

#### Lab Exercise 6

## IT1050 – Object Oriented Concepts

**Semester 2, 2023** 

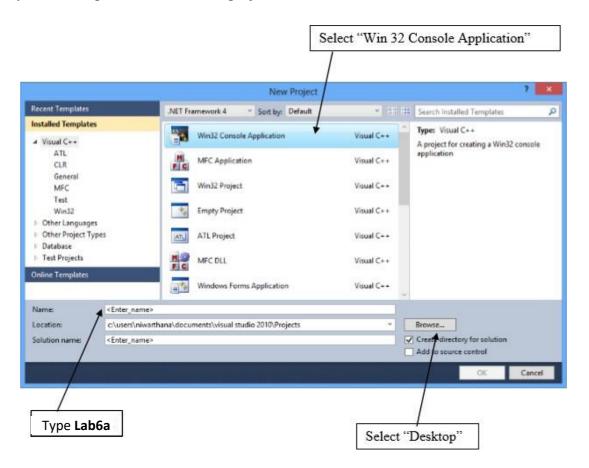
### Objectives:

• Creation of classes and method calling in Object Oriented Programming concepts.

#### **Exercise 1:**

In Exercise 1 we will implement the *Circle* class that can be helpful to calculate the area of a garden.

(a) In Visual C++, create a new Win32 Console Application project. Save the project in your Desktop. We will name the project as **Lab6a** 



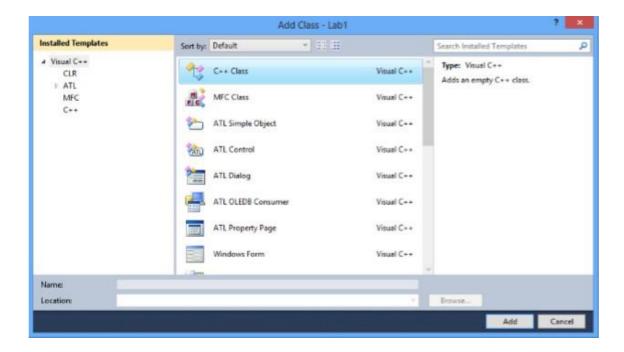


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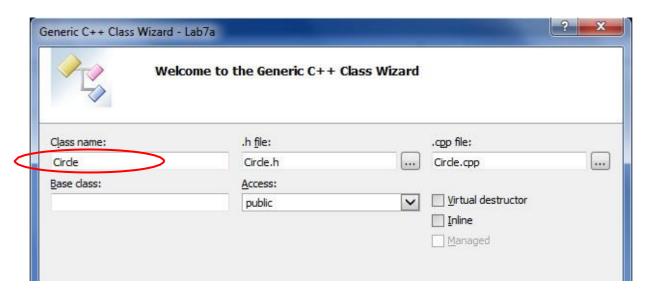
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b) Add a new Class to the project from the main menu select Project -> Add Class



Select the C++ Class Template.

(b) We will create a Class called Circle. When you specify the Class Name the Wizard creates the header file and the .cpp file.



Click the "Finish" button at the bottom of the "C++ Class Wizard"

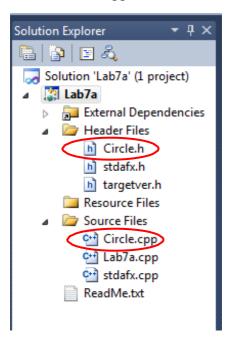


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Then you can see the **Circle.h** and the Circle.cpp files in the "Solution Explorer"



c) Write the definition of the Circle class in **Circle.h** header file. (Double click **Circle.h** from the Solution Explorer).

```
Circle.h X Circle.cpp Lab7a.cpp

(Global Scope)

#pragma once
□ class Circle
{
   private:
        double radius;

   public:
        void setRadius(double r);
        double getRadius();
        double calcArea();
        };
```

d) Implement Circle class in **Circle.cpp** (Double click on **Circle.cpp** from the Solution Explorer)



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```
Circle.cpp X Lab7a.cpp
Circle.h
  (Global Scope)
   □#include "StdAfx.h"
    #include "Circle.h"
    #include <iostream>
    using namespace std;
   ⊡void Circle::setRadius (double r)
    {
         radius = r;
   □double Circle::getRadius ()
    {
         return radius;
    }
   □double Circle::calcArea()
    {
         return 22.0/7*radius*radius;
    }
```

#### **Exercise 2:**

In Exercise 2 we will implement the *RectangleX* class that can be helpful to calculate the area of a garden.

- a) Add another Class to the project from the main menu select *Project -> Add Class*. Select the C++ Class Template.
- b) We will create a Class called *RectangleX*. When you specify the Class Name the Wizard creates the header file and the .cpp file.

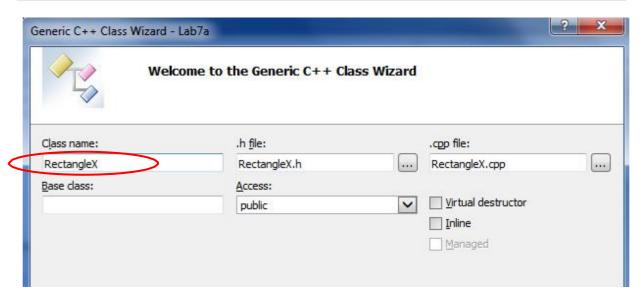
Note: Rectangle is a reserved word in C++. We can't use Rectangle as a class name instead of that use **RectangleX** as the class name



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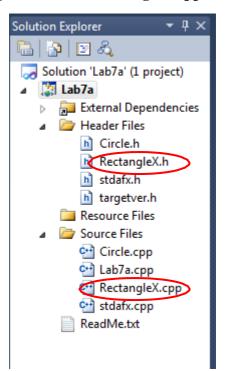
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Click the "Finish" button at the bottom of the "C++ Class Wizard"

Then you can see the **RectangleX.h** and the **RectangleX.cpp** files in the "Solution Explorer"





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c) Write the definition of the **RectangleX** class in **RectangleX.h** header file. (Double click **RectangleX.h** from the Solution Explorer).

```
RectangleX.h × RectangleX.cpp
                                 Circle.h
                                            Circle.cpp
  (Global Scope)
     #pragma once

☐ class RectangleX

     {
     private:
         double length;
         double width;
     public:
         void setLength( double 1);
         void setWidth( double w);
         double getLength();
         double getWidth();
         double calcArea();
    };
```

d) Implement *RectangleX* class in **RectangleX.cpp** (Double click on RectangleX.cpp from the Solution Explorer)



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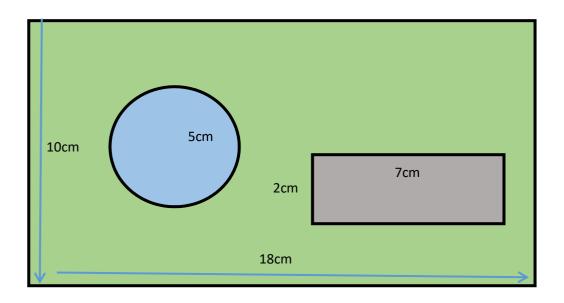
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```
RectangleX.cpp X Circle.h
                                         Circle.c
RectangleX.h
RectangleX
   ∃#include "StdAfx.h"
    #include "RectangleX.h"
    #include <iostream>
    using namespace std;
   void RectangleX::setLength ( double 1)
        length = 1;
   ⊡void RectangleX::setWidth ( double w)
    {
        width = w;
   double RectangleX::getLength()
    {
        return length;
   ⊡double RectangleX::getWidth ()
        return width;
   □double RectangleX::calcArea()
         return length * width;
```

#### **Exercise 3:**

Write the client program (main) in Lab06a.cpp to find the garden area (green colour) as shown in the diagram below.





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#### **Additional Exercise**

a) Implement a *Square* class that can be helpful to calculate the area of a square.

Follow the same steps as in Exercise 1 and Exercise 2 to implement the Square class accordingly. You may have to use,

Area of a square = length\*length

b) Modify the client program in Lab7a.cpp to add a square to the diagram as shown below and find the area shown in green.

