

BSc (Hons) Computing**Module Code: QH0305 Module Title: Problem Solving****Assessment Sheet 1****Instructions:**

This is one of the eight assessment tasks, which will contribute to the overall mark. You will need to complete the tasks as outlined below and then document them in a Word document file. As a minimum, you should provide screenshots of the following:

- Your code
- The output that your code generates

In instances where your code could generate different outputs depending on what values are given, you should provide multiple screenshots of the console screen, showing the different outputs in order to demonstrate that the code works correctly.

This assessment will focus on variables and operators.

You must attempt all tasks on this sheet to achieve a higher grade. For example, if you want to gain Grade A, you must complete all other grades first and add them to your portfolio with screenshots.

A zip folder with all Grade codes must be attached inside of the portfolio (MS Word file).

Task 1: Personal fitness tracker

In this task, you will write a small program designed to monitor personal fitness activities and facilitate goal management.

The program should calculate the average weekly activity duration across different exercise categories (such as running, cycling, swimming, weightlifting, and yoga) inputted by the user.

To achieve a D grade (basic activity tracking)

- Create variables to store five different fitness activities (e.g., running, cycling, swimming, weightlifting, and yoga) and assign values, in minutes, for each one within your code.
- Calculate the total weekly activity time, measured in minutes, using these variables.
- Print the total weekly activity duration in minutes.
- You need to provide screen shots of your code and the different outcomes it can give.
- Your Word document should have appropriate headings to ensure that this task can easily be identified alongside the rest of your work.

To achieve a C grade (user input and error handling)

Complete all previous steps, then make the following changes:

- Retrieve the values of all the fitness activities, in minutes, from the user.
- Implement error handling to ensure that only valid inputs (positive numbers) are accepted.
- Calculate the total weekly activity duration using the inputted values.
- Add functionality to set a weekly activity goal in minutes.
- Print whether the weekly activity duration meets the goal.

To achieve a B grade (multi-week tracking and comparison)

Complete all previous steps, then:

- Add an additional feature to the program that allows the user to track activities for two consecutive weeks.
- Retrieve different activities (e.g., running, cycling, swimming, weightlifting, and yoga) for each of the two weeks from the user.
- Calculate the total activity duration for each week and compare it with the weekly goal.
- Print a summary report for each week, indicating goal achievement.
- Add a feature to compare activity durations between the two weeks and calculate the percentage increase or decrease. Print whether activity duration has increased, decreased, or remained the same, along with the calculated percentage change.
- Ensure all the tasks are accompanied by written descriptions or annotations. These must show satisfactory understanding of how the code works.

To achieve an A grade (dynamic input and detailed reports)

Complete all previous steps, then:

- Enhance the program by allowing the user to input any number of fitness activities dynamically, from the set of five available activities. The user can select the number of activities they wish to add activity duration for, either in all five categories (e.g., running, cycling, swimming, weightlifting, and yoga) or any number of them.
- Prompt the user to enter the number of categories they want to consider.
- Retrieve the categories and corresponding durations in a loop, based on the user's input.
- Calculate the total activity duration, in minutes, using the variables.
- Implement a feature that shows a breakdown of activity duration by category for each week.
- Print detailed weekly activity reports, including comparisons of the total activity duration for each week against the weekly goal, together with a percentage difference indicator.

Assignment Preparation Guidelines

- All components of the assignment report must be Word-processed (**handwritten text or hand drawn diagrams are not acceptable**), font size must be within the range of 11 point to 14 point, including the headings, body text and any texts within diagrams.
- Standard and commonly used fonts such as Times New Roman, Arial or Calibri should be used.
- All figures, graphs and tables must be numbered and labelled with short explanations.
- Materials from external sources must be properly acknowledged and cited within the text, using the Harvard referencing system.
- All components of the assignment (text, diagrams, Codes, etc.) must be submitted in one Word file.
- The report should be logically structured, the core of the report may start by defining the problem / requirements, followed by the proposed solution including a detailed discussion, analysis and evaluation, leading to the implementation and testing stage, and finally, a conclusion and a personal reflection on learning.
- Screenshots without description / discussion are not suitable as they do not express your understanding and/or they do not support your work adequately.

Submission instructions

- This is a portfolio assignment with eight tasks in total. Each task will be completed and saved in the portfolio. Once the portfolio is completed, it should be submitted on/via Turnitin. The submission link to Turnitin can be found under the “Assessment Tab” in your module section in the SOL VLE.
- Please note file size limitation might apply. Your report must be under 250MB.
- The source code for each task should be **zipped** and **attached** to your Word document report submission in the appendix.
- The Assignment Brief can be found under the “Assessment Tab” in your module section in the SOL VLE.
- **Refer to the Assignment Brief** to find the links to Late Submissions, Extenuating Circumstances, Academic Misconduct, Ethics Policy, Grade marking and Guidance for online submission through Solent Online Learning (SOL).