CPT111: Principles of Programming
Assignment 1
Investment Apps.

As a software engineer in your company, you has been given a task is to develop an application that accurately calculates the return on investment for potential investors, taking into consideration the investment rules. A minimum investment of MYR 5,000 and a maximum of investment is MYR 200,000. The application should have a user-friendly interface that allows investors to input their investment information and calculate the total amount of profit. To be eligible for investment, individuals must be at least 18 years old but not older than 70 years old, with a minimum investment period of five years and a maximum of twenty-five years based on the age limit of the investor. The profit earned for the current year will be added to the initial investment amount, and then the total amount will be calculated for the profit for the following year. However, if investors withdraw their investment within five years, a penalty charge of 7% will be incurred from the total amount of investment earned. For investments below MYR 50,000, there is an annual increment of 0.15% from the base profit every year. Investments between MYR 50,000 and MYR 100,000 have an annual increment of 0.25% every year from the base profit, and for investments above MYR 100,000, there is an annual increment increase of 0.35% every year for the first ten years and 0.55% for the remaining years from the base profit. Additionally, profit tax will be imposed based on the total amount of profit earned. Total Profit below MYR 70,000 will have a tax rate of 3%, those above MYR 70,000 and below MYR 150,000 will have a tax rate of 5%, and those above MYR 150,000 will have a tax rate of 7%. Profit tax will calculated after deducting service charge. All investments will be improsed 2.5% of service charge of total profit earned.Based on the input given by a user, your program should provide at least the following features:

- Calculate Profit. Based on input, the application should be able to calculate the total amount of profit earned, total tax, and net profit.
- Target Profit. Given some inputs (e.g., example based on the amount of investment and the target amount of profit), the application can tell the user the length of the investment in years.
- Other feaures, you can think based on your creativity.

Your program **must** have the following:

- Good and interactive user Interface Design (i.e. Presentable manner and easy to understand)
- Input validation. (e.g. if investor's age is 67 years old, he is not allowed to invest due to age limitation)
- Input error handling
- Meaningful comments in the source codes
- Built-in function in cmath library is not allowed in your program.
- Your program should demonstrate the correct and appropriate use of selection and repetition control structures.

You are required to provide the following:
1. Analyze the problem & Specification of requirements: (A soft copy of document: Max 3 pages)
    a. List of Input /output
    b. Process or formula
    c. List of Variables and type.
2. C++ program.

You are encouraged to add any **additional features or any suitable elements that you learned in class** where appropriate to improve the usability and the functionality of your application

SUBMITION INSTRUCTIONS:

Please submit your assignment (individually):
1) Stage 1: Upload a softcopy 3 pages documentation to e-learning. The name of the file that you upload must follow this format: MatricNo_YourName_Doc [E.g. 123456_LeePiran_Doc].
Deadline: 17 April 2023 11.59 PM)

2) Stage 2:   Upload C++ Program to e-learning. The name of the file that you upload must follow this format: MatricNo_YourName_Code [E.g. 123456_LeePiran_Code].
Deadline: 9 May 2023 (11.59 PM)

Note: The design of the program is unique according to individual!!!!!. Failure to answer on program specification and explanation could lead you to be charged as a copy.

Important Notes:

All assignments must be submitted before/on the given date. Late submissions without prior approval from the lecturer will not be accepted.

Using Chat GPT is prohibited.

Plagiarism/pirating and copying are severe academic offense. Students that are found to plagiarize/or reproduction (copying) will get an F for the assignment/report or for the whole coursework grade.

If you any queries about this assignment, please do not hesitate to contact Mohd Azam Osman (Room 712) azam@usm.my

Example: If initial amount of investment is MYR 20,000.00, base profit is 7 % and duration of investment is 10 years.

  Total Profit: MYR 21,893.25

  Service Charge: MYR 547.33

  Proft After Service Charge: MYR 21,345.92

   Profit Tax: MYR 640.38

  Net Profit: MYR 20,705.54