BSc (Hons) Computer Science
BSc (Hons) Cyber Security
Module Code: QH0305 Module Title: Problem Solving
Assessment Sheet 3

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.

You must attempt all tasks on this sheet to achieve a higher mark. For example, if you want to gain marks between 70 - 100, you must complete all other tasks first and add them to your portfolio with screenshots.

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

Assessment Task 3: Unit Conversion Tool

In this task, you will create a program that converts between different units of measurement (e.g., length, weight, and time). The user will input values and select the conversion type. The program will use **loops** and **conditional statements** to manage the functionality.

To achieve Marks (Between 40-49)

Requirements:

1. Write a program that performs a single **length conversion** from kilometers to miles.
2. Prompt the user to input a distance in kilometers.
3. Convert the distance to miles using the formula: Miles=Kilometers×0.621371
4. Display the converted value in miles.
5. Provide screenshots of the code and its outputs.
6. Use appropriate headings in the Word document to ensure the task is easily identifiable.

Example Interaction:

Enter the distance in kilometers: 5
Converted distance: 3.11 miles

To achieve Marks (Between 50-59)
Requirements:

1. Complete all previous steps.
2. Extend the program to allow the user to perform **multiple conversions**.
3. Use a **loop** to repeatedly prompt the user for a distance in kilometers and perform the conversion.
4. After each conversion, ask the user if they want to convert another distance. If they choose to quit, display the total number of conversions performed.
5. Provide screenshots showing various outputs and cases.

Example Interaction:
Enter the distance in kilometers: 5
Converted distance: 3.11 miles

Do you want to convert another distance? (y/n): y
Enter the distance in kilometers: 10
Converted distance: 6.21 miles

Do you want to convert another distance? (y/n): n
You performed 2 conversions.

To achieve Marks (Between 60-69)
Requirements:

1. Complete all previous steps.
2. Add functionality to allow the user to choose between different types of unit conversions:
    - **1: Length (Kilometers to Miles)**.
    - **2: Weight (Kilograms to Pounds)**.
    - **3: Time (Hours to Minutes)**.
3. Use conditional statements to perform the chosen conversion:
    - For kilometers to miles: Miles=Kilometers×0.621371
    - For kilograms to pounds: Pounds=Kilograms×2.20462
    - For hours to minutes: Minutes=Hours×60
4. After performing the conversion, display the result and prompt the user if they want to perform another conversion.
5. Display the total number of conversions performed when the user quits.

Example Interaction:

Select a conversion type:
1: Length (Kilometers to Miles)
2: Weight (Kilograms to Pounds)
3: Time (Hours to
Minutes) Enter your
choice: 1

Enter the distance in kilometers: 5
Converted distance: 3.11 miles

Do you want to perform another conversion? (y/n): y
Select a conversion type:
1: Length (Kilometers to Miles)
2: Weight (Kilograms to Pounds)
3: Time (Hours to
Minutes) Enter your
choice: 3

Enter the time in hours: 2
Converted time: 120 minutes

Do you want to perform another conversion? (y/n): n
You performed 2 conversions.

To achieve Marks (Between 70-100)

Requirements:

Complete all previous steps, then:

- All tasks must be accompanied by written descriptions or annotations. These must demonstrate satisfactory understanding of what the code does.
- To higher grades, tasks will require some independent research. For example, investigate other loops different from what you used above and recreate this program that demonstrates the same output you produced before.
- Document this in your portfolio and provide a detailed explanation of the loop structure used, comparing it to the previous loop structure

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.
- Material from external sources must be properly acknowledged and cited within the text using the Harvard referencing system.
- All components of the assignment (text, diagrams, code 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, finally a conclusion and a personal reflection on learning.
- Screenshots without description / discussion are not suitable as they do not express your understanding or 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 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).