

BSc (Hons) Computing**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 marks. You will need to complete the tasks as outlined below and then document them in a Word document. 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 it is given), you should provide multiple screenshots of the console screen, showing the different outputs to demonstrate that the code is working correctly.

This assessment will focus on loops.

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 3: Temperature conversion utility

In this task, you will create a program that converts temperatures between Celsius and Fahrenheit. The user will be able to input multiple temperatures and choose the conversion direction. The program should use loops to process the input and continue running until the user chooses to quit.

To achieve a D grade

Write a program that converts a single temperature from Celsius to Fahrenheit.

- Prompt the user to input a temperature in Celsius.
- Convert the temperature to Fahrenheit using the formula: $F = C * 9/5 + 32$.
- Display the converted temperature.
- You need to provide screenshots of your code and the different outcomes it can provide.
- Appropriate headings must be used in portfolio to ensure that this task can easily be identified alongside the rest of your work.
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To achieve a C grade

Complete all previous steps, then:

- Enhance your program by adding a loop that allows the user to convert multiple temperatures until they choose to quit.
- After each conversion, ask the user if they want to convert another temperature. If they choose to continue, repeat the process with a new input. If they choose to quit, end the program.
- Keep track of the number of conversions performed.
- Display the final count when the user decides to quit (e.g., "You converted X temperatures.").
- You need to provide screenshots 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 B grade

Complete all previous steps, then:

- Modify the program to handle both Celsius to Fahrenheit and Fahrenheit to Celsius conversions.
- Prompt the user to choose the conversion direction (Celsius to Fahrenheit or Fahrenheit to Celsius) before entering the temperature.
- Use conditional statements to perform the selected conversion:
 - For Celsius to Fahrenheit: $F = C * 9/5 + 32$.
 - For Fahrenheit to Celsius: $C = (F - 32) * 5/9$.
- Display a message indicating the direction of the conversion and the converted temperature.
- Provide hints based on the temperature value:
 - If converting to Fahrenheit, indicate whether the resulting temperature is above or below freezing (32°F).
 - If converting to Celsius, indicate whether the resulting temperature is above or below freezing (0°C).

All tasks must be accompanied by written descriptions or annotations. These must show satisfactory understanding of what the code is doing.

To achieve an A grade

Complete all previous steps, then:

- In most assessment tasks, to attain 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 for the game.

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).