الجامعة المستنصرية / كلية العلوم

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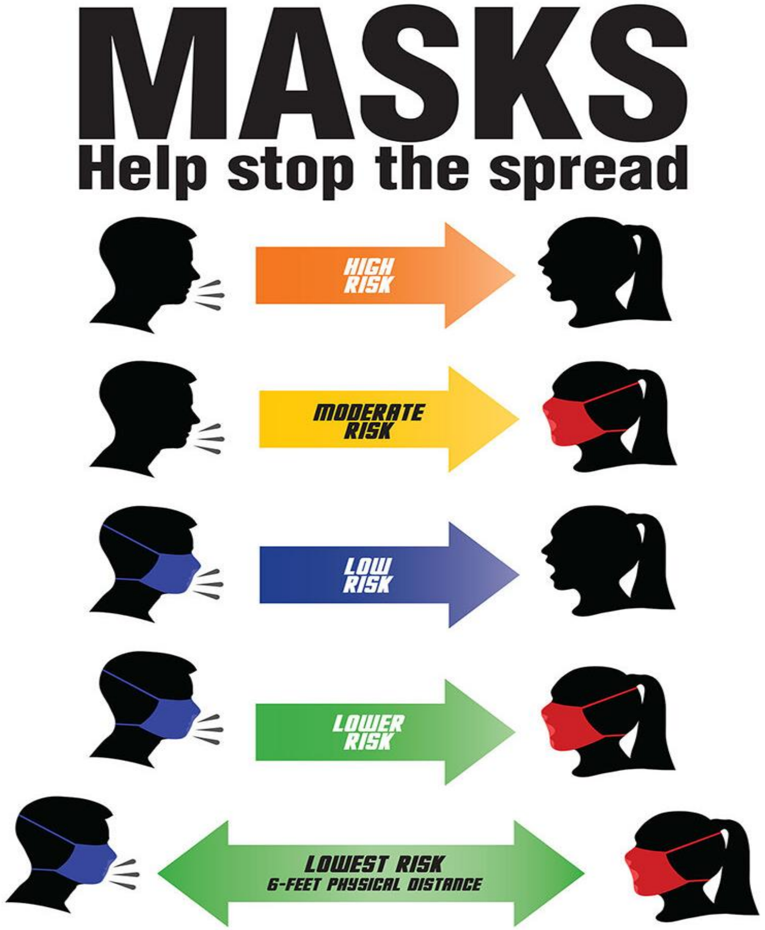


OOP

OBJECT-ORIENTED PROGRAMMING

6

Static
Class, Method

static means something which cannot be instantiated.

You cannot create an object of a static class and cannot access static members using an object. لا نستطيع خلق الكيان من الكلاس في البرنامج الرئيسي

We can use the static keyword for :
classes,
variables,
methods,
properties,
operators, and constructors.

1 Static Class

class

X

object

Rules for Static Class

A static class is declared by using the keyword static before the keyword class.

static class student

A static class cannot be instantiated. Static class has only static members.

- static class can contain

  static variables, static methods, static properties,
  static operators, static events and static constructors.

- destructors cannot be static

- Static class members can be accessed using ClassName.MemberName.

- Static classes are sealed class and therefore, cannot be inherited.

- static class cannot inherit from other classes.

```
static class calculator
{
  public  static string ctype = "Arithmetic";

  public  static int  sum(int num1, int num2)
  {
      return num1 + num2;
  }
}
```

the calculator class is a static. And All the members of it are also static.

You cannot create an object of the static class; therefore the members of the static class can be accessed directly using a class name like

calculator.ctype

```
using System;
namespace App12
{
    class Program1
    {
      static class calculator
      {
          public static string ctype = "Arithmetic";

          public static int sum(int num1, int num2)
          {
              return num1 + num2;
          }
      }
```

```
static void Main(string[] args)
{
  calculator result = new calculator();     // ERROR

  var calctype = calculator.ctype;
  Console.WriteLine(calculator.ctype);
  // accessing static variable

  calculator.ctype = "Scientific";
  //assign value to static variable
  Console.WriteLine(calculator.ctype);

  var result = calculator.sum(10, 25);
  // calling static method

  Console.ReadKey();
}
}
}
```

2 Static Fields / Methods

Static fields in a non-static class can be defined using the static keyword.

The normal class (non-static class) can contain one or more static methods, fields, properties, events and other non-static members

Static methods can be called without creating an object.

the static members can be accessed directly using class not object.

The static methods can only call other static methods and access static members.

You cannot access non-static members in the static methods.

Static methods can be overloaded but cannot be overridden.

```
class calculator
        {
            private static string ctype;
        }
```

the calculator class is a not static. But its member ctype is static.

the static members can be accessed directly using a class name like

calculator.ctype

```
using System;
namespace App12
{
    class Program1
    {
        class calculator
        {
            public static string ctype = "Arithmetic";

            public static int sum(int num1, int num2)
            {
                return num1 + num2;
            }


        }
```

```
static void Main(string[] args)
{
    calculator mycalc = new calculator();
    // CORRECT

    calculator.ctype = "Scientific";
    Console.WriteLine(calculator.ctype);

    int res = calculator.sum(1,2);
    Console.WriteLine(“SUM = ” + res);

    Console.ReadKey();
}
}
}
```

The output :

```
Scientific
SUM = 3
```

3 Static Constructors

A non-static class can contain a static constructor.

static constructor can be defined with the static keyword and without access modifiers

```
using System;
namespace ConsoleApp12
{
    class Program1
    {
      public class calculator
      {
          private static string ctype;

          static calculator()
          {
              Console.WriteLine("STATIC CONSTRUCTOR");
              ctype="Arithmetic";
              Console.WriteLine(ctype);
          }

          public static int sum(int a, int b)
          {
              return  a + b;
          }
      }
```

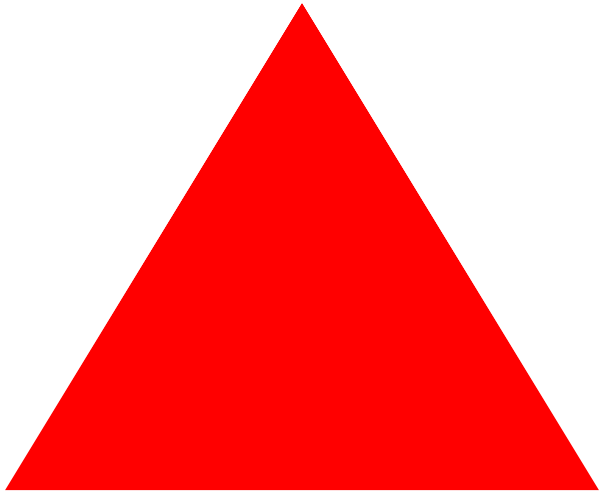
```
static void Main(string[] args)
{
   calculator mycalc = new calculator();



   int s = calculator.sum(1,2);
   Console.WriteLine("SUM =" + s);

   Console.ReadKey();
}
   }
}
```

The output :

```
STATIC CONSTRUCTOR
Arithmetic
```

H.W.

Write a C# complete program to find the area of tringle with static class



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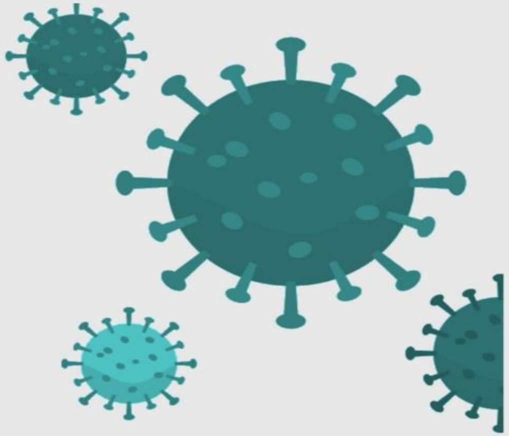

طرق
الوقايا من
فايروس
كورونا

احرص دائما على تطهير يديك بعد
ملامسة الأسطح في الأماكن العامة

عند السعال والعطس قم بوضع منديل
والتخلص منه عند الإنتهاء في سلة المهملات

قم بتطهير وتنظيف الأسطح التي تلامسها بشكل مُتكرر

غسل اليدين بالماء والصابون لمدة
لا تقل عن 20 ثانية بشكل متكرر

ارتدِ قناعا واقيا كإجراء وقائي
في المستشفيات والأماكن المغلقة