420-AP1-AS - ALGORITHMS AND PROGRAMMING – COMPUTER SCIENCE TECHNOLOGY – PROGRAMMING
Section 07218

ASSIGNMENT 5 – Looping Instructions

XIMENA CARRILLO

LaSalle College
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For the following exercises:

- Create a new project called “Assignment5” into your solution “AP1_2023”
- Write the code in C#.
- Send the whole project in a “.rar” or “.zip” file by Lea

First Step: Create a Menu for your app:

a. Wrap your entire program in a while loop (or do-while loop) that allows the user to run it multiple times if they so choose.
b. Inside the while loop, create a menu and a corresponding switch case statement that allows the user to select any of the questions below. Each question should correspond to one case in the switch case statement.

Exercises:

1. Create a program that asks the user to enter 2 doubles: a minimum and a maximum. The program then asks the user to enter a third double between the minimum and maximum. Check if the third number is inside the range, and, using a loop, prompt the user to try again until the entered number is actually inside the range (no matter how many tries it takes). Once the number they entered is valid, output their number back to them along with a success message.
2. Create a program that asks the user for an integer, and then outputs the factorial of that integer.
   The factorial of a number is the product of all the integers from 1 to that number. For example, the factorial of 6 is 1*2*3*4*5*6 = 720 . Factorial is not defined for negative numbers, and the factorial of zero is one.
3. Write an algorithm that calculates the sum of all the integers contained (inclusively) between two positive integer limits entered by the user. The program reads the smallest limit first.
   Example: the sum of the integers between 5 and 10, inclusively.
4. Create four algorithms, each displaying the corresponding one of the following sequences:

   a. 5 10 15 20 25 30 35 40
   b. 3 5 7 9 11 13 15
   c. 80 70 60 50 40 30 20
   d. 1 2 6 24 120 720
5. Write a program that calculates the average of 10 grades. The program asks the user for each of the grades.
6. Write an algorithm that displays the first 100 numbers of the Fibonacci sequence. This sequence begins with the numbers 1, 1, 2, 3, 5, 8, …, where each new number in the sequence can be found by adding the two previous numbers in the sequence.