

SFWR TECH 3PR3

Decision Making & Looping

For each of the following problems, be sure to output the results to the console.

1. Create a program that performs the following tasks:
 - a. Prompt the user for a temperature that is the boiling point of a substance and store this in an appropriate variable.
 - b. Prompt the user for the current temperature of the substance.
 - c. Output the boiling point temperature and the current substance temperature.
 - d. Output an appropriate message. The message will be one of the following:
 - i. The substance temperature is below the boiling point.
 - ii. The substance temperature is at or above the boiling point
2. Create a program that performs the following tasks:
 - a. Prompt the user for an integer value.
 - b. Display the following menu:
 1. Integer divisible by 3?
 2. Integer between 10 and 100?
 - c. If the user enters the value 1, determine whether the value 3 is a divisor of the integer and output an appropriate message. If the user enters the value 2, calculate whether the value is between 10 and 100 or not and output an appropriate message (The value is less than 10, between 10 and 100, or greater than 100). If the user enters a value other than 1 or 2, output a message indicating that the value is not a menu item. It is not expected to loop back to show the menu again. This is a run-once application.
3. Create a program that will output the volume V of a sphere for a given radius R . The program user inputs the initial, incremental, and ending values of the radius. For each value of the radius, the program will calculate the corresponding volume $V = 4\pi R^3/3$ and will print the radius and the volume in tabular format (2 columns). Use SI units.
4. Create a program that validates input as follows:
 - a. Prompt the user for a value that could be a decimal value.
 - b. Use a loop structure to test the value. The value must be between 0 and 200, including 0 and 200. If the value is outside this range, output an appropriate message and prompt the user for a new value. If the value is within the range, output a message that displays the value and indicates it is in the appropriate range.

Note: - Indicate the units for all I/O values required from- or provided to- the user.