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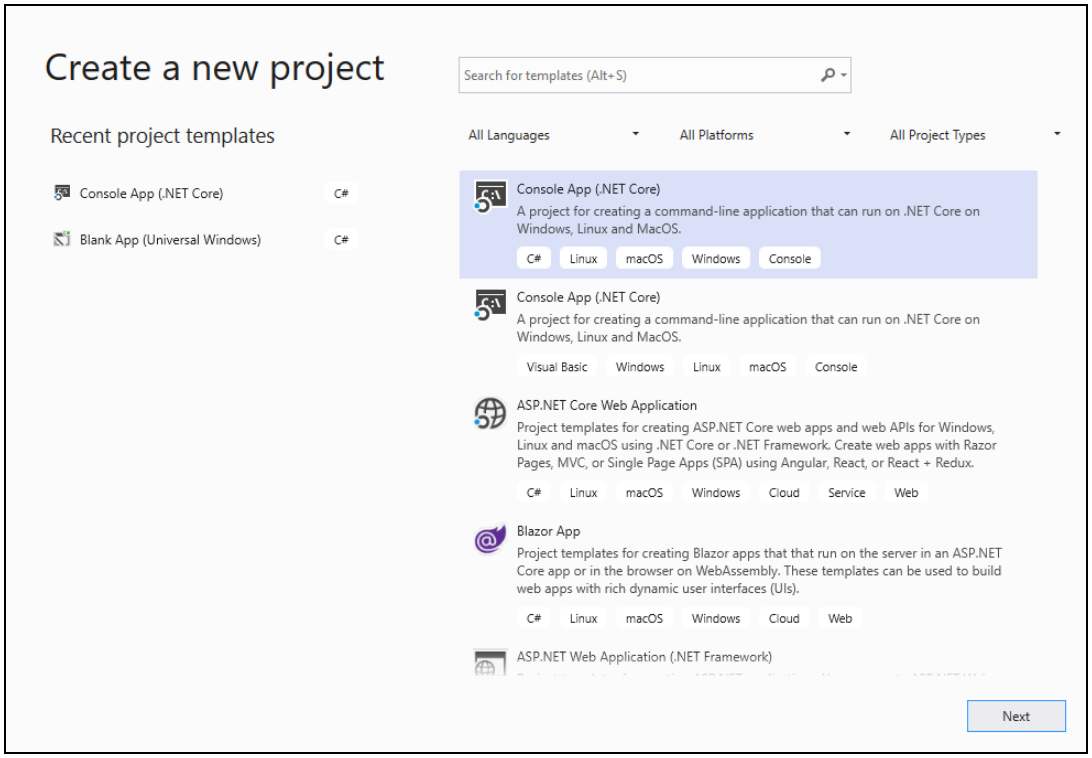
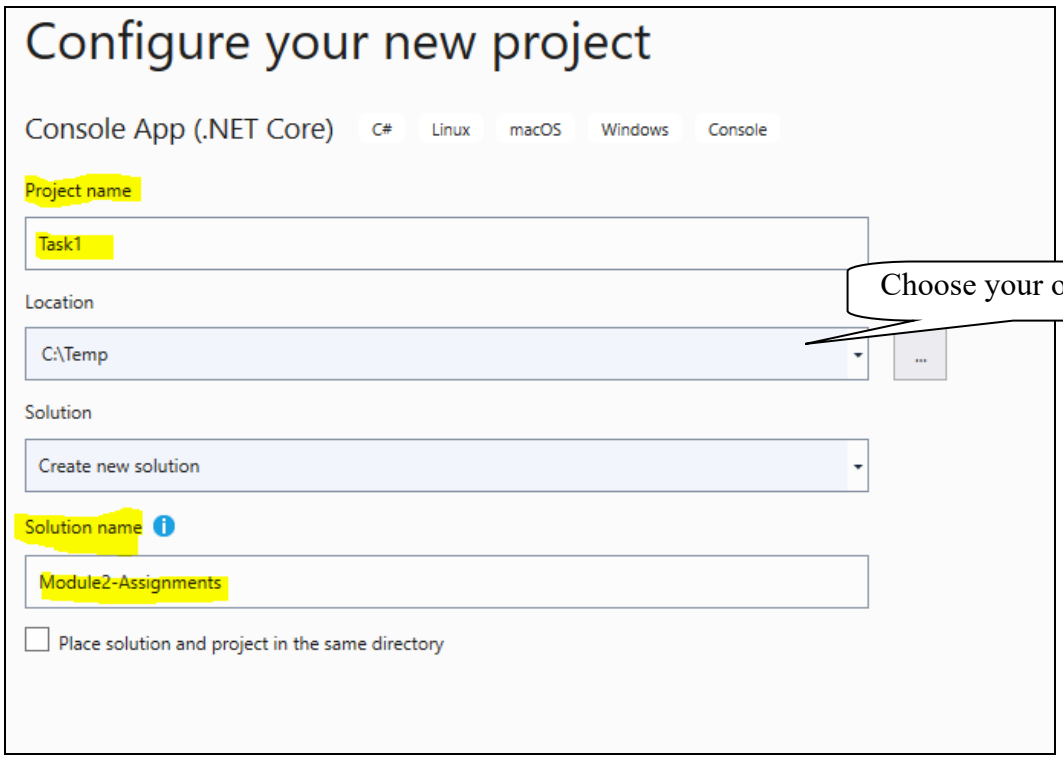
Homework C# Basics - Module 2

Information on how to do the homework:

In this assignment, you shall begin with creating one project (Console application).
Note that the ***name of your solution could be different from the name of your project****.*





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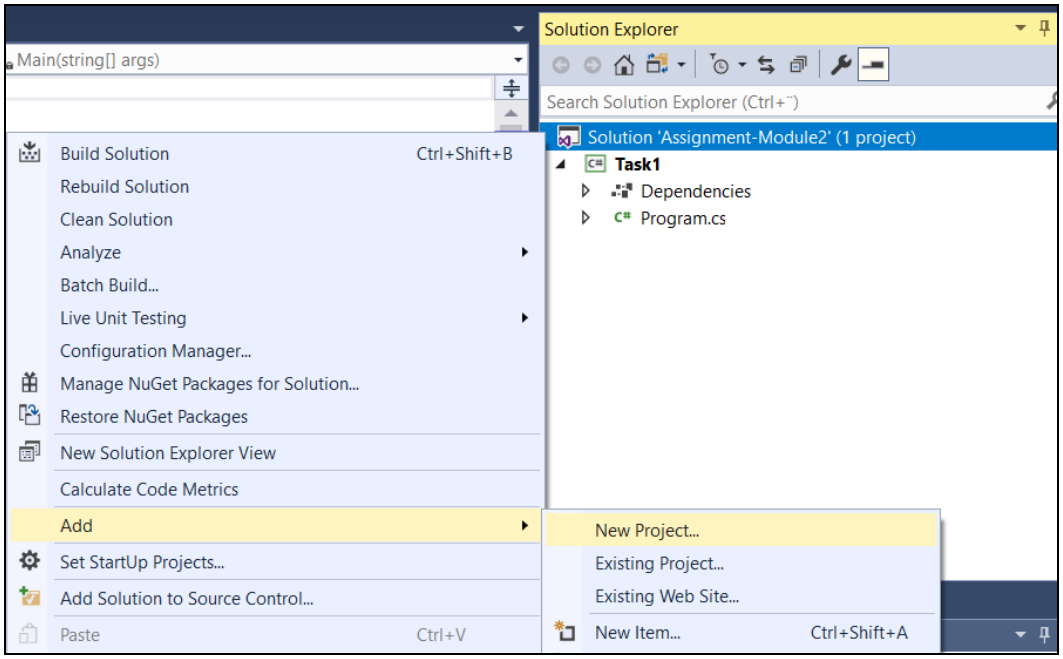
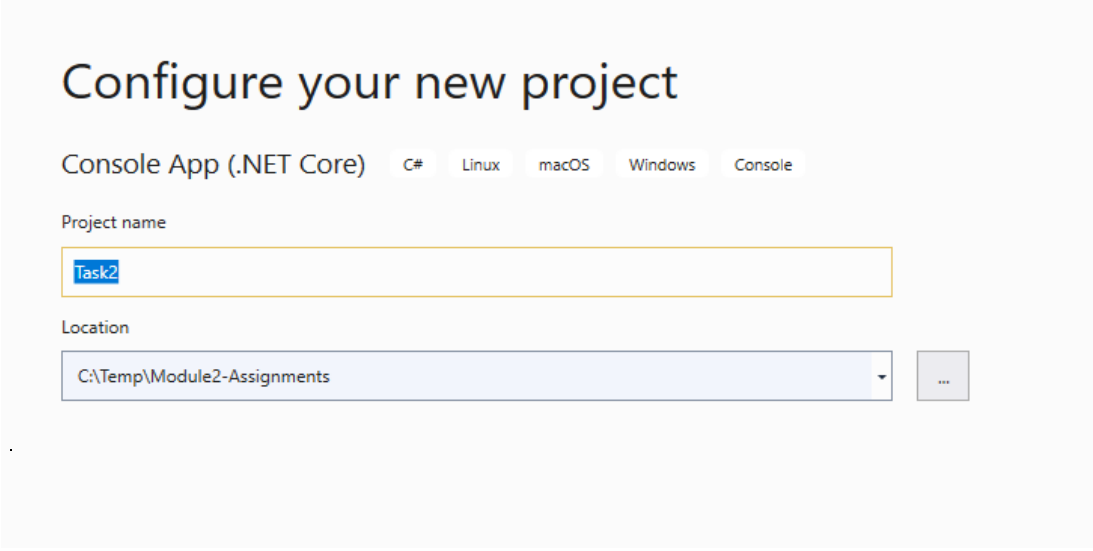
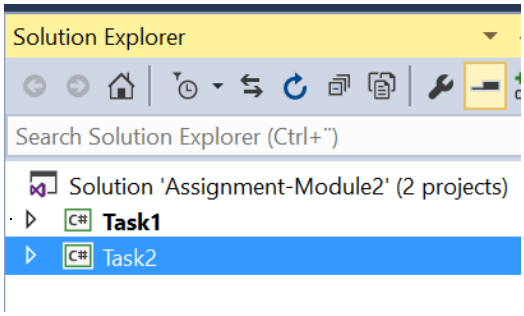
Next, you need to add one project to the same solution for each of the assignmet tasks. *To do that, you shall right click on the solution name (in the solution explorer) and click on Add/new project as below:*



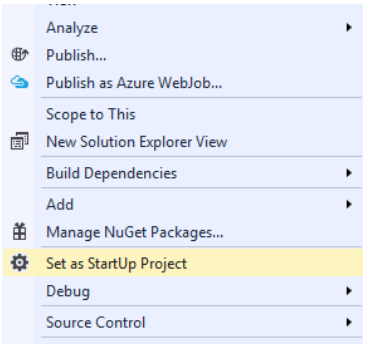




Note:

- *Each task has its own project like the picture above.*

- *In order to run one specific project in your solution, you can right click on the name of that project and choose "**Set as StartUp project**".*

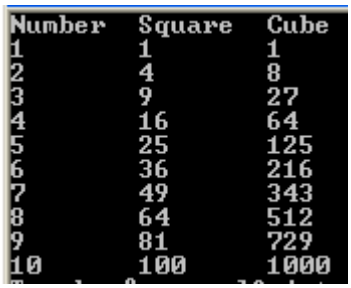


- *You have the freedom to develop the exercises further so that it reflects something from the real world.*

Now to the assignments...

Homework Assignments

1. (Loop) Using ***for-*** or ***while-*** loops**,** write an application that displays the square and cubic values of the ten integers. When you run the application, the output may look like this:



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2. (Loop and Method) The application shall ask the user to input an integer, take the integer and save it in a variable called radius, and then compute the volume of spheres with their radius from 1 to the input value. **Write a separate *method*** to do the calculation and call your method from the Main method.

For example if the input value is 10, the output shall display sphere's volume with radius **from 1 to 10**, like this:

"Sphere's volume with radius 1 is ……"
"Sphere's volume with radius 2 is ……"
……..
"Sphere's volume with radius 10 is ……"

(Sphere's volume $= \frac{4}{3}\pi \times r^3$)

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3. **(Loop and If-statement)** Write an application that prompts the user to enter the size of a square. Then display a square of asterisks with that size, e.g. if the entered size is 3, the result should look like this:

```
***
***
***
```

Your application should handle sizes from 2 to 9.
If the user enters a number <2 or >9, your application should display a square of that size, otherwise, an error message that the value entered is not appropriate.

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4. **(Loop)** Assume that the world population is 6,5 billion. Assume also that the population grows with a rate of 1.4% per year. Write an application that displays the year when the world population exceeds 10 billion.

   *Hint: Use the **while**-statement to solve the task. Construct the while-loop carefully to avoid an infinite loop.*

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5. **(Loop)** Write an application that displays a Celsius-to-Fahrenheit conversion table. It shall start **from -30 degrees Celsius** and **ends with 50 degrees Celsius. Each time the degrees shall increase by 5. (-30 , -25, -20, ….)**

No need to ask the user for any input value, meaning that when you run the application you shall see something similar to the table below: (feel free to make a nice layout for your output).

Celsius	Fahrenheit
-30	….
-25	….
-20	….
….	….
….	….
45	….
50	….

The conversion formula is: f = (9 / 5) × c + 32.

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6. Write an application that prompts a student to enter his/her grade (‘A’ to ‘F’) on a course and displays the grade’s definition in the output screen (Based on the following ECTS Definitions). **The student should be able to enter a grade many times until ‘G’ is entered to end the program.**

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ECTS Definition

A Excellent – outstanding performance with only minor errors
B Very good – above the average standard but with some errors
C Good– generally sound work with a number of notable errors
D Satisfactory – fair but with significant shortcomings
E Sufficient – performance meets the minimum criteria
Fx Fail – some more work required before the credit can be awarded
F Fail - considerable further work is required

*Hint: use a **switch**-statement embedded in a **while**-statement.*

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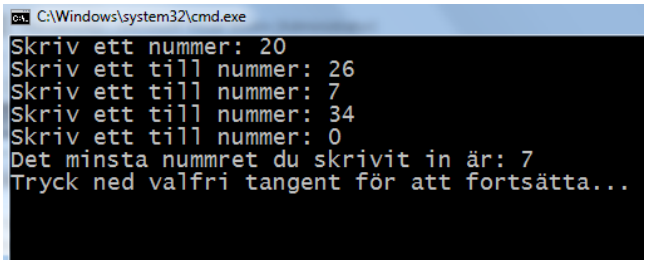
7. Your program should prompt the user for a number of integers, calculate the minimum number and display the result in the console window **as soon as the user enters the number 0.**

Here you can see an example to such an application. Your output **does not need** to be exactly the same as below, but the functionality shall be the same. (It is always good to give the user some information in the beginning of each application about how the application works, which is missing here in this example).



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8. In this exercise you should **overload a method**. Prompt the user to enter necessary data and display the return data on screen:

a) You define a static method that takes two integers and returns the sum of them.
b) Overload the method to work with float numbers (double data type)
c) Overload the method to takes two names, concatenate them and return the result text (string data type)
d) A complex number can be expressed in the form ‘a+bi’. It has a real part ‘a’ and an imaginary/complex part ‘b’. Overload the method that takes four integers (two for real parts and two for imaginary parts) and then returns a string that contains the sums of the real parts and imaginary parts of the two numbers. (See the example on the next page!)

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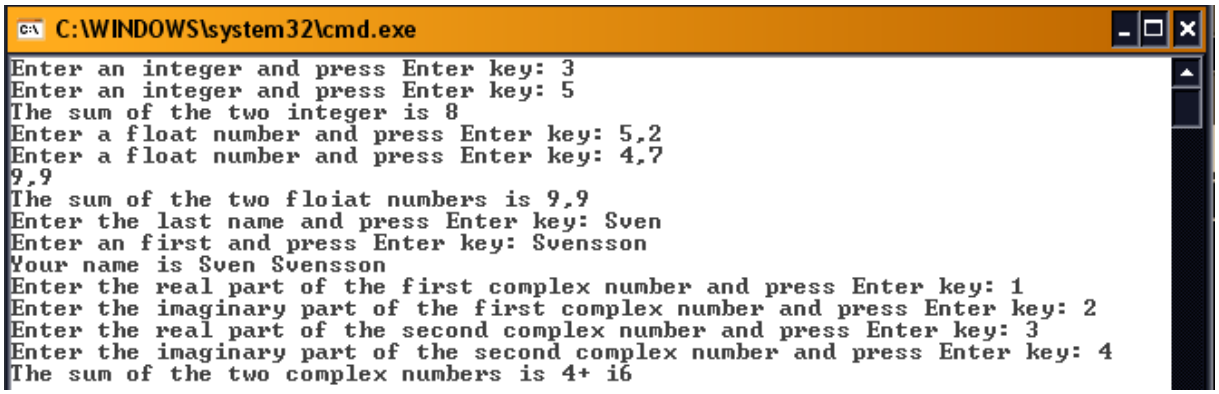
Note: the concept of complex numbers is irrelevant for program.

The output may be like this:



Requirements for grades:

Grade 3: 5 tasks solved.

Grade 4: 7 tasks solved

Grade 5: All tasks solved

If you have questions, mail me at:

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(Credits to Nazila)

Good Luck!