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**Department of Computer Science and Design**

1. Install VS code
2. Open view->Extension->C# development kit



3. Install .Net sdk:  
<https://dotnet.microsoft.com/en-us/download/dotnet/thank-you/sdk-8.0.100-windows-x64-installer>
4. To create project type following command in terminal  
**dotnet new console -o "firstapp"**

5. You can check app and default Program.cs file edit file for first program
6. On terminal type

dotnet run

**Program 1:**

Create a program that takes user input for two numbers and performs basic arithmetic operations (addition, subtraction, multiplication, and division). This program demonstrates the use of primitive data types, expressions, and control structures.

```
using System;
class HelloWorld
{
    static void Main()
    {
        int caseSwitch ;
        char ch='y';
        while(ch=='y')
        {
            Console.WriteLine("\nSelect case 1 to 4 for");

            caseSwitch =Convert.ToInt32(Console.ReadLine());
```



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```
int num1,num2,num3;
Console.WriteLine("Enter two numbers");
num1=Convert.ToInt32(Console.ReadLine());
num2=Convert.ToInt32(Console.ReadLine());
num3=0;
switch (caseSwitch)
{
case 1:
    num3=num1+num2;
    break;
case 2:
    num3=num1-num2;
    break;
case 3:
    num3=num1*num2;
    break;
case 4 :
    num3=num1/num2;
    break;
default:
    Console.WriteLine("Value didn't match earlier.");
    break;
}
String res=String.Format("Result of {0} and {1} are {2}",num1,num2,num3);
Console.WriteLine(res);
Console.WriteLine("Do u want continue");
ch= Console.ReadKey().KeyChar;
}
}
}
```

//explanation

- using System means that we can use classes from the **System namespace**.
- **namespace** is used to organize your code, and it is a container for classes and other namespaces.
- **Console** is a class of the **System namespace**, which has a **WriteLine()** method that is used to output/print text.
  - Note: when we create console application new version automatically refer builtin System so no need to add but older version need this namespace

Part B: WAP to demonstrate sum of N numbers using Arrays.



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```
using System;

class Program
{
    static void Main(string[] args)
    {
        // Prompt the user to enter the size of the array
        Console.Write("Enter the number of elements: ");
        int n = Convert.ToInt32(Console.ReadLine());

        // Declare an array of size 'n'
        int[] numbers = new int[n];

        // Input elements into the array
        Console.WriteLine("Enter the numbers:");
        for (int i = 0; i < n; i++)
        {
            numbers[i] = Convert.ToInt32(Console.ReadLine());
        }

        // Calculate the sum of the array elements
        int sum = 0;
        for (int i = 0; i < n; i++)
        {
            sum += numbers[i];
        }

        // Display the sum of the numbers
        Console.WriteLine("The sum of the entered numbers is: " + sum);

        Console.ReadLine();
    }
}
```



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#### Program 2:

Write a c# program to implement Inventory system in Game using List Data structure.

```
using System;  
using System.Collections.Generic;
```

```
class Inventory  
{  
    static void Main()  
    {  
        string name;  
        List<string> item = new List<string>();  
        string values;  
        Console.WriteLine("Enter Your Name");  
        name = Console.ReadLine();  
        Console.WriteLine("Enter number of items you want to add in list");  
        int n = Convert.ToInt32(Console.ReadLine());  
  
        for(int i=0; i<n; i++)  
        {  
            Console.WriteLine("Enter item name");  
            values = Console.ReadLine();  
            item.Add(values);  
        }  
        Console.WriteLine("Item in Inventory are:");  
        string str;  
        for(int i=0; i<item.Count; i++)  
        {  
            str = String.Format("{0}-{1} | ", i, item[i]);  
            Console.Write(str);  
        }  
        char ch = 'y';
```



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```
int pos;
Console.WriteLine("\nEnter more item in position\n");
while(ch=='y')
{
    Console.WriteLine("Enter position");
    pos=Convert.ToInt32(Console.ReadLine());
    Console.WriteLine("Enter Item");
    values=Console.ReadLine();
    item.Insert(pos,values);
    Console.WriteLine("Do u want continue Adding y/n");
    ch= Console.ReadKey().KeyChar;

}
Console.WriteLine("Item in Inventory are:");
for(int i=0;i<item.Count;i++)
{
    str=String.Format("{0}-{1} | ",i,item[i]);
    Console.Write(str);
}
Console.WriteLine("Do u want Delete item y/n");
ch= Console.ReadKey().KeyChar;

if(ch=='y')
{
    Console.WriteLine("Enter item name to remove");
    values=Console.ReadLine();
    item.Remove(values);
}
Console.WriteLine("{0} Your Final Inventory list",name);
foreach(string val in item)
{
    Console.Write(String.Format("{0}|",val));
}
}
```

**Program 3: Create a program that demonstrates the use of a dictionary to store and retrieve key-value pairs**

A Dictionary<TKey, TValue> is a generic collection that consists of elements as



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key/value pairs that are not sorted in an order

Syntax:

```
Dictionary<int, string> country = new Dictionary<int, string>();
```

Here, country is a dictionary that contains int type keys and string type value

//Program

```
using System;
```

```
using System.Collections.Generic;
```

```
class Program
```

```
{
```

```
    public static void Main()
```

```
    {
```

```
        Dictionary<int, string> country = new Dictionary<int, string>();
```

```
        Console.WriteLine("Enter number of items you want to add in Dictionary");
```

```
        int n = Convert.ToInt32(Console.ReadLine());
```

```
        int countryCode;
```

```
        string countryName;
```

```
        for (int i = 0; i < n; i++)
```

```
        {
```

```
            Console.WriteLine("Enter Country Code");
```

```
            countryCode = Convert.ToInt32(Console.ReadLine());
```

```
            Console.WriteLine("Enter Country Name");
```

```
            countryName = Console.ReadLine();
```

```
            country.Add(countryCode, countryName);
```

```
        }
```

```
        Console.WriteLine("Dictionary Data is:");
```

```
        foreach (KeyValuePair<int, string> entry in country)
```



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```
{
    Console.WriteLine(entry.Key + " : " + entry.Value);
}

Console.WriteLine("Enter key to find the value");
int key = Convert.ToInt32(Console.ReadLine());
Console.WriteLine("Value having key {0} is {1}", key,
country[key]);

// Update Dictionary Data
Console.WriteLine("Enter the key to Edit Value");
int updateKey = Convert.ToInt32(Console.ReadLine());
if (country.ContainsKey(updateKey))
{
    Console.WriteLine("Enter new value for the key {0}:",
updateKey);
    country[updateKey] = Console.ReadLine();
}
else
{
    Console.WriteLine("Key not found.");
}

Console.WriteLine("Updated Dictionary Data:");
foreach (KeyValuePair<int, string> entry in country)
{
    Console.WriteLine(entry.Key + " : " + entry.Value);
}

// Remove Value
Console.WriteLine("Enter the key of the Value you want to
remove:");
int removeKey = Convert.ToInt32(Console.ReadLine());
```



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```
        if (country.ContainsKey(removeKey))
        {
            country.Remove(removeKey);
        }
        else
        {
            Console.WriteLine("Key not found.");
        }

        Console.WriteLine("Final Dictionary Data:");
        foreach (KeyValuePair<int, string> entry in country)
        {
            Console.WriteLine(entry.Key + " : " + entry.Value);
        }
    }
}
```

**Program 4:WAP to Demonstrate Overriding function using Single inheritance to display student details.**

**//Program**

**Program5:Write a C# programs to demonstrate the concepts of Label, Text Box and Button controls. using VScode**

**Sol:**

1. Open cmd





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2. Create project
3. Install package using  
dotnet add package System.Windows.Forms
4. Open folder in vs code and edit code in .projs file to create windows app

```
<Project Sdk="Microsoft.NET.Sdk.WindowsDesktop">

  <PropertyGroup>
    <OutputType>WinExe</OutputType>
    <TargetFramework>net6.0-windows</TargetFramework>
    <UseWindowsForms>true</UseWindowsForms>
  </PropertyGroup>

</Project>
```

5. Open Program.cs and type program

```
using System;
using System.Windows.Forms;

namespace WindowsFormsApp
{
    public class MainForm : Form
    {
        // Declare controls
        private Label label;
        private TextBox textBox;
        private Button button;

        public MainForm()
        {
            // Initialize the controls
```



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```
label = new Label();
textBox = new TextBox();
button = new Button();

// Set the properties of the Label
label.Text = "Enter your name:";
label.Location = new System.Drawing.Point(20, 20);
label.AutoSize = true;

// Set the properties of the TextBox
textBox.Location = new System.Drawing.Point(20, 50);
textBox.Width = 200;

// Set the properties of the Button
button.Text = "Submit";
button.Location = new System.Drawing.Point(20, 80);
button.Click += new EventHandler(Button_Click);

// Add controls to the form
Controls.Add(label);
Controls.Add(textBox);
Controls.Add(button);

// Set the properties of the Form
this.Text = "Label, TextBox, and Button Example";
this.StartPosition = FormStartPosition.CenterScreen;
this.Size = new System.Drawing.Size(300, 200);
}

// Event handler for the button click event
private void Button_Click(object sender, EventArgs e)
{
    // Display the text from the TextBox in the Label
```

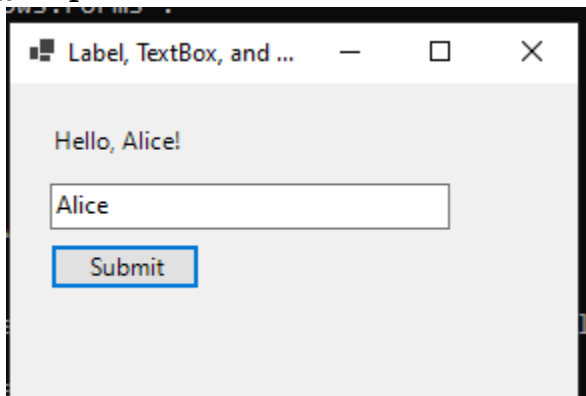


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```
        label.Text = $"Hello, {textBox.Text}!";  
    }  
  
    [STAThread]  
    static void Main()  
    {  
        // Run the application  
        Application.EnableVisualStyles();  
        Application.Run(new MainForm());  
    }  
}
```

## 6. Dotnet run

//output:



### Program 6:

A. Create a 2D Game environment with an orthographic camera .

Sol:

Step 1: Add assets from unity asset store or photoshop file

Step 2: design environment using tilemap



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Step 3: Add required colliders and assets in environment

Step 4: create player

**B. Add cinemachine and give Player movement Left and Right**

**//Add cinemachine**

Step 1: Add cinemachine as package

Step2: Select gameobject->cinemachine and add 2D camera

Step 3: Add player at lookAt and Follow

**//Add movement**

Step 1: create c# scripts

Step 2: Add script to the player

Step 3: Write code to move player

```
using UnityEditor;
using UnityEngine;

public class PlayerMovement : MonoBehaviour
{
    Rigidbody2D rb;
    public float speed=10.0f;
    public float jumpHeight=20f;
    void Start()
    {
        rb=GetComponent<Rigidbody2D>();
        Debug.Log("Strart");
    }

    // Update is called once per frame
    void Update()
    {
        float x=Input.GetAxisRaw("Horizontal");
        if(x>0)
```



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```
{  
    rb.velocity=new Vector2(speed*Time.deltaTime,rb.velocity.y);  
}  
else if(x<0)  
{  
    rb.velocity=new Vector2(-speed*Time.deltaTime,rb.velocity.y);  
}  
else  
{  
    if(Input.GetKeyDown(KeyCode.Space))  
    {  
        rb.velocity=new Vector2(rb.velocity.x,jumpHeight);  
    }  
}  
}
```

**Program 7 : Create score for player when user collects coins here two separate classes need to be created.**

Steps:

Step 1: Create new script Gamemanager.cs

Step2: create new script collector.cs

Step 3: Add coin and animate it

Step 4: Drag and drop coin in game environment

Step 5: Code Gamemanager.cs



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```
using UnityEngine;
public class Gamemanager : MonoBehaviour
{
    int score=0;

    public void AddCoin(int val)
    {
        score=score+val;
        Debug.Log(score);
    }
}
```

Step 5: code for coin script when player touches it it will Destroy

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class coin : MonoBehaviour
{
    Gamemanager gm;
    int score=10;
    void Start()
    {
        gm=FindObjectOfType<Gamemanager>();
    }
    void OnTriggerEnter2D(Collider2D other)
    {
        if(other.tag=="Player")
        {

```



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```
        gm.AddCoin(score);  
        Destroy(gameObject);  
  
    }  
}  
}
```

Program 8: Save score in File and load it as old score

Aim: Apply File Handling in Game

Step1: Edit Gamemanager class

Step2: Import System.IO

```
using System.Collections;  
using System.Collections.Generic;  
using UnityEngine;  
using System.IO;  
public class GameManager : MonoBehaviour  
{  
    // Start is called before the first frame update  
    int score=0;  
    int old_score=0;  
  
    SaveDataval obj = new SaveDataval();  
    string json;  
    void Start()  
    {  
        LoadData();  
    }  
    public void AddCoin(int value)  
    {
```



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```
        score=score+value;
        Debug.Log($"New score: {score}");
        SaveGameData();
    }
    void SaveGameData()
    {
        obj.score = score;
        //to create Json
        json = JsonUtility.ToJson(obj);
        Debug.Log(json); //to display json in log
        File.WriteAllText(Application.dataPath + "MyJsonFile.json",
json);
        Debug.Log(Application.dataPath.ToString());
    }
    void LoadData()
    {
        string json =
File.ReadAllText(Application.dataPath+"MyJsonFile.json");
        obj = JsonUtility.FromJson<SaveDataval>(json);
        old_score = obj.score;
        Debug.Log($"Old score: {old_score}");
    }

    class SaveDataval
    {
        public int score;
    }
}
```





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**Program 9:**

**Aim: Apply UX/UX in Game**

**A. Add UI and show score in UI.**

Step 1: Right click in Hierarchy window->UI->TextMesh Pro

Step 2: Click import

Step 3: Set textbox

Step 4: Edit Gamemanager script

Step5: Attach UI to Gamemanager

```
using UnityEngine;
using TMPro;
public class Gamemanager : MonoBehaviour
{
    public TextMeshProUGUI txt;
    int score=0;
    // Start is called before the first frame update
    void Start()
    {
        txt.text=score.ToString();
    }
    public void AddCoin(int val)
    {
        score=score+val;
        Debug.Log(score);
        txt.text=score.ToString();
    }
}
```

**B. Create Button UI and call different methods on the button.**



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Step 1: Add Panel by Rightclick->UI

Step 2: Add two ButtonMesh Pro and set it in Game

Step 3: Name button as Quit and Restart

Step 4 : Edit Gamemanager script to display UI and handle button

```
using UnityEngine;
using TMPro;
using UnityEngine.SceneManagement;
public class Gamemanager : MonoBehaviour
{
    //code for score
    public TextMeshProUGUI txt;
    int score=0;
    // Start is called before the first frame update
    void Start()
    {
        txt.text=score.ToString();
    }
    public void AddCoin(int val)
    {
        score=score+val;
        Debug.Log(score);
        txt.text=score.ToString();
    }
    //Code for button
    public void Restart()
    {
        SceneManager.LoadScene(0);
    }
    public void Quit()
    {

```



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```
Application.Quit();  
}  
}
```