Chapter 6 Programming Project

Your name:
IDE used: Visual Studio Replit
URL to GitHub repository:
Project 1. isPrime Function

A prime number is a number that is only evenly divisible by itself and 1. For example, the number 5 is prime because it can only be evenly divided by 1 and 5. The number 6, however, is not prime because it can be divided evenly by 1, 2, 3, and 6.

Write a function name isPrime, which takes an integer as an argument and returns true if the argument is a prime number, or false otherwise. Demonstrate the function in a complete program.

Branch Name in GitHub repository:
Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Reflection:
1. What did you find most challenging with this program?

2. What problems did you encounter and how did you solve them?

3. What did you learn from writing this program?

URL to GitHub repository:
Project 2. Coin Toss

Write a function named coinToss that simulates the tossing of a coin. When you call the function, it should generate a random number in the range of 1 through 2. If the random number is 1, the function should display "heads." If the random number is 2, the function should display "tails." Demonstrate the function in a program that asks the user how many times the coin should be tossed, then simulates the tossing of the coin that number of times.

Branch Name in GitHub repository:
Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Reflection:
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3. What did you learn from writing this program?

URL to GitHub repository:
Project 3. Celsius Temperature Table
The formula for converting a temperature from Fahrenheit to Celsius is

$$C = \frac{5}{9}(F - 32)$$

where F is the Fahrenheit temperature and C is the Celsius temperature. Write a function named celsius that accepts a Fahrenheit temperature as an argument. The function should return the temperature, converted to Celsius. Demonstrate the function by calling it in a loop that displays a table of the Fahrenheit temperatures 0 through 20 and their Celsius equivalents..

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Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

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URL to GitHub repository:
Project 4. Population
In a population, the birth rate is the percentage increase of the population due to births, and the death rate is the percentage decrease of the population due to deaths. Write a program that displays the size of a population for any number of years. The program should ask for the following data:

    The starting size of a population
    The annual birth rate
    The annual death rate
    The number of years to display

Write a function that calculates the size of the population for a year. The formula is:
N = P + BP − DP
where N is the new population size, P is the previous population size, B is the birth rate, and D is the death rate.

Input Validation: Do not accept numbers less than 2 for the starting size. Do not accept negative numbers for birth rate or death rate. Do not accept numbers less than 1 for the number of years.

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Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Reflection:
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URL to GitHub repository:
Project 5. Paint Job Estimator
A painting company has determined that for every 110 square feet of wall space, 1 gallon of paint and 8 hours of labor will be required. The company charges $25.00 per hour for labor. Write a modular program that allows the user to enter the number of rooms that are to be painted and the price of the paint per gallon. It should also ask for the square feet of wall space in each room. It should then display the following data:

The number of gallons of paint required

The hours of labor required

The cost of the paint

The labor charges

The total cost of the paint job

Input validation: Do not accept a value less than 1 for the number of rooms. Do not accept a value less than $10.00 for the price of paint. Do not accept a negative value for square footage of wall space.

Branch Name in GitHub repository:
Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Reflection:
1. What did you find most challenging with this program?

2. What problems did you encounter and how did you solve them?

3. What did you learn from writing this program?