

CSE103: Structured Programming
Mini Project
Summer 2020
Total Marks: 10

Problem statement:

The *factorial* of a nonnegative integer n is written as $n!$ and is defined as follows: $n! = n * (n-1) * (n-2) * \dots * 1$ and $n! = 1$ for $n = 1$. For example, $5! = 120$.

An integer number is said to be a *perfect number* if its factors, including 1 but not the number itself, sum to the number. For example, 6 is a perfect number because $6 = 1 + 2 + 3$.

The *Fibonacci* series 0, 1, 1, 2, 3, 5, 8, 13, ... begins with terms 0 and 1 and has the property that each succeeding term is the sum of the two preceding terms. For example, $3 = 1 + 2$, $5 = 2 + 3$ etc.

A number is said to be *Armstrong number* if sum of cubes of each digit of the number is equal to the number itself. For example, $153 = (1 * 1 * 1) + (5 * 5 * 5) + (3 * 3 * 3)$.

Using the above definitions, write a menu driven program, which has the following options (for each of the task, write a separate function):

1. Factorial of a number
2. Perfect number or not
3. First 100 numbers of Fibonacci series
4. Armstrong number or not
5. Exit

When the program is executed, it will display the menu on the screen and prompt user for a choice. When user chooses one of the five options, the menu will be disappeared and will perform the following actions:

1. If user presses 1, the program will take an integer as input and will display the factorial of that integer as output. The value of integer must be greater than 1 and less than 8.
2. If user presses 2, the program will take an integer as input and will display whether the given number is a perfect number or not.
3. If the user presses 3, the program will display the first 100 numbers of the Fibonacci series.

4. If the user presses 4, the will take an integer as input and will display whether the given number is Armstrong number or not.
5. If the user presses 5, the message “Thank You for using the program” will be shown and the program execution will be stopped.
6. If user presses any other key, the program will display the message “Invalid Choice. Please Try Again”.

After performing each of the above actions except for action 5, menu will be visible again.

The program will be executed repeatedly until user chooses 5 to exit from the program.