Exercises

Note that all the source code that you develop must be uploaded onto Github.

1. For this exercise, you will need to find out how to use random number generators in C++. In this regard, write a program that checks a user's subscription to a service as follows:
   i. Your program must first generate a random integer between **0** and **11**. The random number must be assigned to an integer variable named ***daysUntilExpiration*.**
   ii. Your program must output onto the console a single message onto the console based on the following conditions:
      - If the user's subscription will expire in 10 days or less, the message must be as follows: **Your subscription will expire soon. Renew now!**
      - If the user's subscription will expire in five days or less, the message must be as follows:
        Your subscription expires in value of daysUntilExpirationdays
        Renew now and save 10%!
      - If the user's subscription will expire in one day, the message must be as follows:
        Your subscription expires within a day!
        Renew now and save 20%!
      - If the user's subscription has expired, the message must be as follows:
        Your subscription has expired.
      - If the user's subscription doesn't expire in 10 days or less, the message must be as follows:
        You have an active subscription.
   iii. Your solution must use separate **if** and **if-else** statements to implement the conditions above. The **if-else** statement can include multiple **else if** parts.
2. Create a new program and rewrite the program in exercise 1 using a **switch statement**. The output must remain the same as the output in exercise 1.
3. Declare an array and initialize it to contain the following string elements:

B123
C234
A345
C15
B177
G3003
C235
B179

Create a for loop statement to iterate through each element of your array. In your loop, you will need to check for every element that starts with the letter "**B**". In the regard, you need to evaluate each element of the array and output onto the console each one of the elements that start with the letter "**B**".

4. Using a **while loop**, write a program that does the following:
    i. As an output to the console, you program must prompt the user for an integer value between 5 and 10.
        - In this regard, your solution must ensure that the input is a valid representation of an integer.
        - If the integer value is not between 5 and 10, your code must use a output to the console a statement to prompt the user for an integer value between 5 and 10.
    ii. Your solution must ensure that the integer value is between 5 and 10 before exiting the iteration.
    iii. Your solution must ensure that the integer value is between 5 and 10 before exiting the iteration.
    iv. After the loop iteration code block: your solution must output to the console a statement to inform the user that their input value has been accepted.
    v. Below is example output from the program.

```
Enter an integer value between 5 and 10
three
Sorry, you entered an invalid number, please try again
1
You entered 1. Please enter a number between 5 and 10.
6
Your input value(6) has been accepted.
```

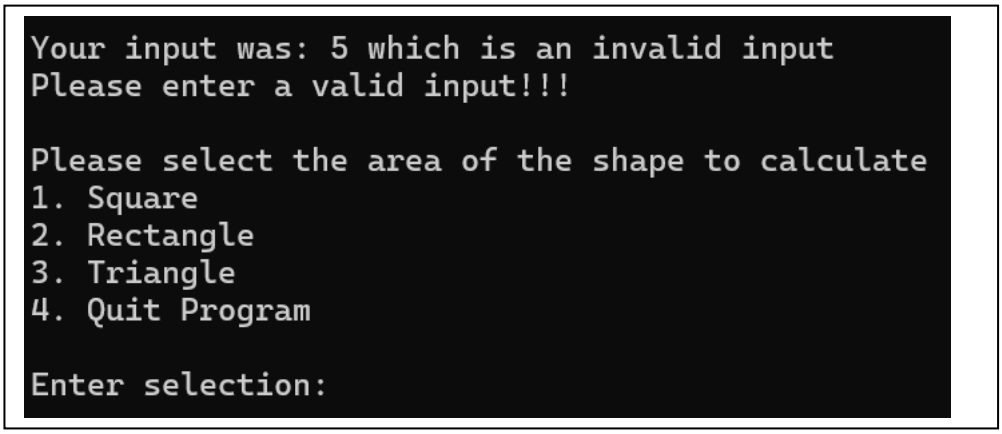
5. Write a program that calculates the area of a shape as follows:
    i. The program must have functions for calculating the area of a **triangle**, a **rectangle** and a **square**. In this regard, when the program starts, it must ask the user to select which shape to calculate the area for as shown in the following image.

```
Please select the area of the shape to calculate
1. Square
2. Rectangle
3. Triangle
4. Quit Program

Enter selection:
```

    ii. As shown in in the image, the user must be asked for input that corresponds to the choices provided. If the user enters the wrong input then the program must inform the user that the input that was entered was invalid, at which point the program must ask, the user to enter a valid input.
    iii. Upon entering the correct input, the program must ask the user to enter the appropriate data needed for the chosen area calculation. When the user provides the appropriate data, the area must be calculated and output onto the console.

iv. Upon providing the user with the calculated area based on the data provided by the user, the program must start from beginning, asking the user for input to calculate the area of a shape. In this regard, the program must not stop running until the user provides the input for quitting the program.



6. Write a program that does the following:

i. You must have an already prepared text file which has the following statement within it: **This is the Advanced Computer Programming Module**

ii. Your program must open the text file prepared in **(i)** and the contents of that text file must be assigned to a string variable named ***fileData***.

iii. Your program must provide functionality for calculating and outputting onto the console the number of vowels in the text file statement using the ***fileData*** variable created in (ii) above.

iv. Your program must provide functionality for calculating and outputting onto the console the number of words in the text file statement using the variable ***fileData*** created in (ii) above.

v. Your program must implement a function called **Reverse,** which reverses the text file statement using the ***fileData*** variable created in (ii) above, and your program must output onto the console the statement in reverse as a result of the **Reverse** function.

vi. Your program must implement functionality capitalizing the **second** letter of which word from statement stored in the ***fileData*** variable created in (ii) above. In this regard, Your program must output onto the console the statement with the second letter of each word capitalized, as a result of the capitalization functionality.