

Lab Assignment 4 in C#

Q 1. Create a class BankAccount with a property Balance.

The property should allow deposit but not allow direct withdrawal (only decrease balance via a method).

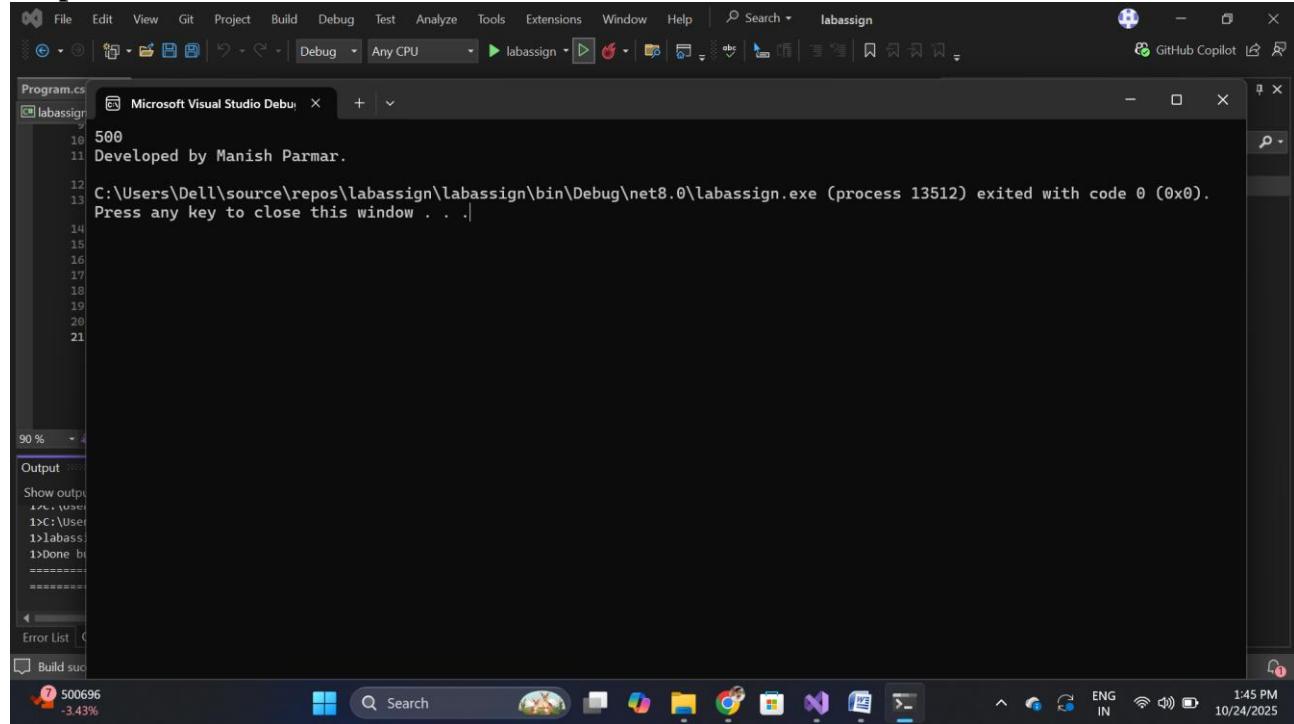
Demonstrate depositing 1000 and withdrawing 500 using the property and method.

Ans 1. `using System;`

```
class LabAssignment5
{
    public decimal Balance { get; private set; }
    public void Deposit(decimal amount) { Balance += amount; }
    public void Withdraw(decimal amount) { if (amount <= Balance) Balance -= amount; }
}

class flrogram
{
    static void Main()
    {
        LabAssignment5 account = new LabAssignment5();
        account.Deposit(1000);
        account.Withdraw(500);
        Console.WriteLine(account.Balance);
        Console.WriteLine("Developed by Manish Parmar.");
    }
}
```

Output:



```
500
Developed by Manish Parmar.

C:\Users\DELL\source\repos\labasssign\labasssign\bin\Debug\net8.0\labasssign.exe (process 13512) exited with code 0 (0x0).
Press any key to close this window . . .
```

Q 2. Design a class Student with a property Age.

Ensure that only values between 5 and 25 are allowed.

If invalid age is set, default to 18.

Show the behavior for age 4, 20, and 30.

Ans 2. using System;

```
class LabAssignment5
{
    private int age;
    public int Age
    {
        get { return age; }
        set { age = (value >= 5 && value <= 25) ? value : 18; }
    }
}

class flrogram
{
    static void Main()
    {
        LabAssignment5 s1 = new LabAssignment5 { Age = 4 };
        LabAssignment5 s2 = new LabAssignment5 { Age = 20 };
        LabAssignment5 s3 = new LabAssignment5 { Age = 30 };
        Console.WriteLine(s1.Age);
        Console.WriteLine(s2.Age);
        Console.WriteLine(s3.Age);
        Console.WriteLine("Developed by Manish
Parmar.");
    }
}
```

Output:

```
Microsoft Visual Studio Debug + 
1 Invalid age 4, setting default age 18.
2 Student age is: 18
3 Student age is: 20
4 Invalid age 30, setting default age 18.
5 Student age is: 18
6
7 --- Developed by Manish Parmar ---
8
9
10
11 C:\Users\...labassign\bin\Debug\net8.0\labassign.exe (process 17484) exited with code 0 (0x0).
12 Press any key to close this window . . .
13
14
15
16
17
18
```

Output
Show output from build start
19----- Build
20 skipping all
21 labassign
22 ----- Build
23 ----- Build
24
Error List Output
Build succeeded

Q 3. Create a class Employee with:

A private field basicSalary.

A read-only property TotalSalary that calculates salary with 20% bonus.

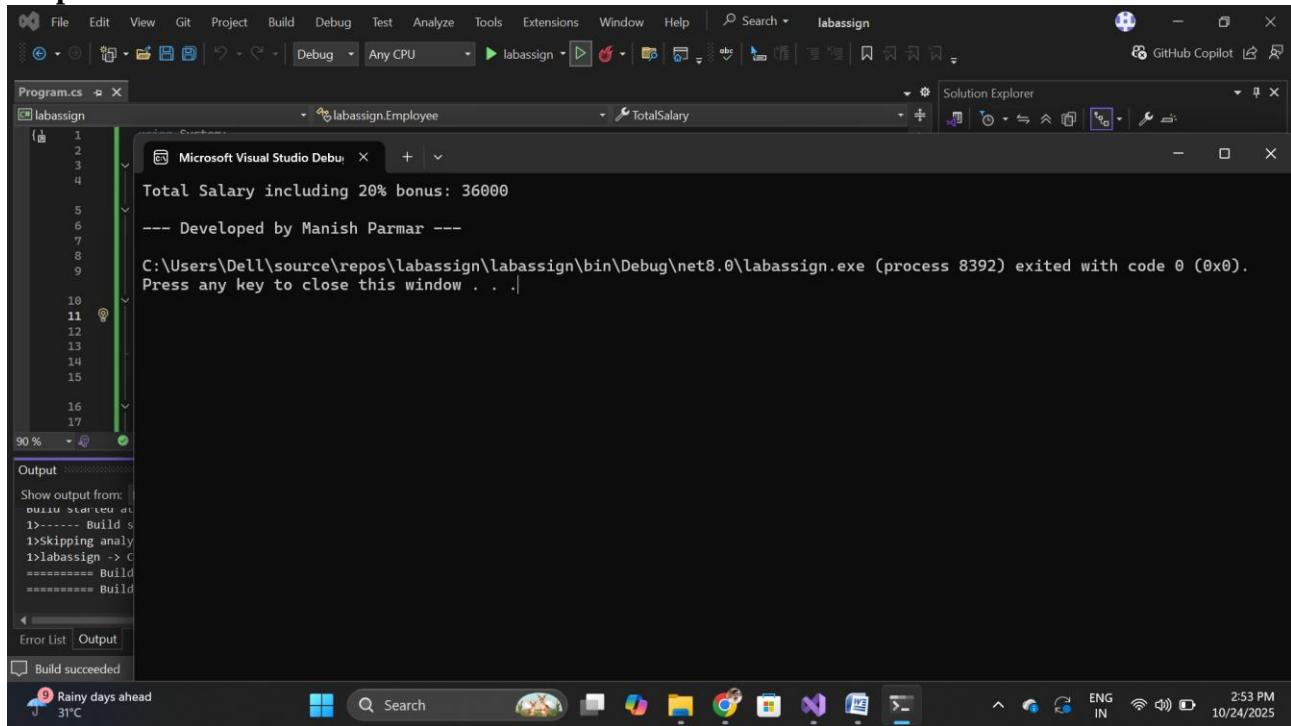
Demonstrate setting basicSalary = 30000 and display TotalSalary.

Ans 3. using System;

```
class LabAssignment5
{
    private decimal basicSalary;
    public decimal TotalSalary { get { return basicSalary + (basicSalary * 0.2m); } }
    public void SetBasicSalary(decimal salary) { basicSalary = salary; }
}

class flrogram
{
    static void Main()
    {
        LabAssignment5 emp = new LabAssignment5();
        emp.SetBasicSalary(30000);
        Console.WriteLine(emp.TotalSalary);
        Console.WriteLine("Developed by Manish Parmar.");
    }
}
```

Output:



Q 4. Build a class Product with two auto-properties: Price and Discount.
Add a method to calculate the final price = Price – (Price * Discount/100).

Show result for a product with Price = 2000 and Discount = 10%.

Ans 4. using System;

```
class LabAssignment5
{
    public decimal flrice { get; set; }
    public decimal Discount { get; set; }
    public decimal Finalflrice() { return flrice - (flrice * Discount / 100); }
}
```

```

class flrogram
{
    static void Main()
    {
        LabAssignment5 p = new LabAssignment5 { flrice = 2000, Discount = 10 };
        Console.WriteLine(p.Finalflrice());
        Console.WriteLine("Developed by Manish Parmar.");
    }
}

```

Output:

The screenshot shows the Microsoft Visual Studio interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help, and a GitHub Copilot icon. The toolbar below has icons for file operations like Open, Save, and Print, along with a search bar and a 'labassign' tab. The main workspace shows a 'Program.cs' file with the provided C# code. Below it is the 'Microsoft Visual Studio Debug' window displaying the program's output: 'Final Price after discount: 1800' and '--- Developed by Manish Parmar ---'. The bottom status bar shows system information like battery level (90%), signal strength, and the date/time (10/24/2025).

```

26
27
28
29
30
31 } Final Price after discount: 1800
32 --- Developed by Manish Parmar ---
C:\Users\Dell\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe (process 15732) exited with code 0 (0x0).
Press any key to close this window . . .

```

Q 5. Create a Car class with a property Speed.
Speed should not exceed 180 km/h; if it exceeds, reset to 180.

Write code to set speed = 150, then 200, and display the final speed.

Ans 5. using System;

```

class LabAssignment5
{
    private int speed;
    public int Speed
    {
        get { return speed; }
        set { speed = value > 180 ? 180 : value; }
    }
}

class flrogram
{
    static void Main()
    {
        LabAssignment5 car = new LabAssignment5();
        car.Speed = 150;
        car.Speed = 200;
        Console.WriteLine(car.Speed);
    }
}

```

```

        Console.WriteLine("Developed by Manish Parmar.");
    }
}

```

Output:

The screenshot shows the Microsoft Visual Studio interface with the output window open. The output window displays the following text:

```

Current Speed: 150
Speed 200 exceeds 180 km/h. Resetting to 180.
Current Speed: 180
--- Developed by Manish Parmar ---
C:\Users\Dell\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe (process 10024) exited with code 0 (0x0).
Press any key to close this window . . .

```

The status bar at the bottom of the screen shows "Build succeeded". The taskbar at the bottom right includes icons for weather (31°C, Sunny), search, file explorer, task manager, and other system applications.

Q 6. Define a delegate Operation for performing arithmetic operations.
Implement methods Add and Subtract.

Ask the user for two numbers and apply both operations using the delegate.

Ans 6. using System;

```

delegate int Operation(int a, int b);

class LabAssignment5
{
    static int Add(int a, int b) { return a + b; }
    static int Subtract(int a, int b) { return a - b; }

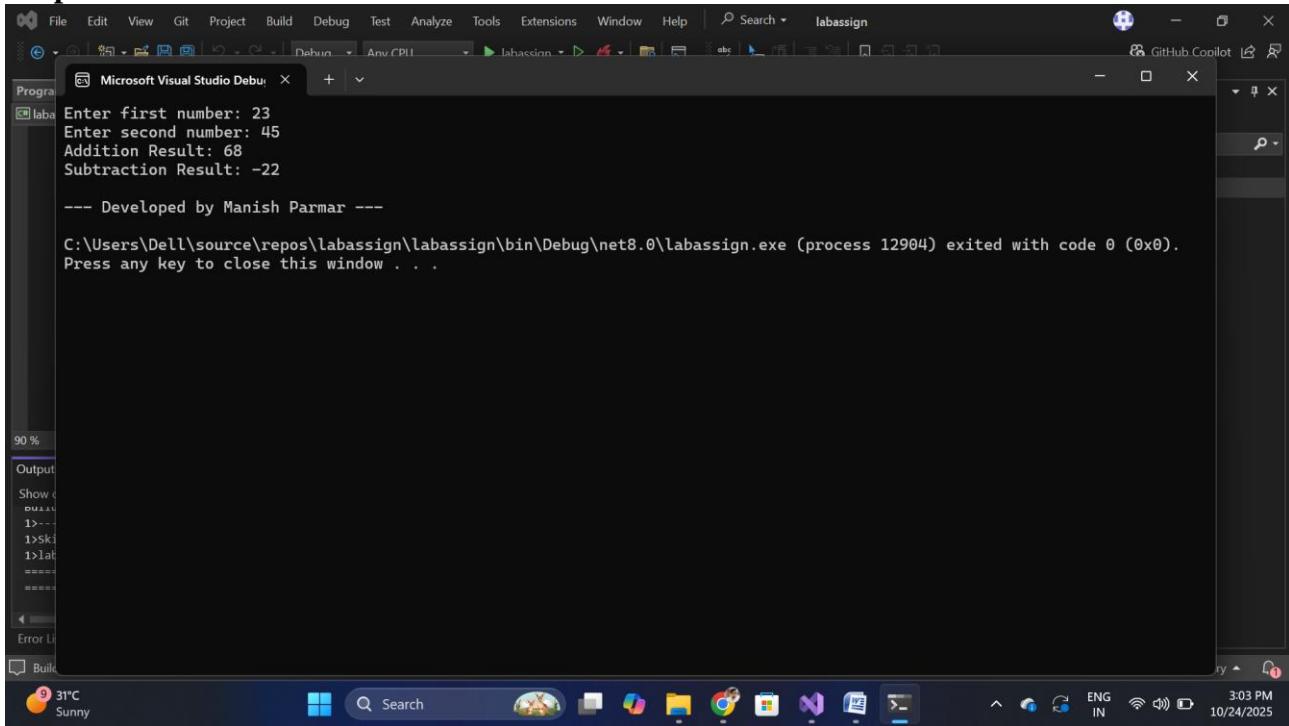
    static void Main()
    {
        Console.WriteLine("Enter first number: ");
        int x = int.Parse(Console.ReadLine());
        Console.WriteLine("Enter second number: ");
        int y = int.Parse(Console.ReadLine());

        Operation opAdd = Add;
        Operation opSub = Subtract;

        Console.WriteLine("Addition: " + opAdd(x, y));
        Console.WriteLine("Subtraction: " + opSub(x, y));
        Console.WriteLine("Developed by Manish Parmar.");
    }
}

```

Output:



The screenshot shows the Microsoft Visual Studio Debug window. The output pane displays the following text:

```
Enter first number: 23
Enter second number: 45
Addition Result: 68
Subtraction Result: -22
--- Developed by Manish Parmar ---
C:\Users\DELL\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe (process 12904) exited with code 0 (0x0).
Press any key to close this window . . .
```

The system tray at the bottom shows the date and time as 10/24/2025, 3:03 PM, and a weather icon indicating it's sunny at 31°C.

Q 7. Create a delegate Format Text that accepts a string.

Implement methods to return: The string in uppercase.

The string in lowercase.

Demonstrate calling both through the delegate on input "Hello World".

Ans 7. using System;

```
delegate string FormatText(string text);

class LabAssignment5
{
    static string ToUpperCase(string text) { return text.ToUpper(); }
    static string ToLowerCase(string text) { return text.ToLower(); }

    static void Main()
    {
        string input = "Hello World";
        FormatText upper = ToUpperCase;
        FormatText lower = ToLowerCase;
        Console.WriteLine(upper(input));
        Console.WriteLine(lower(input));
        Console.WriteLine("Developed by Manish Parmar.");
    }
}
```

Output:

```
Original Text: Hello World
Uppercase: HELLO WORLD
Lowercase: hello world
--- Developed by Manish Parmar ---
C:\Users\DELL\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe (process 2568) exited with code 0 (0x0).
Press any key to close this window . . .
11
12
13
14
15
16
17
```

Output
Show output
Build Log
1>-----
1>Skipped
1>labass
=====
Error List
Build suc

Power & Battery
Energy saver is on

Q 8. Create a delegate BillingOperation that accepts a product amount.

Implement four related methods: ShowTotal → Display original price.

ApplyDiscount → Apply 10% discount.

AddTax → Add 18% GST on discounted price.

FinalBill → Display final payable amount.

Use delegate chaining to call these methods step by step for an item worth ₹5000.

Ans 8. using System;

```
delegate void BillingOperation(decimal amount);

class LabAssignment5
{
    private decimal current;
    public void ShowTotal(decimal amount)
    {
        current = amount;
        Console.WriteLine("Original flrice: ₹" + current.ToString("0.00"));
    }
    public void ApplyDiscount(decimal amount)
    {
        current = current * 0.90m;
        Console.WriteLine("After 10% discount: ₹" + current.ToString("0.00"));
    }
    public void AddTax(decimal amount)
    {
        current = current + current * 0.18m;
        Console.WriteLine("After 18% GST: ₹" + current.ToString("0.00"));
    }
    public void FinalBill(decimal amount)
    {
        Console.WriteLine("Final flayable: ₹" + current.ToString("0.00"));
    }
}

class flrogram
{
    static void Main()
    {
        LabAssignment5 bill = new LabAssignment5();
        BillingOperation ops = bill.ShowTotal;
        ops += bill.ApplyDiscount;
        ops += bill.AddTax;
        ops += bill.FinalBill;
        ops(5000m);
        Console.WriteLine("Developed by Manish Parmar.");
    }
}
```

Output:

```
Original Price: ?5000
After 10% Discount: ?4500
After 18% GST: ?5310
Final Payable Amount: ?5310

--- Developed by Manish Parmar ---

C:\Users\Dell\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe (process 16160) exited with code 0 (0x0).
Press any key to close this window . . .
```

Output

```
Show output from
Build Start
1>----- Build: 1 succeeded, 0 failed, 0 skipped -----
1>skipping all files for project as solution file was up-to-date.
1>labassign
===== Build: 1 succeeded, 0 failed, 0 skipped =====
```

Error List | Output

Build succeeded

Q 9. Define a delegate ConvertTemperature that takes double input.

Implement two methods: Celsius to Fahrenheit.

Celsius to Kelvin.

Show result for 25°C.

Ans 10. `using System;`

```
delegate double ConvertTemperature(double celsius);

class LabAssignment5
{
    static double ToFahrenheit(double celsius) { return (celsius * 9 / 5) + 32; }
    static double ToKelvin(double celsius) { return celsius + 273.15; }

    static void Main()
    {
        double temp = 25;
        ConvertTemperature toF = ToFahrenheit;
        ConvertTemperature toK = ToKelvin;
        Console.WriteLine("Fahrenheit: " + toF(temp));
        Console.WriteLine("Kelvin: " + toK(temp));
        Console.WriteLine("Developed by Manish Parmar.");
    }
}
```

Output:

The screenshot shows the Microsoft Visual Studio IDE interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help, and a GitHub Copilot icon. The toolbar contains various icons for file operations like Open, Save, and Print. The main window displays the code editor with a file named Program.cs containing the following code:

```
1 // Microsoft Visual Studio Debug
2 Temperature in Celsius: 25°C
3 Converted to Fahrenheit: 77°F
4 Converted to Kelvin: 298.15K
5
6 --- Developed by Manish Parmar ---
7
8
9
10
11 C:\Users\Dell\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe (process 19028) exited with code 0 (0x0).
12 Press any key to close this window . . .
13
14
15
16
17
```

The Output window below shows build logs:

```
Show output from: labassign
1>----- Build started: Project: labassign -----
1>Skipping analysis
1>labassign -> C:\Users\Dell\source\repos\labassign\labassign\bin\Debug\net8.0\labassign.exe
1>----- Build started: Project: labassign -----
1>----- Build succeeded -----
```

The status bar at the bottom indicates the system is 31°C and sunny, the date is 10/24/2025, and the time is 3:09 PM.