APPLICATION PROGRAMMING

LABORATORY MANUAL

B.TECH

(IV YEAR – I SEM)

(2019-20)

DEPARTMENT OF INFORMATION TECHNOLOGY

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Recognized under 2(f) and 12 (B) of UGC ACT 1956

(Affiliated to JNTUH, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)

Maisammaguda, Dhulapally (Post Via. Hakimpet), Secunderabad – 500100, Telangana State, India

DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

- To improve the quality of technical education that provides efficient software engineers with an attitude to adapt challenging IT needs of local, national and international arena, through teaching and interaction with alumni and industry.

MISSION

- Department intends to meet the contemporary challenges in the field of IT and is playing a vital role in shaping the education of the 21st century by providing unique educational and research opportunities.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1 – ANALYTICAL SKILLS

To facilitate the graduates with the ability to visualize, gather information, articulate, analyze, solve complex problems, and make decisions. These are essential to address the challenges of complex and computation intensive problems increasing their productivity.

PEO2 – TECHNICAL SKILLS

To facilitate the graduates with the technical skills that prepare them for immediate employment and pursue certification providing a deeper understanding of the technology in advanced areas of computer science and related fields, thus encouraging to pursue higher education and research based on their interest.

PEO3 – SOFT SKILLS

To facilitate the graduates with the soft skills that include fulfilling the mission, setting goals, showing self-confidence by communicating effectively, having a positive attitude, get involved in team-work, being a leader, managing their career and their life.

PEO4 – PROFESSIONAL ETHICS

To facilitate the graduates with the knowledge of professional and ethical responsibilities by paying attention to grooming, being conservative with style, following dress codes, safety codes, and adapting themselves to technological advancements.

PROGRAM SPECIFIC OUTCOMES (PSOs)

After the completion of the course, B. Tech Information Technology, the graduates will have the following Program Specific Outcomes:

1. **Fundamentals and critical knowledge of the Computer System:-** Able to Understand the working principles of the computer System and its components , Apply the knowledge to build, asses, and analyze the software and hardware aspects of it .

2. **The comprehensive and Applicative knowledge of Software Development:** Comprehensive skills of Programming Languages, Software process models, methodologies, and able to plan, develop, test, analyze, and manage the software and hardware intensive systems in heterogeneous platforms individually or working in teams.

3. **Applications of Computing Domain & Research:** Able to use the professional, managerial, interdisciplinary skill set, and domain specific tools in development processes, identify the research gaps, and provide innovative solutions to them.

PROGRAM OUTCOMES (POs)

Engineering Graduates should possess the following:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design / development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.
12. **Life- long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

Maisammaguda, Dhulapally Post, Via Hakimpet, Secunderabad – 500100

DEPARTMENT OF INFORMATION TECHNOLOGY

GENERAL LABORATORY INSTRUCTIONS

1. Students are advised to come to the laboratory at least 5 minutes before (to the starting time), those who come after 5 minutes will not be allowed into the lab.
2. Plan your task properly much before to the commencement, come prepared to the lab with the synopsis / program / experiment details.
3. Student should enter into the laboratory with:

a. Laboratory observation notes with all the details (Problem statement, Aim, Algorithm, Procedure, Program, Expected Output, etc.,) filled in for the lab session.

b. Laboratory Record updated up to the last session experiments and other utensils (if any) needed in the lab.

c. Proper Dress code and Identity card.

4. Sign in the laboratory login register, write the TIME-IN, and occupy the computer system allotted to you by the faculty.
5. Execute your task in the laboratory, and record the results / output in the lab observation note book, and get certified by the concerned faculty.
6. All the students should be polite and cooperative with the laboratory staff, must maintain the discipline and decency in the laboratory.
7. Computer labs are established with sophisticated and high end branded systems, which should be utilized properly.
8. Students / Faculty must keep their mobile phones in SWITCHED OFF mode during the lab sessions. Misuse of the equipment, misbehaviors with the staff and systems etc., will attract severe punishment.
9. Students must take the permission of the faculty in case of any urgency to go out; if anybody found loitering outside the lab / class without permission during working hours will be treated seriously and punished appropriately.
10. Students should LOG OFF/ SHUT DOWN the computer system before he/she leaves the lab after completing the task (experiment) in all aspects. He/she must ensure the system / seat is kept properly.

HEAD OF THE DEPARTMENT **PRINCIPAL**

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WEEK 1 **DATE:**

Aim:
Learning to use Visual Studio 2010 IDE
Building Console Application Project

Description:

A console application is a computer program designed to be used via a text-only computer interface, such as a text terminal, the command line interface of some operating systems (Unix, DOS, etc.) or the text-based interface included with most Graphical User Interface (GUI) operating systems, such as the Win32 console in Microsoft Windows, the Terminal in Mac OS X, and xterm in Unix. A user typically interacts with a console application using only a keyboard and display screen, as opposed to GUI applications, which normally require the use of a mouse or other pointing device. Many console applications such as command line interpreters are command line tools, but numerous text-based user interface (TUI) programs also exist.

The ability to create console applications is kept as a feature of modern programming environments such as Visual Studio and the .NET Framework on Microsoft Windows because it greatly simplifies the learning process of a new programming language by removing the complexity of a graphical user interface

For data processing tasks and computer administration, these programming environments represent the next level of operating system or data processing control after scripting. If an application is only going to be run by the original programmer and/or a few colleagues, there may be no need for a pretty graphical user interface, leaving the application leaner, faster and easier to maintain.

Console-based applications include Alpine (an e-mail client), cmus (an audio player), Irssi (an IRC client), Lynx (a web browser), Midnight Commander (a file manager), Music on Console (an audio player), Mutt (an e-mail client), nano (a text editor), ne (a text editor), newsbeuter (an RSS reader), and ranger (a file manager).

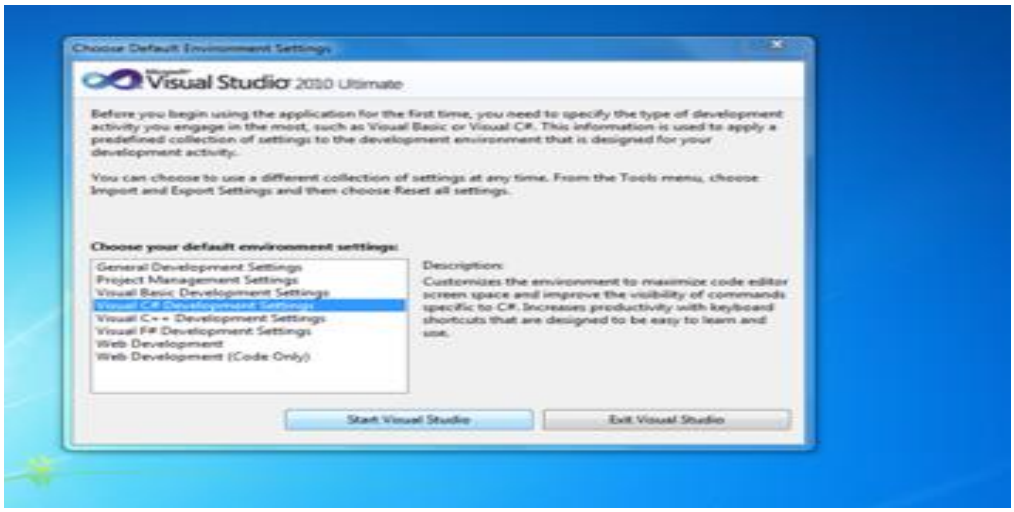
Installation Visual Studio 2010 IDE

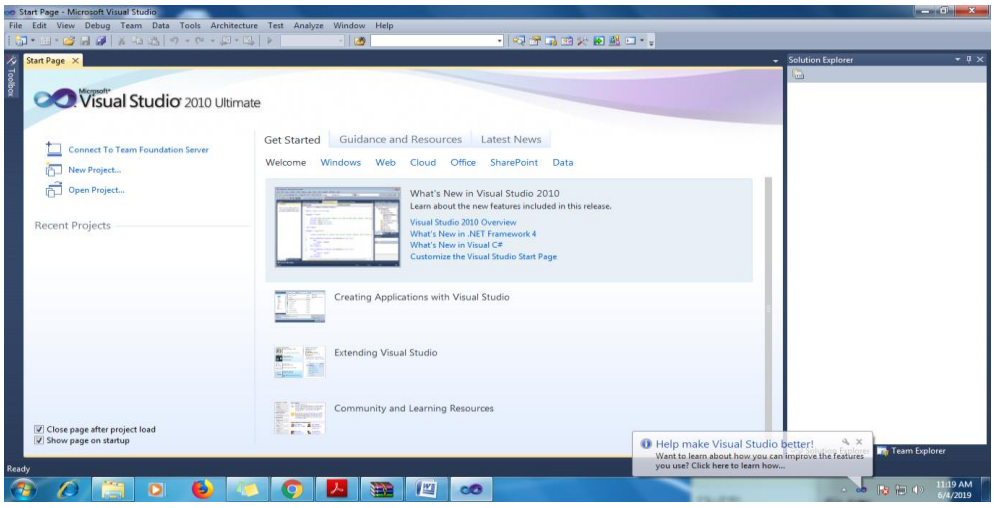
If you haven't already installed Visual Studio, go to the Visual Studio downloads page to install it for free.

Create a project

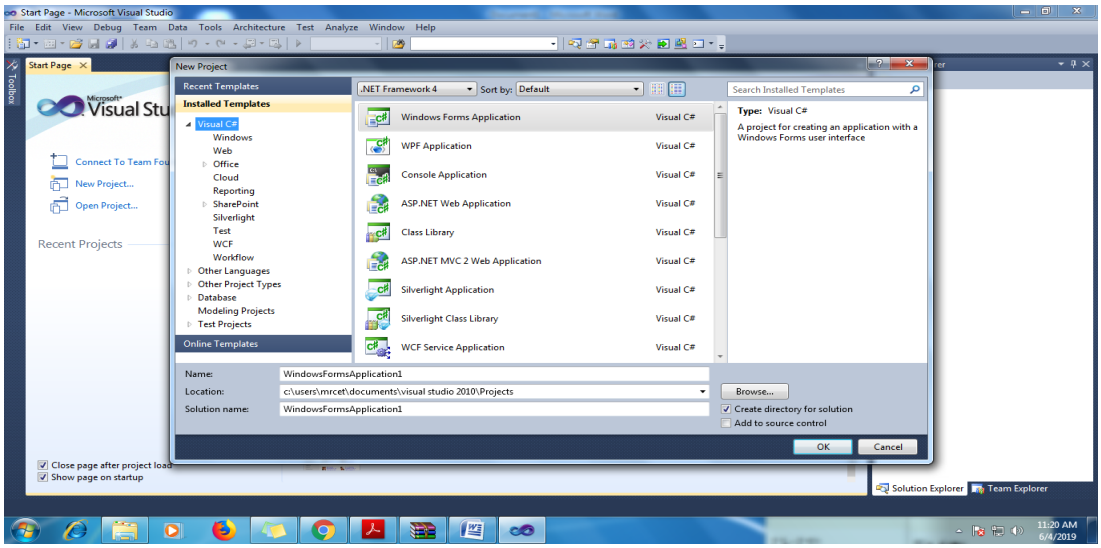
First, you'll create a C# application project. The project type comes with all the template files you'll need, before you've even added anything!

1. Open Visual Studio 2010.
2. On the start window, choose **Create a new project**.

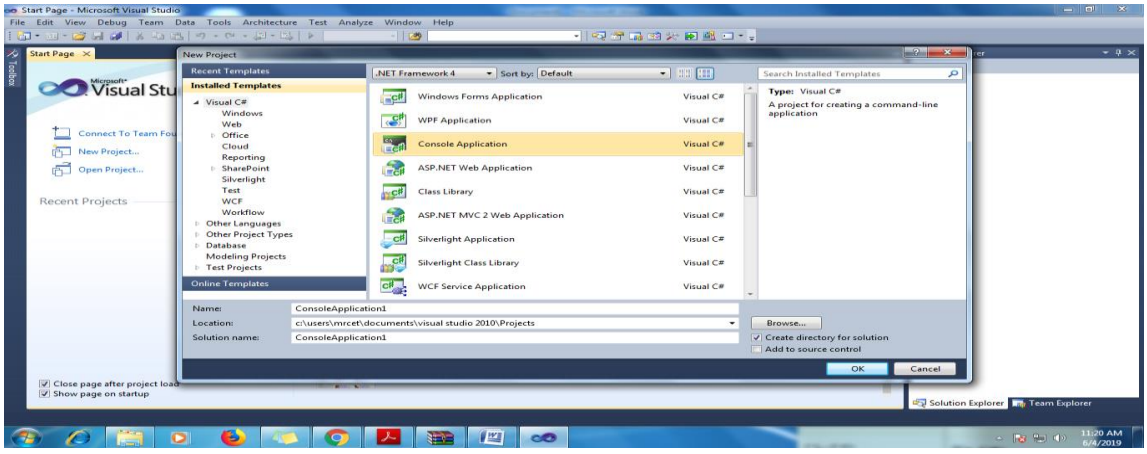




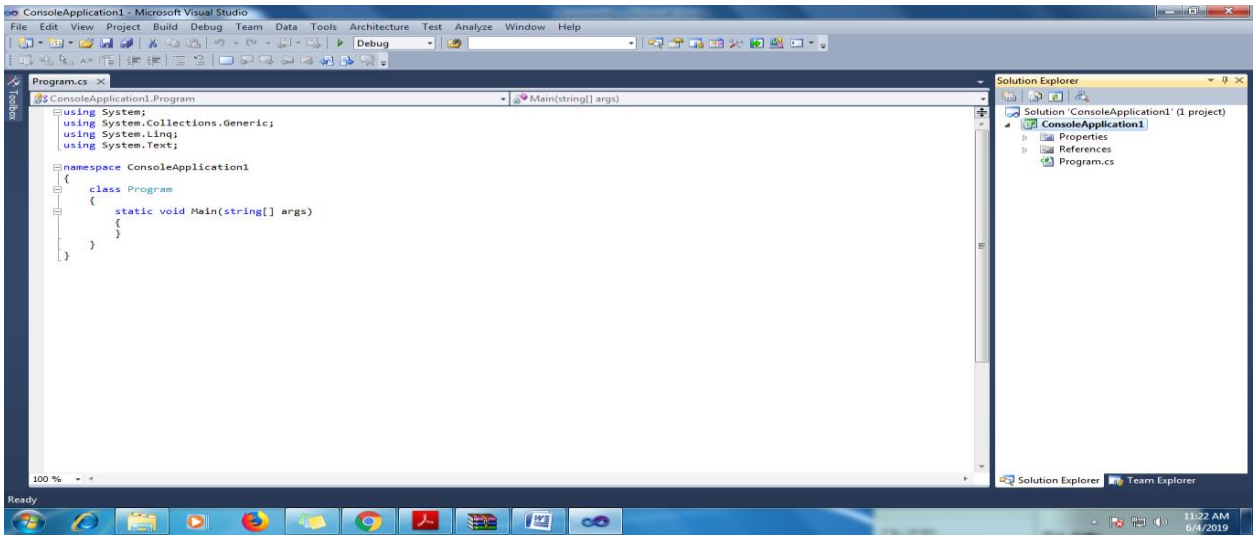
On the **Create a new project** window, enter or type *console* in the search box. Next, choose **C#**from the Language list, and then choose **Windows** from the Platform list.



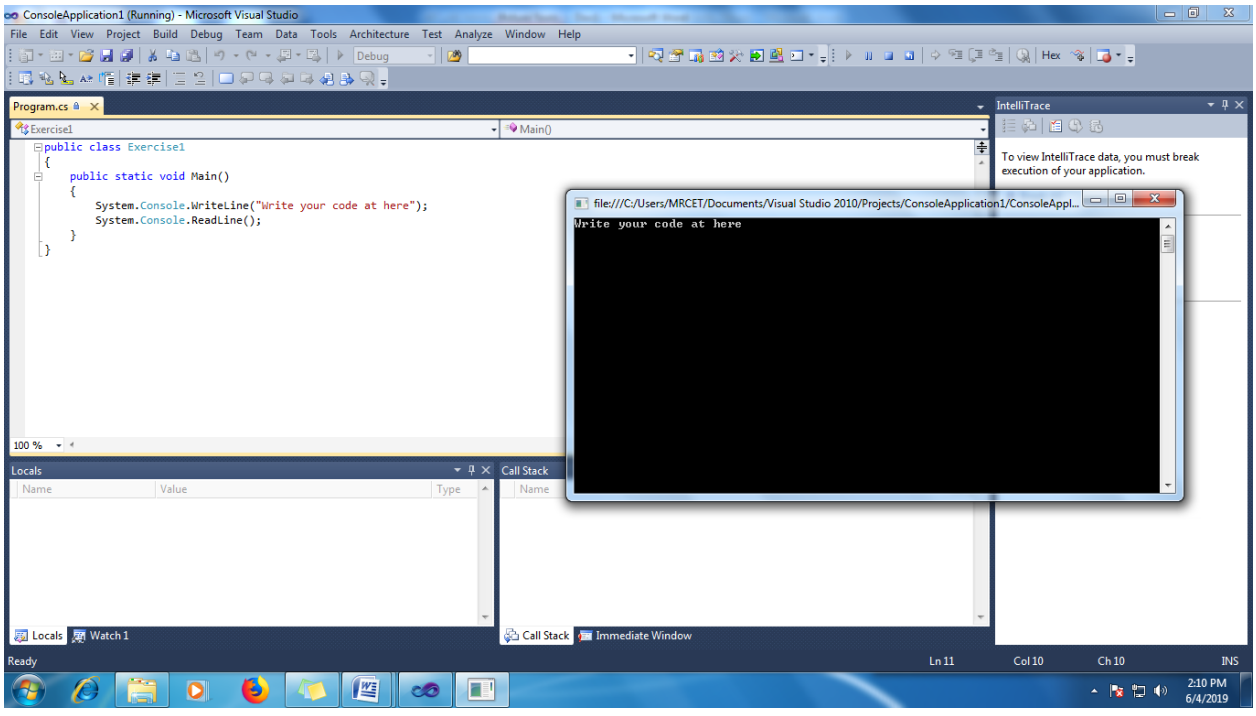
After you apply the language and platform filters, choose the **Console App (.NET Core)**template, and then choose **Next**.



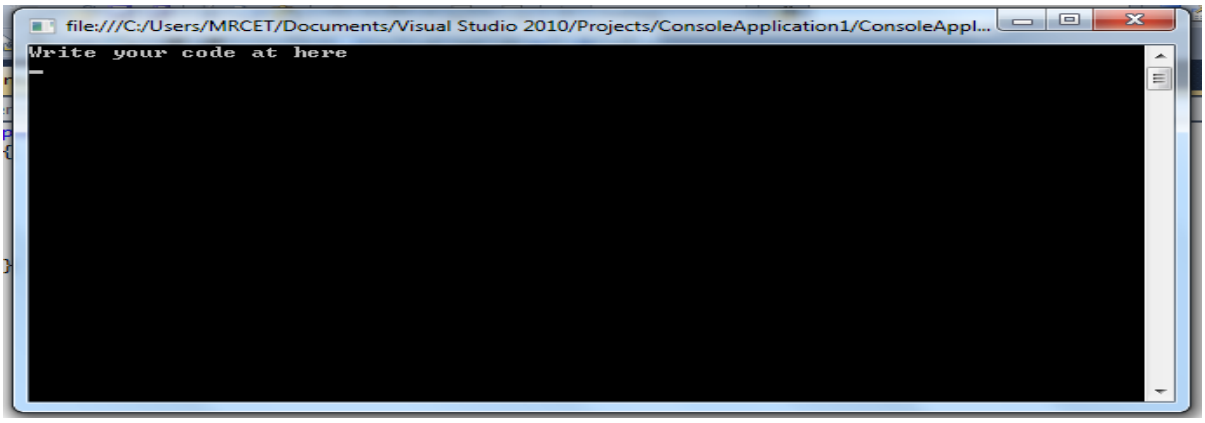
In the **Configure your new project** window, type or enter *HelloWorld* in the **Project name** box. Then, choose **Create**.



If you press **F5**, you can run the program in Debug mode. However, the console window is visible only for a moment before it closes.



View your Output in the console window.



Close the application

1. Press **ENTER** to close the console window.
2. Close the **Output** pane in Visual Studio.

WEEK-2: **DATE:**

a) Write a Program to generate the factorial of a given number by using command line argument
b) Write a Program to generate Fibonacci series
c) Write a program to generate the temperature conversion

a) Aim: To implement a Program to generate the factorial of a given number by using command line argument

Program

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;

namespace factorial
{
   class Program
   {
      static void Main(string[] args)
      {
```

```
            int i, number, fact;
            Console.WriteLine("Enter the Number");



            number = int.Parse(Console.ReadLine());
            fact = number;
            for (i = number - 1; i >= 1; i--)
            {
               fact = fact * i;
            }
            Console.WriteLine("\nFactorial of Given Number is: "+fact);
            Console.ReadLine();

         }
      }
   }
```

Output

Signature of the Faculty

b) **Aim:** To implement a Program to generate Fibonacci series

Program

```
using System;
  public class FibonacciExample
       {
         public static void Main(string[] args)
          {
            int n1=0,n2=1,n3,i,number;
```

```
        Console.Write("Enter the number of elements: ");
        number = int.Parse(Console.ReadLine());
        Console.Write(n1+" "+n2+" "); //printing 0 and 1
        for(i=2;i<number;++i) //loop starts from 2 because 0 and 1 are already printed
        {
         n3=n1+n2;



         Console.Write(n3+" ");
        n1=n2;
         n2=n3;
        }
      }
    }
```

Output

Signature of the Faculty

c) **Aim**:Implement a program to generate the temperature conversion

Program

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;

namespace program
{
    class Program
    {
        static void Main(string[] args)
        {
            int celsius, faren;
            Console.WriteLine("Enter the Temperature in Celsius(°C) : ");
```

```
            celsius = int.Parse(Console.ReadLine());
            faren = (celsius * 9) / 5 + 32;
            Console.WriteLine("0Temperature in Fahrenheit is(°F) : " + faren);
            Console.ReadLine();

        }
    }
}
```

Output

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WEEK 3 **DATE:**

a) Write a program to generate Pascal Triangle .
b) Write a program which asks for a symbol and a width, and displays a triangle of that width, using that number for the inner symbol
c) Write a program that takes a number and a width also a number, as input and then displays a triangle of that width, using that number.

a) **Aim**:Implement a program to generate the Pascal Triangle

Program

```
using System;
using System.Collections.Generic;
using System.Text;
namespace PascalTriangle
{
  class PascalTriangle
  {
    static void Main(string[] args)
    {
      System.Console.WriteLine("Pascal Triangle Program");

      System.Console.Write("Enter the number of rows: ");
```

```
        string input = System.Console.ReadLine();
       int n = Convert.ToInt32(input);
        for (int y = 0; y < n; y++)
        {
          int c = 1;

          for (int q = 0; q < n - y; q++)
          {
            System.Console.Write("   ");
          }

          for (int x = 0; x <= y; x++)
          {
            System.Console.Write("   {0:D} ", c);

            c = c * (y - x) / (x + 1);
            }

          System.Console.WriteLine();
          System.Console.WriteLine();
        }
        System.Console.WriteLine();
      }
    }
}
```

Output

Signature of the Faculty

b)**Aim**:Implement a program to generate a program which asks for a symbol and a width, and displays a triangle of that width, using that number for the inner symbol

Program

```
using System;
public class Exercise33
{
   public static void Main()
{
   int no_row,c=1,blk,i,j;

         Console.Write("\n\n");
   Console.Write("Display the Pascal's triangle:\n");
   Console.Write("--------------------------------");
   Console.Write("\n\n");

   Console.Write("Input number of rows: ");
   no_row = Convert.ToInt32(Console.ReadLine());

   for(i=0;i<no_row;i++)
   {
      for(blk=1;blk<=no_row-i;blk++)
      Console.Write("  ");
      for(j=0;j<=i;j++)
      {
         if (j==0||i==0)
            c=1;
         else
           c=c*(i-j+1)/j;
         Console.Write("{0}   ",c);
      }
      Console.Write("\n");
   }
  }
}
```

Output

Signature of the Faculty

c)Aim: Implement C# Sharp program that takes a number and a width also a number, as input and then displays a triangle of that width, using that number.

Program

```
using System;
public class Exercise2
{
  public static void Main()
  {
   Console.Write("Input a number: ");
   int num = Convert.ToInt32( Console.ReadLine() );

   Console.Write("Input the desired width: ");
   int width = Convert.ToInt32( Console.ReadLine() );

   int height = width;
   for (int row=0; row < height; row++)
   {
    for (int column=0; column < width; column++)
   {
   Console.Write( num );
  }

   Console.WriteLine();
   width--;
  }
 }
}
```

Output

Signature of the Faculty

WEEK 4 **DATE:**

a) Write a program to find the second highest value in an array
b) Write a program that at accept an array and a number to be searched in an array if found display proper message and its position in a array

a) **Aim**:Implement a program to Find the Second Highest Value in an Array

Program

```
using System;
public class Exercise16
{
   public static void Main()
  {
    int n,i,j=0,lrg,lrg2nd;
          int[] arr1 = new int[50];

      Console.Write("\n\nFind the second largest element in an array :\n");
      Console.Write("----------------------------------------\n");

      Console.Write("Input the size of array : ");
            n = Convert.ToInt32(Console.ReadLine());
   /* Stored values into the array*/
      Console.Write("Input {0} elements in the array :\n",n);

      for(i=0;i<n;i++)
          {
              Console.Write("element - {0} : ",i);
                    arr1[i] = Convert.ToInt32(Console.ReadLine());
             }
/* find location of the largest element in the array */
   lrg=0;

  for(i=0;i<n;i++)
  {
     if(lrg<arr1[i])
           {
         lrg=arr1[i];
         j = i;
     }
  }
/* ignore the largest element and find the 2nd largest element in the array */
```

```
 lrg2nd=0;
for(i=0;i<n;i++)
{
  if(i==j)
    {
     i++;  /* ignoring the largest element */
     i--;
    }
   else
    {
      if(lrg2nd<arr1[i])
            {
         lrg2nd=arr1[i];
        }
    }
}

 Console.Write("The Second largest element in the array is :  {0} \n\n", lrg2nd);
}
}
```

Output

Signature of the Faculty

b) **Aim**: Implement a program that at accept an array and a number to be searched in an array if found display proper message and its position in a array

Program

```
using System;
namespace ArrayApplication {
  class MyArray {
    static void Main(string[] args) {
      int []  n = new int[10]; /* n is an array of 10 integers */
      int i,j;

      /* initialize elements of array n */
```

```
        for ( i = 0; i < 10; i++ ) {
          n[ i ] = i + 100;
        }

        /* output each array element's value */
        for (j = 0; j < 10; j++ ) {
          Console.WriteLine("Element[{0}] = {1}", j, n[j]);
        }
        Console.ReadKey();
      }
    }
}
```

Output

Signature of the Faculty

WEEK 5 **DATE:**

a) Write a console program to develop tic-tac toe game
b) Create a function named "ChangeChar" to modify a letter in a certain position (0 based) of a string, replacing it with a different letter ex: ChangeChar(“crush”,2,’a’)

a) **Aim**: Implement a console program to develop tic-tac toe game

Program

```
using System;
using System.Threading;
 namespace TIC_TAC_TOE
{
   class Program
   {
     static char[] arr = { '0', '1', '2', '3', '4', '5', '6', '7', '8', '9' };
     static int player = 1;
     static int choice;
     static int flag = 0;
     static void Main(string[] args)
      {
```

```
        do
        {
            Console.Clear();
            Console.WriteLine("Player1:X and Player2:O");
            Console.WriteLine("\n");
            if (player % 2 == 0)
            {
              Console.WriteLine("Player 2 Chance");
            }
            else
            {
               Console.WriteLine("Player 1 Chance");
            }
            Console.WriteLine("\n");
            Board();
            choice = int.Parse(Console.ReadLine());
            if (arr[choice] != 'X' && arr[choice] != 'O')
            {
               if (player % 2 == 0) //if chance is of player 2 then mark O else mark X
               {
                  arr[choice] = 'O';
                  player++;
               }
               else
               {
                  arr[choice] = 'X';
                  player++;
               }
            }
            else
            {
               Console.WriteLine("Sorry the row {0} is already marked with {1}", choice,
arr[choice]);
               Console.WriteLine("\n");
               Console.WriteLine("Please wait 2 second board is loading again.....");
               Thread.Sleep(2000);
            }
            flag = CheckWin();
        } while (flag != 1 && flag != -1);
        Console.Clear();
```

```
    Board();
    if (flag == 1)
    {
        Console.WriteLine("Player {0} has won", (player % 2) + 1);
    }
    else
    {
        Console.WriteLine("Draw");
    }
   Console.ReadLine();
}
private static void Board()
{
    Console.WriteLine("     |     |      ");

    Console.WriteLine("  {0}  |  {1}  |  {2}", arr[1], arr[2], arr[3]);

    Console.WriteLine("_____|_____|_____ ");

    Console.WriteLine("     |     |      ");

    Console.WriteLine("  {0}  |  {1}  |  {2}", arr[4], arr[5], arr[6]);

    Console.WriteLine("_____|_____|_____ ");

    Console.WriteLine("     |     |      ");

    Console.WriteLine("  {0}  |  {1}  |  {2}", arr[7], arr[8], arr[9]);

    Console.WriteLine("     |     |      ");

}
private static int CheckWin()
{

    #region Horzontal Winning Condtion
    //Winning Condition For First Row
    if (arr[1] == arr[2] && arr[2] == arr[3])
    {
        return 1;
```

```
}
//Winning Condition For Second Row
else if (arr[4] == arr[5] && arr[5] == arr[6])
{
   return 1;
}
//Winning Condition For Third Row
else if (arr[6] == arr[7] && arr[7] == arr[8])
{
   return 1;
}
#endregion
 #region vertical Winning Condtion
//Winning Condition For First Column
else if (arr[1] == arr[4] && arr[4] == arr[7])
{
   return 1;
}
//Winning Condition For Second Column
else if (arr[2] == arr[5] && arr[5] == arr[8])
{
   return 1;
}
//Winning Condition For Third Column
else if (arr[3] == arr[6] && arr[6] == arr[9])

{
  return 1;
}
#endregion
#region Diagonal Winning Condition
else if (arr[1] == arr[5] && arr[5] == arr[9])
{
   return 1;
}
else if (arr[3] == arr[5] && arr[5] == arr[7])
{
   return 1;
}
#endregion
```

```
            #region Checking For Draw
            else if (arr[1] != '1' && arr[2] != '2' && arr[3] != '3' && arr[4] != '4' && arr[5] != '5'
&& arr[6] != '6' && arr[7] != '7' && arr[8] != '8' && arr[9] != '9')

            {
               return -1;
            }
            #endregion
            else
            {
               return 0;
            }

         }
      }

}
```

Output

Signature of the Faculty

b) Aim: Create a function named "ChangeChar" to modify a letter in a certain position (0 based) of a string, replacing it with a different letter ex: ChangeChar(“crush”,2,’a’)

Program

```
using System;
class ChangChar
{
   public static void ChangeChar(ref string text, int position, char letter)
   {
      text = text.Remove(position, 1);
      text = text.Insert(position, letter.ToString());
```

```
    }

    public static void Main()
    {
        string sentence = "Tomato";
        ChangeChar(ref sentence, 5, 'a');
    }
}
```

Output

Signature of the Faculty

WEEK 6 **DATE:**

a) Create a base class, Telephone, and derive a class ElectronicPhone from it. In Telephone, create a protected string member phonetype, and a public method Ring( ) that outputs a text message like this: "Ringing the <phonetype>." In ElectronicPhone, the constructor should set the phonetype to "Digital." In the Run( ) method, call Ring( ) on the ElectronicPhone to test the inheritance.

b) Extend above Exercise to illustrate a polymorphic method. Have the derived class override the Ring( ) method to display a different message

c) Change the Telephone class to abstract, and make Ring( ) an abstract method. Derive two new classes from Telephone: DigitalPhone and TalkingPhone. Each derived class should set the phonetype, and override the Ring( ) method.

a) **Aim**: Implement a base class, Telephone, and derive a class ElectronicPhone to test the inheritance.

Program

```
using System;

class telephone
{
  protected string phonetype;

  public void ring()
  {
```

```
    Console.WriteLine("ringing the {0} phone ...", phonetype);
  }
}

class electronicphone : telephone
{
  public electronicphone()
  {
    phonetype = "digital";
  }

  public void run()
  {
    ring();
  }
}

class Test
{
  static void Main()
  {
     electronicphone ep = new electronicphone();
     ep.run();
     Console.ReadKey();
  }
}
```

Output

Signature of the Faculty

b) **Aim**: Implement a program to illustrate a polymorphic method. Have the derived class override the Ring( ) method to display a different message

Program

```
using System;

class telephone
{
  protected string phonetype;
```

```
  public virtual void ring()
  {
    Console.WriteLine("ringing the {0} ...", phonetype);
  }
}

class electronicphone : telephone
{
  public electronicphone()
  {
    phonetype = "digital";
  }

  public void run()
  {
    ring();
  }

  public override void ring()
  {
    Console.WriteLine("the {0} phone is using a different ring-tone ...", phonetype);
  }
}

class Test
{
  static void Main()
  {
     electronicphone ep = new electronicphone();
     ep.run();
     Console.ReadKey();
  }
}
```

Output

Signature of the Faculty

c**)** **Aim**: Implement to Change the Telephone class to abstract, and make Ring( ) an abstract method.

Program

```
using System;

abstract class telephone
{
  protected string phonetype;

  public abstract void ring();
}

class digitalphone : telephone
{
  public digitalphone()
  {
    phonetype = "digital";
  }

  public override void ring()
  {
    Console.WriteLine("ringing the {0} phone ...", phonetype);
  }

  public void run()
  {
    ring();
  }
}

class talkingphone : telephone
{
  public talkingphone()
  {
    phonetype = "talking";
  }

  public override void ring()
  {
    Console.WriteLine("ringing the {0} phone ...", phonetype);
  }

  public void run()
  {
    ring();
```

```
  }
}

class Test
{
  static void Main()
  {
     digitalphone dp = new digitalphone();
     dp.run();
     talkingphone tp = new talkingphone();
     tp.run();
     Console.ReadKey();
  }
}
```

Output

Signature of the Faculty

WEEK 7 **DATE:**

a) Write a program for example of try and catch block. In this check whether the given array size is negative or not.
b) Write a program to illustrate usage of try multiple catch with finally clause

c) Write a program for creation of user defined exception to show whether candidate is eligible to caste vote .

a) Aim:Implement a program for example of try and catch block.

Program

```
class Program
{
   static void Main(string[] args)
   {
      Student newStudent = null;

      try
      {
         newStudent = new Student();
```

```
            newStudent.StudentName = "James007";

            ValidateStudent(newStudent);
        }
        catch(InvalidStudentNameException ex)
        {
            Console.WriteLine(ex.Message );
        }


        Console.ReadKey();
    }

    private static void ValidateStudent(Student std)
    {
        Regex regex = new Regex("^[a-zA-Z]+$");

        if (!regex.IsMatch(std.StudentName))
            throw new InvalidStudentNameException(std.StudentName);
    }
}
```

Output

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b) **Aim**: Implement a program to illustrate usage of try multiple catch with finally clause

Program

```
using System;
class GFG {

        static void Main()
        {
                int[] number = { 8, 17, 24, 5, 25 };
                int[] divisor = { 2, 0, 0, 5 };

                // --------- try block ---------

                for (int j = 0; j < number.Length; j++)

                        // Here this block raises two different
                        // types of exception, i.e. DivideByZeroException
```

```
                        // and IndexOutOfRangeException
                        try {

                                Console.WriteLine("Number: " + number[j]);
                                Console.WriteLine("Divisor: " + divisor[j]);
                                Console.WriteLine("Quotient: " + number[j] / divisor[j]);
                        }

                        // Catch block 1

                        // This Catch block is for
                        // handling DivideByZeroException
                        catch (DivideByZeroException) {

                                Console.WriteLine("Not possible to Divide by zero");
                        }


                        // Catch block 2

                        // This Catch block is for
                        // handling IndexOutOfRangeException
                        catch (IndexOutOfRangeException) {
                                Console.WriteLine("Index is Out of Range");
                        }
        }
}
```

Output

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Aim: C# program to demonstrate finally

Program

```
using System;
class Geek {
        static void A()
        {
                try {
```

```
                Console.WriteLine("Inside A");
                throw new Exception("Throwing Exception");
            }
            finally
            {
                Console.WriteLine("A's finally");
            }
        }
        static void B()
        {

            try {

                Console.WriteLine("Inside B");
                return;
            }

            finally
            {
                Console.WriteLine("B's finally");
            }
        }

public static void Main(String[] args)
{
        try {

            A();
        }

        catch (Exception) {

            Console.WriteLine("Exception Caught");
        }
        B();
}
}
```

Output

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c) **Aim**: Implement a program for creation of user defined exception to show whether candidate is eligible to caste vote.

Program

```
using System;
public class InvalidAgeException : Exception
{
   public InvalidAgeException(String message)
      : base(message)
   {

   }
}
public class TestUserDefinedException
{
   static void validate(int age)
   {
      if (age < 18)
      {
         throw new InvalidAgeException("Sorry, Age must be greater than 18");
      }
   }
   public static void Main(string[] args)
   {
      try
      {
         validate(12);
      }
      catch (InvalidAgeException e) { Console.WriteLine(e); }
      Console.WriteLine("Rest of the code");
   }
}
```

Output

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WEEK 8 **DATE:**

a) Create a console application that displays current date a time for 10 times with the time interval of 2 seconds use sleep() method

b) Write a program that demonstrates a high-priority thread using Sleep to give lower-priority threads a chance to run.

a) Aim: Create a console application that displays current date a time for 10 times with the time interval of 2 seconds use sleep() method

Program

```
using System;
using System.Threading;
public class MyThread
{
   public void Thread1()
   {
      for (int i = 0; i < 10; i++)
      {
         Console.WriteLine(i);
         Thread.Sleep(200);
      }
   }
}
public class ThreadExample
{
   public static void Main()
   {
      MyThread mt = new MyThread();
      Thread t1 = new Thread(new ThreadStart(mt.Thread1));
      Thread t2 = new Thread(new ThreadStart(mt.Thread1));
      t1.Start();
      t2.Start();
   }
}
```

Output

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b) Aim:Implement a program that demonstrates a high-priority thread using Sleep to give lower-priority threads a chance to run.

Program

```
using System;
using System.Threading;

class GFG {

   // Main Method
   static public void Main()
   {

      // Creating and initializing threads
      Thread T1 = new Thread(work);
      Thread T2 = new Thread(work);
      Thread T3 = new Thread(work);

      // Set the priority of threads
      T2.Priority = ThreadPriority.Highest;
      T3.Priority = ThreadPriority.BelowNormal;
      T1.Start();
      T2.Start();
      T3.Start();

      // Display the priority of threads
      Console.WriteLine("The priority of T1 is: {0}",
                              T1.Priority);

      Console.WriteLine("The priority of T2 is: {0}",
                              T2.Priority);

      Console.WriteLine("The priority of T3 is: {0}",
                              T3.Priority);
   }

   public static void work()
   {

      // Sleep for 1 second
      Thread.Sleep(1000);
   }
}
```

Output

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WEEK 9 **DATE:**

a) create a console application to implement delegate.Create a delegate called strMyDel that takes one string parameter and returns a string.create a class named TestDelegate that contains two non-static methods space() and reverse() having following signature:String Space(String str); space between input characters String Reverse(String str); - reverse the given string

b) Create a console application to get two integer numbers from user and perform addition and multiplication on the input numbers. use the concept of MultiCastEvent

a) **Aim**: Implement a console application to implement delegate.Create a delegate called strMyDel that takes one string parameter and returns a string. reverse the given string.

Program

```
using System;
public class Exercise4
{
   public static void Main()
      {
         string str;
         int l=0;

    Console.Write("\n\nprint individual characters of string in reverse order :\n");
    Console.Write("-----------------------------------------------------\n");
    Console.Write("Input the string : ");
    str = Console.ReadLine();

    l = str.Length - 1;
                Console.Write("The characters of the string in reverse are : \n");
         while (l >= 0)
         {
            Console.Write("{0} ", str[l]);
            l--;
         }
            Console.Write("\n\n");
      }
```

```
}
```

Output

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b) **Aim**: Implement a console application to get two integer numbers from user and perform addition and multiplication on the input numbers.use the concept of MultiCastEvent

Program

```
using System;
delegate void dele(int a, int b);
public class Oper
{
    public static void Add(int a, int b)
    {
        Console.WriteLine("{0} + {1} = {2}", a, b, a + b);
    }

   public static void Sub(int a, int b)
    {
        Console.WriteLine("{0} - {1} = {2}", a, b, a - b);
    }
}
public class program
{
    static void Main()
    {
        dele del = new dele(Oper.Add);
        del += new dele(Oper.Sub);
        del(4, 2);
        del -= new dele(Oper.Sub);
        del(1, 9);

        Console.Read();
    }
}
```

Output

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C# Program to Display Results using Delegates

```
using System;
public class example
{
   public delegate int DelegateHandler(int a, int b);
   static void Main(string[] args)
   {
      Results Results = new Results();
      DelegateHandler sum = new DelegateHandler(Results.sum);
      int result = sum(50, 20);
      Console.WriteLine("Result is: " + result);
      Console.ReadLine();
   }
}

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

Output

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WEEK 10 **DATE:**

a) Create a console application to deploy on global assemble cache(using gacutil)

b) Create a bank namespace with various classes (Saving , Current) and implement the namespace in another application

a) Aim: This is a common task for developers, to add an assembly to the Global Assembly Cache (GAC). The GAC is a shared location of computer where we can put an assembly so that it will be accessible from many locations,

Program1:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
namespace ClassLibrary
{
   public class myClass
   {
      public string myFunction(string name)
      {
         return "Hello : " + name;
      }
   }
}
```

Output

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Program2:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using ClassLibrary;
namespace ConsoleAPP
{
   class Program
   {
```

```
    static void Main(string[] args)
    {
        myClass obj = new myClass();
  Console.WriteLine(obj.myFunction("Sourav"));
        Console.ReadLine();
    }
}
```

Output

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b) **Aim**: Implement a bank namespace with various classes (Saving , Current) and implement the namespace in another application

Program

```
using System;
namespace first_space {
  class namespace_cl {
    public void func() {
      Console.WriteLine("Inside first_space");
    }
  }
}
namespace second_space {
  class namespace_cl {
    public void func() {
      Console.WriteLine("Inside second_space");
    }
  }
}
class TestClass {
  static void Main(string[] args) {
    first_space.namespace_cl fc = new first_space.namespace_cl();
    second_space.namespace_cl sc = new second_space.namespace_cl();
    fc.func();
    sc.func();
    Console.ReadKey();
  }
}
```

Output

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WEEK 11 **DATE:**

Create a program to ask the user for data about books (title, author, gender and summary) and store them in a SQLSERVER database

Write a program to update books details using sql procedures

Program

```
using System;
using System.Data;
using System.Data.SqlClient;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace SqlTest_CSharp
{
   class Program
   {
      static void Main(string[] args)
      {
       using (SqlConnection conn = new SqlConnection())
          {
            conn.ConnectionString =
"Server=[server_name];Database=[database_name];Trusted_Connection=true";
             conn.Open();

             SqlCommand command = new SqlCommand("SELECT * FROM TableName
WHERE FirstColumn = @0", conn);

             command.Parameters.Add(new SqlParameter("0", 1));
             using (SqlDataReader reader = command.ExecuteReader())
             {
                Console.WriteLine("FirstColumn\tSecond Column\t\tThird Column\t\tForth
Column\t");
                while (reader.Read())
                {
                   Console.WriteLine(String.Format("{0} \t | {1} \t | {2} \t | {3}",
```

```
                    reader[0], reader[1], reader[2], reader[3]));
                }
            }
            Console.WriteLine("Data displayed! Now press enter to move to the next
section!");
            Console.ReadLine();
            Console.Clear();
            Console.WriteLine("INSERT INTO command");
            SqlCommand insertCommand = new SqlCommand("INSERT INTO TableName
(FirstColumn, SecondColumn, ThirdColumn, ForthColumn) VALUES (@0, @1, @2, @3)",
conn);
            insertCommand.Parameters.Add(new SqlParameter("0", 10));
            insertCommand.Parameters.Add(new SqlParameter("1", "Test Column"));
            insertCommand.Parameters.Add(new SqlParameter("2", DateTime.Now));
            insertCommand.Parameters.Add(new SqlParameter("3", false));

            Console.WriteLine("Commands executed! Total rows affected are " +
insertCommand.ExecuteNonQuery());
            Console.WriteLine("Done! Press enter to move to the next step");
            Console.ReadLine();
            Console.Clear();
           Console.WriteLine("Now the error trial!");

           try
            {

              SqlCommand errorCommand = new SqlCommand("SELECT * FROM
someErrorColumn", conn);

               errorCommand.ExecuteNonQuery();
            }

           catch (SqlException er)
            {
              Console.WriteLine("There was an error reported by SQL Server, " +
er.Message);
            }
         }
         Console.ReadLine();
      }
   }
}
```

Output

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WEEK 12 **DATE:**

CASE STUDY 1

a) Write a program to create a room class, the attributes of this class is roomno, roomtype, roomarea and ACmachine. In this class the member functions are setdata and displaydata

Aim:

Program

Output

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b) Write a program to create a class named shape. In this class we have three sub classes circle, triangle and square each class has two member function named draw () and erase (). Create these using polymorphism concepts

Aim:

Program

Output

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CASE STUDY 2 **DATE:**

a) Write a program to create interface named test. In this interface the member function is square. Implement this interface in arithmetic class.Create one new class called ToTestInt in this class use the object of arithmetic class.

Aim:

Program

Output

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b) Create an outer class with a function display, again create another class inside the outer class named inner with a function called display and call the two functions in the main class.

Aim:

Program

Output

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CASE STUDY 3 **DATE:**

1. Create a program to display the data about all books

Aim:

Program

Output

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2. Create a program to display the details about a given book.

Aim:

Program

Output

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VIVA QUESTIONS & ANSWERS

UNIT-1

1. How is c# better than java?

C# is a new language developed exclusively to suit the features of .NET platform. It can be Used for a variety of application that are supported by .NET platform:

Console application
Windows application
Developing windows controls
Developing ASP.NET projects
Creating web controls
Providing web services
Developing .NET component library

2.What are the differences between the c# and c++?

* C# complies straight from source code to executable code, with no object files.
* In c++, class definition does not use a semicolon at the end
* C# does not support #include statement
* In c#, switch can also be used on string values.

3. What are the differences between the c# and java?

Although c# uses .net run time that is similar to java runtime the c# complier produces an Executable code. C# has more primitive data types.Unlike java, all c# data types are objects. Arrays are declared differently in c++

4. State some of the new features that are unique to c# language?

It is a brand new language derived from the c/c++ family.
It simplifies and modernizes c++
It is the only component oriented language available today
It is a concise, lean and modern language It has a lean and consistent syntax.

5. What is .net?

.net is the software framework that includes everything required for developing software for web services.

6. What is managed code?

The code that satisfies the CLR at runtime in order to execute is referred to as managed code. For example c# complier generates II, code(managed code).

7. What is the importance of the main method in a c# program?

C# includes a feature that enables us to define more than one class with the main method. Since main is the entry point for program execution there are now than one entry points. In facts there should be only one.

This problem can be resolved by specifying which main is to be used to the complier at the time of compilation as shown below

Csc filename.cs/main: classname

8. What is a local variable?

Variable declared inside methods are called local variables. Local variable can also be declared inside program blocks that are defined between an opening brace {and the closing brace}. The scope of a local variable starts after immediately after its identifier in the declaration and extends up to the end of the block containing the declaration.

9. What is initialization? Why is it necessary?

A variable must be given a value after it has been declared but before it is used in an expression. A simple method of giving value to a variable is through the assignment statement as follow,

Variable name=value;

10. Why do we require type conversion operation?

There is a need to convert a data of one type to another before it is used in arithmetic operations or to store a value of one type into a variable of another type .for example consider the code below :

```
byte b1 = 50;
byte b2 = 60;
byte b3 = b1 + b2;
```

UNIT-II

1.What is a constructor?

A constructor initializes an object when it is created. It has the same name as its class and is syntactically similar to a method. However, constructor have no explicit return type. The general form of constructor if shown here:

```
Access class-name()
{
//constructor code
}
```

2.What is a static constructor?

A static constructor is called before any object of the class is created. This is useful to do any housekeeping work that needs to be done once. it is usually used to assign initial values to static data members.

3.What are the restrictions of static methods?
That there is no access modifier on static constructors. It cannot take any. A class can have only one static constructor.
4.What is property?
Another type of class members is the property. A property combines a field with the methods that access it. if you want to create a field that is available to users of an objects, but you want to maintain control over the operations allowed on that field.

5.What is read-only property?
There are situations where we would like to decide the value of a constant member at run-time. We may also like to have different constant values for different objects of the class. To overcome these shortcomings, c# provides another modifier known as read only
6.What is an indexer?
Array indexing is performed using the []operator. An indexer allows an object to be indexed like an array. The main use of indexes is to support the creation of specified arrays that are subjects to one or more constraints.
7.What are the two form of inheritance?
The two form of inheritance classical form, containment form
8.What is hiding a method?
We can use the modifier new to tell the compiler that the derived class method "hides" the base class method.
9.What is polymorphism?
Polymorphism means 'one name, many form'. Polymorphism can be achieved in two ways. c# supports both of them
*Operation polymorphism
*Inclusion polymorphism

10.What is early binding?
The compiler is able to select and bind the appropriate method to the object for a particular call at complier time itself. this process is called early binding, or static binding ,it is also known as complier time polymorphism

UNIT-III
1.List out the different types of applications that can be created on .net?
.Net offers closely related but distinguishable suites of tools for building windows or web applications. Both are based on the premises that many application have user interfaces centered on interacting with the user through form and controls, such as buttons, list boxes, text, and so forth
2.What are the advantage in using a dataset?
Dataset is a subset of the entire database catched on your machines without a continuous connection to the database-disconnected architecture which reduce burden on the database server which may help your application scale well.
3.Define relational database?
A database is a repository of data. A relational database organizes your data into tables. Consider the north wind database provided with Microsoft SQL server and Microsoft access.

4.What are the advantages of ADO.NET?

The significant advantage to disconnecting your data architecture from your database. The biggest advantage is that your application, whether running on the web or on a local machine, will create a reduced burden on the database server which may help your application to scale well. A disconnected architecture is resource frugal.

5.What is declarative reference integrity?

Relational database use declarative reference integrity to establish constraints on the relationship among the various tables.

This helps avoid two types of mistakes.

First, you can't enter a record with an invalid customer ID

Secondly, you can't delete a customer record it that customerID is used in any order. The integrity of your data and its relationship is thus protected.

6.Define Data Adapter?

The dataset is an abstraction of relational data base.ADO.NET uses a data Adapter as a bridge between the dataset and data source, which is the underlying database.dataAdapter provides the Fill () method to retrieve data from the database and populate the dataset.

7.Define Data Reader?

The data reader provides connected, forward-only, read-only access to a Collection of tables. By executing either a SQL statement or stored procedures.datareader is a lightweight object.

8.What are the advantages of web applications?

- They can be accessed from any browser that can connect to the server.
- Update can be made at the server
- You can achieve better performance by building a desktop application

9.What is the step to create windows application?

First open visual studio and file ----->new > project.

In project window, create a new c# windows application and name it sharpwindowsform.

10.Differentiate between data reader and dataset?

The actually uses a data reader to populate itself. A data reader is lean, mean access Methods that return results as soon as they are available, rather than for the whole of the query to be populated into a dataset.

UNIT-IV

1.What are the uses of server side controls?

.NET wants you to use server side controls that can often generate unnecessary trips back to the server by default. Plus, .NET also want to make the determination as to how will acts with various browsers. While not impossible, it is make it much more cumbersome to create custom workaround for special situations. Not to mention the facts that new browsers are released in between .NET services pack updates.

2.List out the server side state management options supported by ASP.NET.

Application states Session state Profile properties Database support

3.Differentiate the postback events with nonpostback events?

Post back events are those that cause the form to be posted back to the server immediately. In contrast, many event are considered nonpostback in that the form isn't posted back it the server immediately. Instead these events are cached by the control until the next time a post back event occurs.

4.What is WSDL?

A lot of work is being done for you automatically. HTML pages describing your web services and its methods are generated and this page includes links to pages in which the methods can be tested.

5.List down the events in life cycle of a web page?

Initialize, load view state, process postback data, load, handle postback events, prerender, save state, render, dispose

6.Define the prerender event in life cycle of a web page?

This is your last chance to modify the output the output prior to rendering using the OnPreRender () method.

7.Define Client-side support?

You make use of a web service by writing client code that acts as though it were communicating directly with a local object, but in reality communicates with host server through a proxy.

8.Define server-side support?

While creating a web service requires no special programming on your part, you need only write the implementing code, add the [web method] attribute and let the server do rest.

9.What is SOAP?

SOAP is alightweight, message-based protocol built on XML, HTTP and SMTP. Two other protocols are desiradle, but not required. For a client to a use a SOAP-enabled web service.

10.Define web form life cycle?

The life cycle begins with request for the page, which cause the server to load it. When the request is complete, the page is unloading.

UNIT V

1.What are assemblies?

An assembly is an collection of file that appear to be a single dill or executable(exe) Assemblies are .NET unit of reuse, versioning, security and deployment.

2.What is the difference between single call and singleton?

With a well-known singleton object, all messages for the object, from all clients, are dispatched to a single objet running on the server.

With a well-known single-call object, each new message from a client is handling by a new objects.

3.Define metadata?

Assemblies are the .NET unit of reuse, versioning, security, and deployment.

In addition to the objects code for the application, assemblies contain resources.

4.What is PF files.

On disk, assemblies are portable executable files, PF files are not new. The format of a.NET PE file is exactly the same as a normal windows PE files. PE files are implemented as DLLS or EXEs.it consist of one or more modules.

5.Define mulimodule assemplies

A multimodule assembly consist of multiple files . The assembly manifest in this case can reside in a standalone file, or it can be embedded in one of the modules. when the

assembly is referred the runtime loads the file containing the manifest and then loads the required modules as needed.

6.Define shared assemblies

If you want to share your assembly, it must meet certain stringent requirement Your assembly must have a strong name. strong name are globally unique.

To share your assembly place it in the global assembly cach .this is an area of the file system set aside by the CLR to hold shared assemblies.

7.Define private assemblies

Assemblies come in two flavor:

Private and shared. Private assemblies are intended to be used by only one application. Shared assemblies are intended to be shared among many applications.

8.Define attributes

Attributes are a mechanism for adding metadata ,such as compiler instructions and other data about your data , method, and classes to the program itself. Attributes are inserted into the metadata and are visible through ILDasam and other metadata-reading tools.

9.Define reflection

Reflection is the process by which a program can read its own metadata or metadata from another program. A program is said to reflect on itself or on another program, extracting metadata from the reflected assembly and using that metadata either to inform the user or to modify the program's behavior.

10.Define :Marshaling

The process of moving an object to be remoted is called marshaling.

THANKS