Introduction to Computer Programming

05. Structural programming

Exercises

1. Write a program which will display factorials of numbers from 1 .. 10. The factorial should be calculated using a separate function. The function should accept 1 integer parameter – the number from which to calculate the factorial, and return a long value – the calculated factorial. Place a *breakpoint* inside the function, run your program in *debug* mode and observe the *Call Stack*.

2. Divide your tic-tac-toe game into functions and classes according to functionality (e.g., separate class form game mechanics and separate class for displaying).

3. Write a structure which will allow you to store your contacts (first name, last name, phone number, email address). Afterwards, write a program which will ask the user to enter his contact data, fill the structure with this data and display the data in the console.

4. Modify your solution to the previous exercise so that the user can enter as many contacts as he/she wants. Implement a constructor in the contact structure which will allow for creating a complete contact from data passed as parameters. Next, display all the contacts from the list. Each contact should be displayed using a function implemented inside the contact structure.

5. Aggregate all the exercises done by you so far. Follow these steps:
    - Create a new program – console application, which will be used to call the solutions to each exercise from each set of assignments. Select *File -> New -> Project* and then choose *Console Application* from the *Visual C#* section.
    - Create 3 class libraries – 1 for each graded assignment. To add a library select *File -> Add -> New Project* and pick *Class Library*.
    - Place your solutions to the exercises from the assignments in the libraries corresponding with the assignments. A solution should be placed in a separate method.
    - Additionally, in each library add a method which will execute the solution with the number given as a parameter (e.g., Solution(2) should call function Solution2()).
    - Add all libraries to the console application and make sure you can access the solutions from the *Main* function. To achieve this, hit the right mouse button in *Solution Explorer* and select *Add Reference*, and then in section *Solution -> Projects* select the libraries you want to add.
    - The console application act as a main menu for your assignments from which you will be able to call your solution to any exercise you completed.