



SINGLETON

Design Pattern





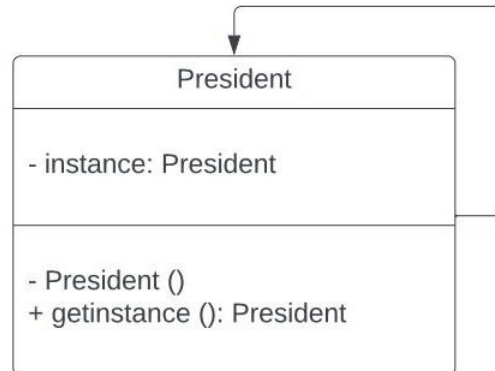
INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD

Report

Name: Tamoor Ahmad
Registration No: 4125-FBAS/BSSE/F20
Course Code: SE322
Course Title: Software Design and Architecture

Submitted to: Dr. Muhammad Nasir

Class Diagram:



1. **Write a program that represents an organizational hierarchy. Consider that there is only one president in this organization. You are supposed to make sure that only one instance of president class is created in this program.**

Source Code:

```
using System;
namespace President.Structural
{

    public class President
    {
        static President instance;

        protected President()
        {
        }
        public static President Instance()
        {
            if (instance != null)
            {
                Console.WriteLine("Instance of president class was already created");
            }
        }
    }
}
```

```
        else if (instance == null)
        {
            instance = new President();
            Console.WriteLine("Instance of president class has been created");
        }

        return instance;
    }
}
public class Program
{
    public static void Main(string[] args)
    {
        President p1 = President.Instance();

        Console.ReadKey();
    }
}
```

Output:

Select C:\Users\ITS\source\repos\Singleton\Singleton\bin\Debug\Singleton.exe
Instance of president class has been created

2. Extending the program in exercise#1, consider that there are four directors in this organization. You are supposed to make sure that four instances of directors (starting from 1 to 4) are created.

Source Code:

```
using System;
namespace Director.Structural
{

    public class Director
    {
        static Director instance;

        protected Director()
        {
        }
        public static Director Instance(ref int count)
        {
            if (count < 4)
            {
                instance = new Director();
                Console.Write(count + 1);
                Console.WriteLine(" Instance of Director class has been created");
            }
            else if (count >= 4)
            {
                Console.WriteLine("Cannot create more than 4 Directors");
            }

            return instance;
        }
    }
    public class Program
    {
        public static void Main(string[] args)
        {
            int count = 0;

            Director p1 = Director.Instance(ref count);
            count++;
            Director p2 = Director.Instance(ref count);
            count++;
            Director p3 = Director.Instance(ref count);
            count++;
            Director p4 = Director.Instance(ref count);
            count++;
            Director p5 = Director.Instance(ref count);
            count++;

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

Output:

Select C:\Users\ITS\source\repos\Singleton\Singleton\bin\Debug\Singleton.exe

```
1 Instance of Director class has been created
2 Instance of Director class has been created
3 Instance of Director class has been created
4 Instance of Director class has been created
Cannot create more than 4 Directors
```

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