar Neck Fan

The fan is custom-designed to match the motor type and the compact size of the neck fan, ensuring effective air circulation. A total of 36 small holes are strategically placed near the neck area to enhance airflow directed toward the user's face, providing maximum cooling efficiency. The backside of the fan accommodates the PCB and the on/off push button, ensuring ease of access while maintaining a sleek design. This layout allows for an organized internal structure while optimizing performance and usability..



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Cybersecurity

Tooling, scripts & threat modelling

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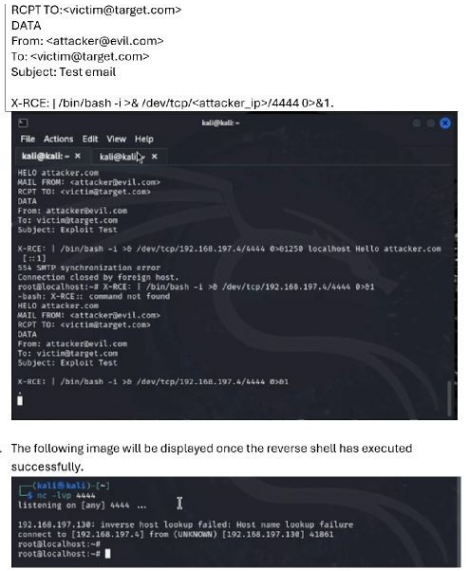
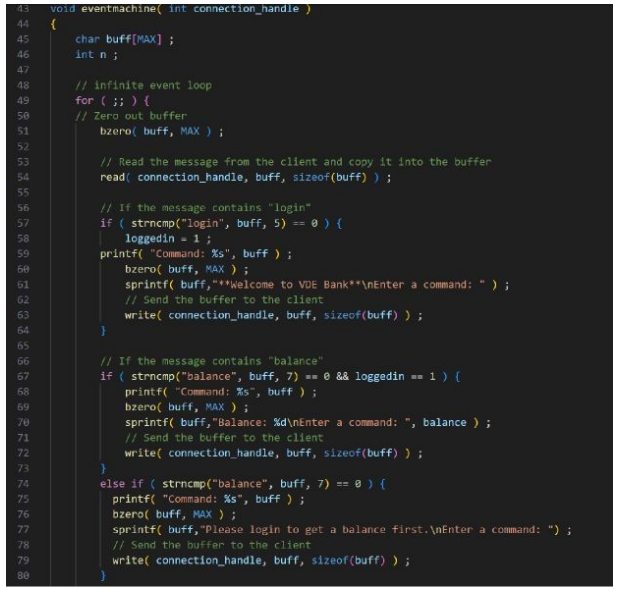


. The following image will be displayed once the reverse shell has executed successfully.



```
void eventmachine( int connection_handle )
{
    char buff[MAX] ;
    int n ;

    // infinite event loop
    for ( ;; ) {
    // Zero out buffer
        bzero( buff, MAX ) ;

        // Read the message from the client and copy it into the buffer
        read( connection_handle, buff, sizeof(buff) ) ;

        // If the message contains "login"
        if ( strncmp("login", buff, 5) == 0 ) {
            loggedin = 1 ;
        printf( "Command: %s", buff ) ;
            bzero( buff, MAX ) ;
            sprintf( buff,"**Welcome to VDE Bank**\nEnter a command: " ) ;
            // Send the buffer to the client
            write( connection_handle, buff, sizeof(buff) ) ;
        }

        // If the message contains "balance"
        if ( strncmp("balance", buff, 7) == 0 && loggedin == 1 ) {
            printf( "Command: %s", buff ) ;
            bzero( buff, MAX ) ;
            sprintf( buff,"Balance: %d\nEnter a command: ", balance ) ;
            // Send the buffer to the client
            write( connection_handle, buff, sizeof(buff) ) ;
        }
        else if ( strncmp("balance", buff, 7) == 0 ) {
          printf( "Command: %s", buff ) ;
          bzero( buff, MAX ) ;
          sprintf( buff,"Please login to get a balance first.\nEnter a command: ") ;
          // Send the buffer to the client
          write( connection_handle, buff, sizeof(buff) ) ;
        }
```

7.2.2 Scan Triggering (ZAP Integration)

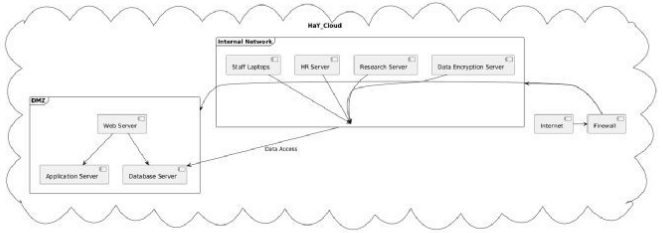
This code triggers an active or passive scan using ZAP based on the user's input and the output of the scan can be export into PDF file format, providing a structured summary of vulnerabilities and recommended remediation steps.

Figure 7.2: Zap Integration Code

7.2.3 Get CVE

A critical feature of the system is querying the Common Vulnerabilities and Exposures (CVE) database. The CVE database provides details on known security vulnerabilities. The system fetches CVE information for vulnerabilities detected by OWASP ZAP. When ZAP identifies a vulnerability but lacks a corresponding CVE ID, the system queries an external API (such as Vulners) using the vulnerability description or associated CWE ID.

By leveraging external CVE databases, the system provides detailed descriptions, severity scores, and recommendations on how to address the identified vulnerabilities.



Task 2: Threat Landscape and Security Recommendations for HaY

Currently, with nation-wide test groups and sensitive medical information, HaY's infrastructure places a huge demand on an organization to understand the threat landscape. First of all, performing an appraisal of the current threat landscape is the first step in mitigating security risks. Due to the sensitivity of the data they handle, healthcare organizations are very susceptible to cyber threats. According to the Ponemon Institute (2020), there is a need for HaY to take precautions against three major kinds of threats: data breaches, ransomware attacks, and insider threats.

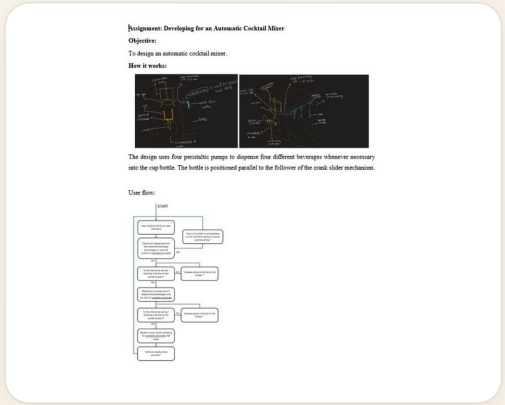
First, there is a high risk of data breach because HaY processes and stores medical and personal health data from test groups across the country. Recently, hackers have targeted healthcare organisations to steal personal information, which has a very high value in the black

OUR WORK

PROGRAMMING TASKS

Arduino & Raspberry Pi

TinkerCAD, circuits & embedded builds


Assignment: Developing for an Automatic Cocktail Mixer

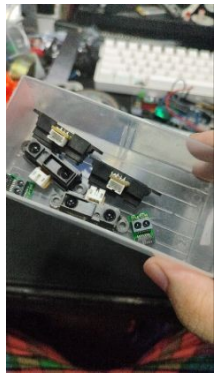
Objective:

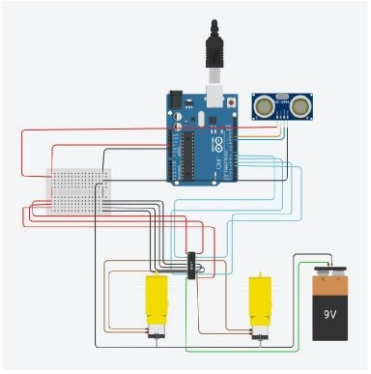
To design an automatic cocktail mixer.

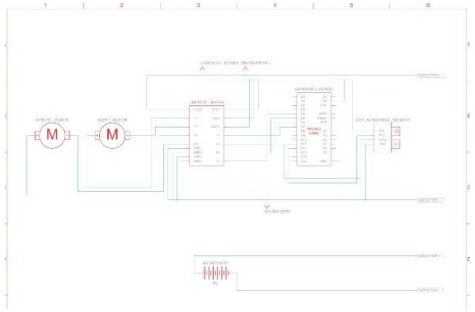
How it works:

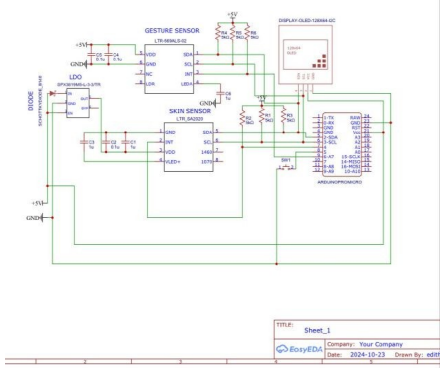
The design uses four peristaltic pumps to dispense four different beverages whenever necessary into the cup/bottle. The bottle is positioned parallel to the follower of the crank slider mechanism.

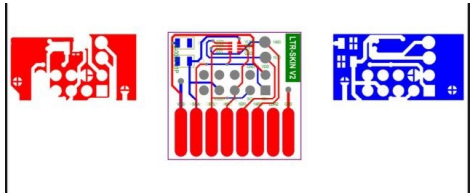
User flow:











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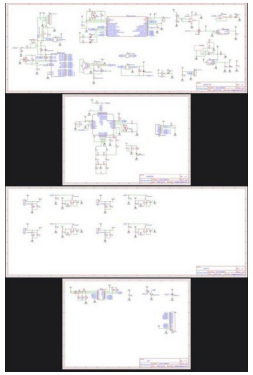

OUR WORK

PROGRAMMING TASKS

Networking & Linux

Configuration, scripting & system labs

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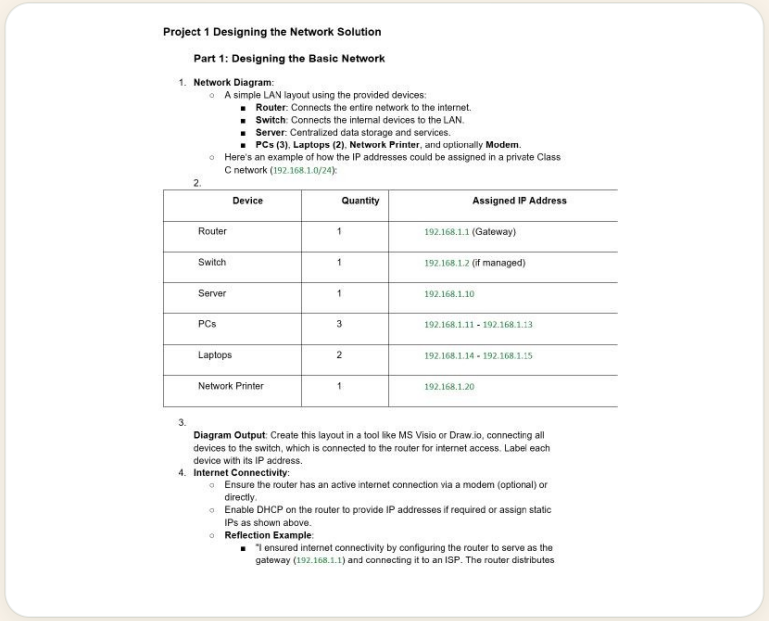


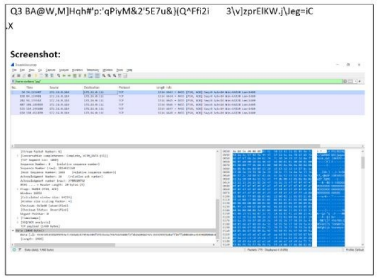
Project 1 Designing the Network Solution

Part 1: Designing the Basic Network

1. **Network Diagram**:
   - A simple LAN layout using the provided devices:
     - **Router**: Connects the entire network to the internet.
     - **Switch**: Connects the internal devices to the LAN.
     - **Server**: Centralized data storage and services.
     - **PCs (3)**, **Laptops (2)**, **Network Printer**, and optionally **Modem**.
   - Here's an example of how the IP addresses could be assigned in a private Class C network (192.168.1.0/24):
2.

Device	Quantity	Assigned IP Address
Router	1	192.168.1.1 (Gateway)
Switch	1	192.168.1.2 (if managed)
Server	1	192.168.1.10
PCs	3	192.168.1.11 - 192.168.1.13
Laptops	2	192.168.1.14 - 192.168.1.15
Network Printer	1	192.168.1.20

3. **Diagram Output**: Create this layout in a tool like MS Visio or Draw.io, connecting all devices to the switch, which is connected to the router for internet access. Label each device with its IP address.
4. **Internet Connectivity**:
   - Ensure the router has an active internet connection via a modem (optional) or directly.
   - Enable DHCP on the router to provide IP addresses if required or assign static IPs as shown above.
   - **Reflection Example**:
     - "I ensured internet connectivity by configuring the router to serve as the gateway (192.168.1.1) and connecting it to an ISP. The router distributes

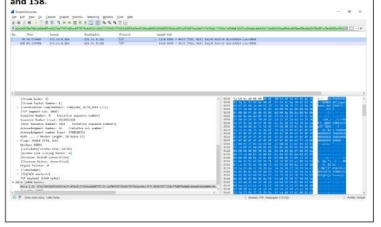


Q3 BA@W,M]Hqh#'p:'qPiyM&2'5E7u&)(Q^Ffi2i 3\v]zprElKW.;\leg=iC
X

Screenshot:

What are the packet numbers (in the pcap file) that triggered the IDS alert?
(Hint: Use Wireshark to search for the hex or ASCII string found in question 1)

After applying the following filter: "data == <hexadecimal-string>", I have found that there are 2 frames that have the same hexadecimal string. The frame numbers are **34 and 158.**



```
# Actual IP address before connecting to Nipe
actual_ip=$(get_current_ip)

# Start Nipe
sudo perl nipe.pl start
sleep 5  # Wait for Nipe to establish the connection

# Get the spoofed IP address
spoofed_ip=$(get_current_ip)
country=$(get_current_country)

# Check if the IP address has changed
if [ "$actual_ip" == "$spoofed_ip" ]; then
    echo "Failed to connect through Nipe."
    echo "Your IP address remains: $actual_ip"
    sudo perl nipe.pl stop
    exit 1
else
    echo "Connected through Nipe."
    echo "Spoofed IP: $spoofed_ip"
    echo "Country: $country"
fi
```

```
┌──(kali㉿kali)-[~/nipe]
└─$ sudo chmod u+x anonymity-check.bash

┌──(kali㉿kali)-[~/nipe]
└─$ ls -l anonymity-check.bash
-rwxr--r-- 1 root root 595 Jun  2 15:54 anonymity-check.bash

┌──(kali㉿kali)-[~/nipe]
└─$
```

sudo — gaining superuser access

chmod — change permission

u+x — allow root user as an owner of this file to execute it

```
┌──(kali㉿kali)-[~/nipe]
└─$ sudo ./anonymity-check.bash
Connected through Nipe.
Spoofed IP: 185.220.101.16
Country: Germany
```

sudo — gaining superuser access

./anonymity-check.bash — execute the script

SSH Remote Server and Scan Machine with User Given Domain/URL

Create a script named "scanning.sh" to get domain/url from user input and connect to remote server to scan target machine by given domain/url. At the end, it will log all scan information.

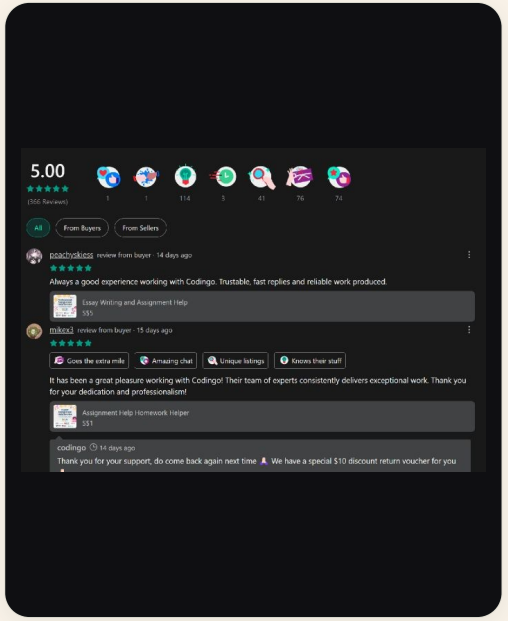
TESTIMONIALS

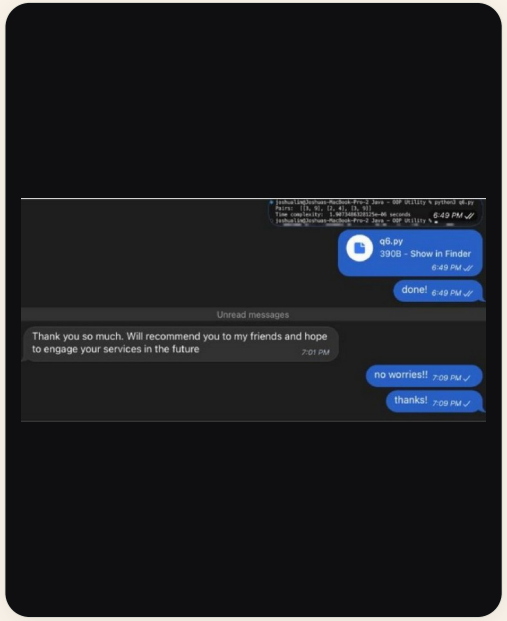
Real students. Real grades.

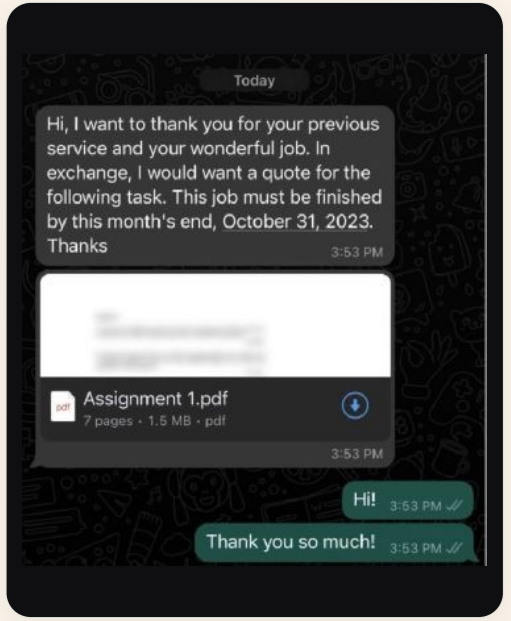
★★★★★ 4.98 · 430+ reviews

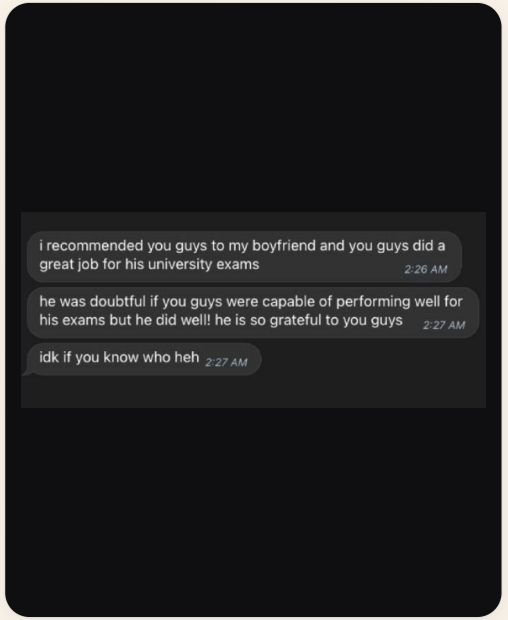
“Just received my results today , I got a High Distinction. Thankful for you!”

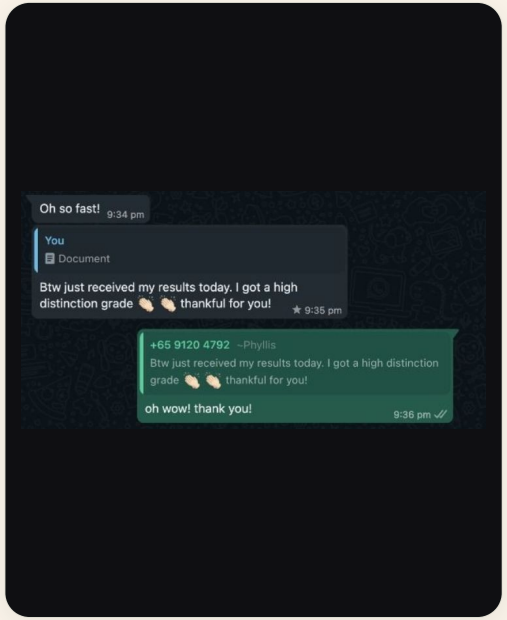
P. · VIA WHATSAPP











✓ *a real, verified student*

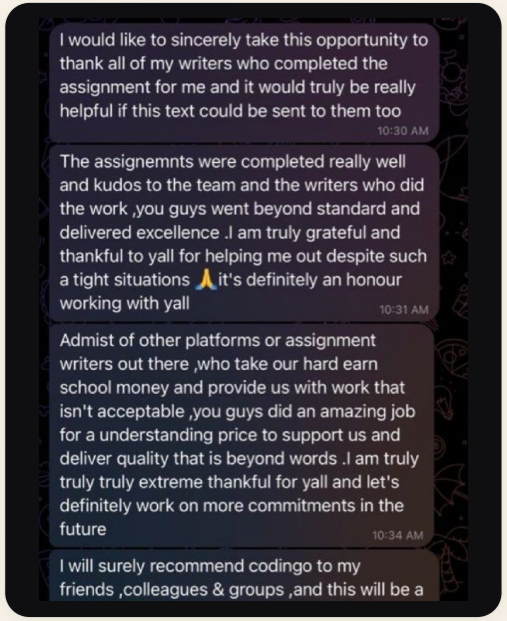
TESTIMONIALS

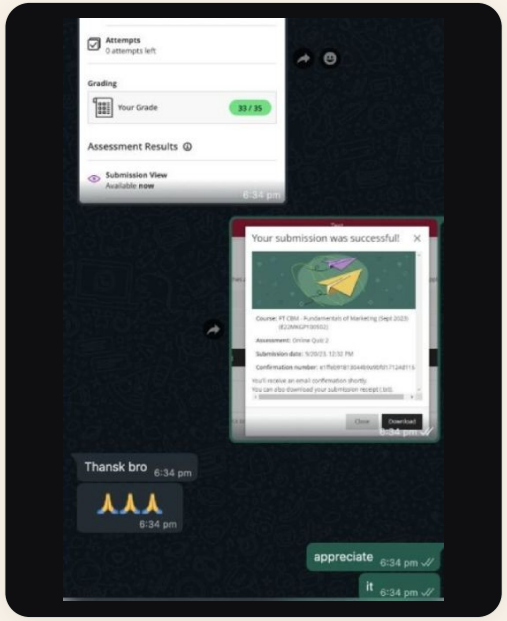
Straight from the chat.

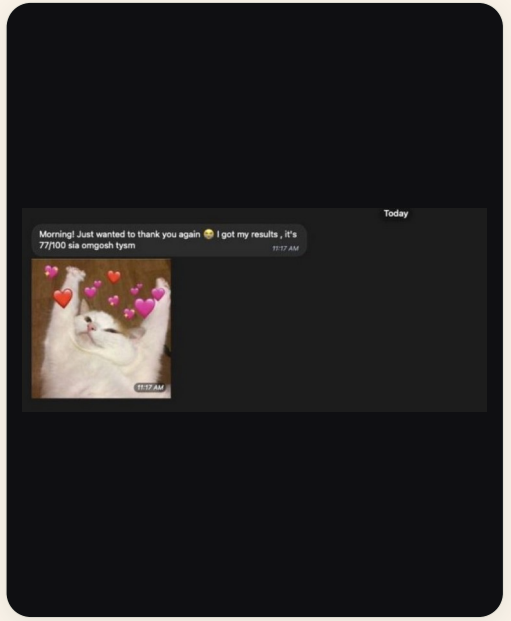
★★★★★ 4.98 · 430+ reviews

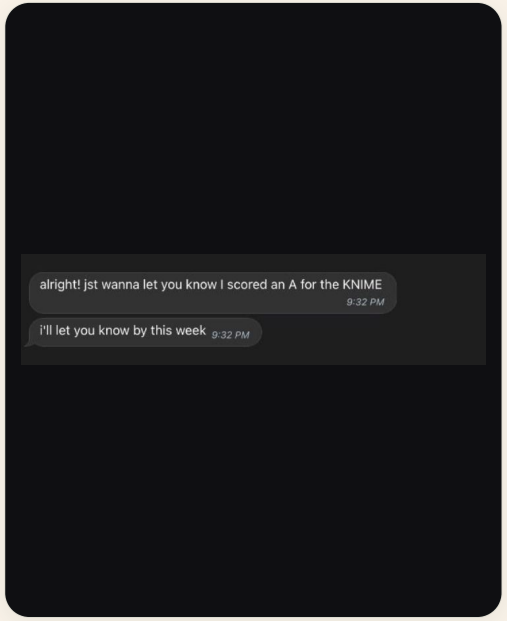
“You guys went beyond standard and delivered excellence. Truly grateful.”

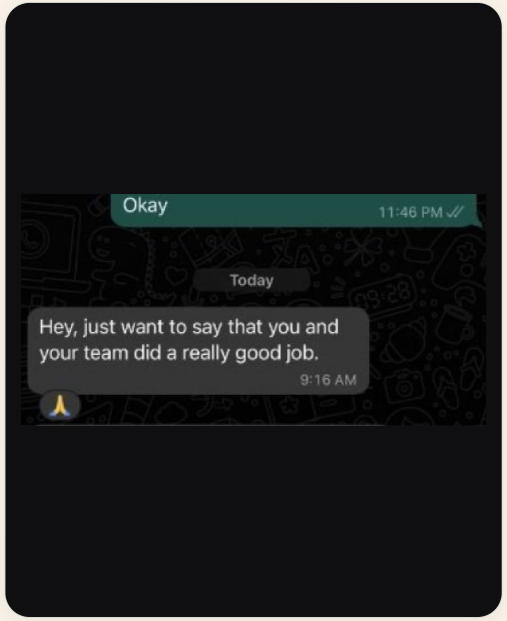
A. · VIA TELEGRAM











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TESTIMONIALS

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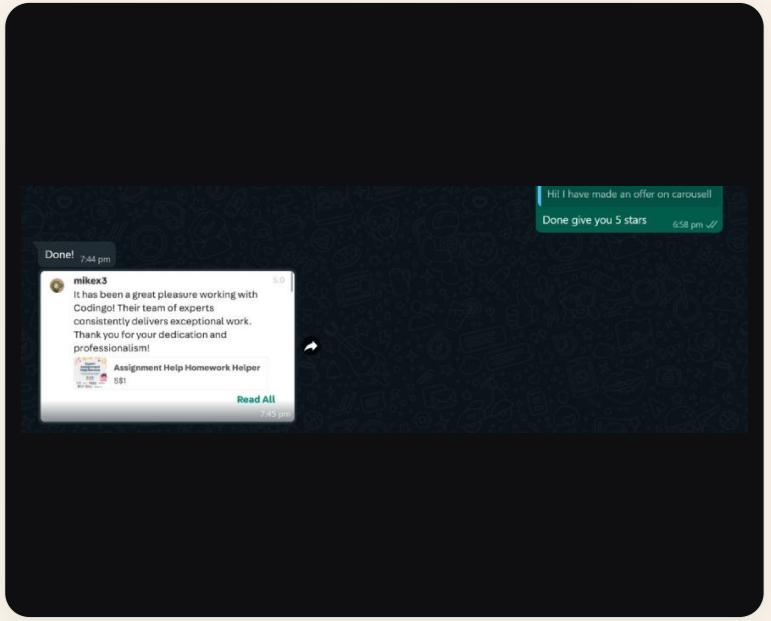
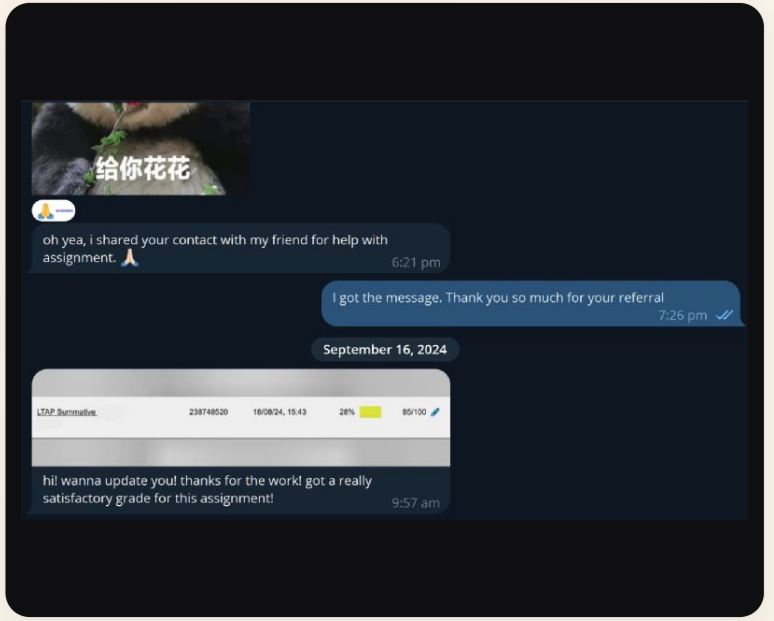
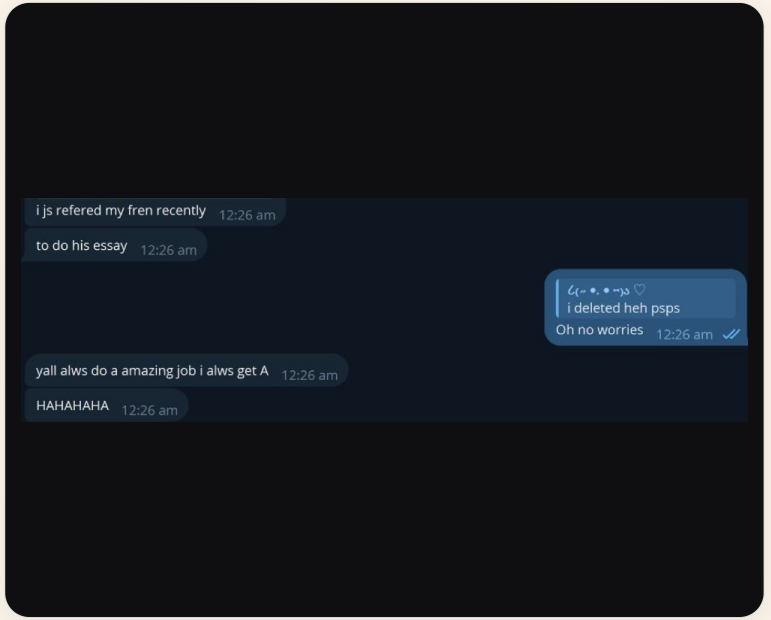
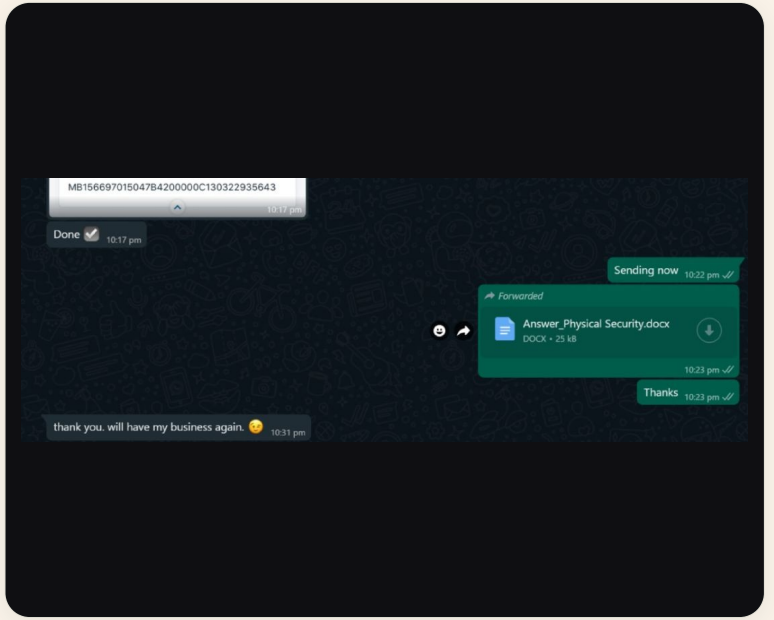
“Just wanna let you know I scored an A for the assignment. Thank you!”

J. · DATA ANALYTICS









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According to our computer records, the company is listed as LIVE COMPANY. Its activity(ies) is/are listed as

Primary Activity : ONLINE MARKETPLACES FOR EDUCATION SERVICES (63203)

Secondary Activity : DEVELOPMENT OF SOFTWARE AND APPLICATIONS (EXCEPT GAMES AND CYBERSECURITY) (62011)

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Good Standing

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Johnathan Toh

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Three steps. A real person at every one.

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