

LAB-5

Q1)1,2,3 TASKS

2100032064

```
using System;
```

```
public abstract class Deposit
```

```
{
```

```
    public decimal Amount { get; }
```

```
    public int Period { get; }
```

```
    public Deposit(decimal depositAmount, int depositPeriod)
```

```
    {
```

```
        Amount = depositAmount;
```

```
        Period = depositPeriod;
```

```
    }
```

```
    public abstract decimal Income();
```

```
}
```

```
public class BaseDeposit : Deposit
```

```
{
```

```
    public BaseDeposit(decimal amount, int period) : base(amount, period)
```

```
    {
```

```
    }
```

```
    public override decimal Income()
```

```
    {
```

```
        decimal currentAmount = Amount;
```

```
        decimal income = 0;
```

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

```
        {
```

```

        decimal monthlyInterest = currentAmount * 0.05m;

        income += monthlyInterest;

        currentAmount += monthlyInterest;
    }

    return Math.Round(income, 2);
}

public class SpecialDeposit : Deposit
{
    public SpecialDeposit(decimal amount, int period) : base(amount, period)
    {
    }

    public override decimal Income()
    {
        decimal currentAmount = Amount;
        decimal income = 0;

        for (int i = 0; i < Period; i++)
        {
            decimal monthlyInterest = currentAmount * (i + 1) / 100m;

            income += monthlyInterest;

            currentAmount += monthlyInterest;
        }

        return Math.Round(income, 2);
    }
}

public class LongDeposit : Deposit
{

```

```

public LongDeposit(decimal amount, int period) : base(amount, period)
{
}

public override decimal Income()
{
    decimal income = 0;

    for (int i = 0; i < Period; i++)
    {
        if (i >= 6)
        {
            decimal monthlyInterest = Amount * 0.15m;
            income += monthlyInterest;
            Amount += monthlyInterest;
        }
    }

    return Math.Round(income, 2);
}
}

```

```

public class Client
{
    private Deposit[] deposits;

    public Client()
    {
        deposits = new Deposit[10];
    }

    public bool AddDeposit(Deposit deposit)
    {

```

```
for (int i = 0; i < deposits.Length; i++)  
{  
    if (deposits[i] == null)  
    {  
        deposits[i] = deposit;  
        return true;  
    }  
}  
return false;  
}
```

```
public decimal TotalIncome()  
{  
    decimal totalIncome = 0;  
    foreach (var deposit in deposits)  
    {  
        if (deposit != null)  
        {  
            totalIncome += deposit.Income();  
        }  
    }  
    return Math.Round(totalIncome, 2);  
}
```

```
public decimal MaxIncome()  
{  
    decimal maxIncome = 0;  
    foreach (var deposit in deposits)  
    {  
        if (deposit != null)  
        {  
            decimal income = deposit.Income();  
            if (income > maxIncome)
```

```

        {
            maxIncome = income;
        }
    }
}

return Math.Round(maxIncome, 2);
}

```

```

public decimal GetIncomeByNumber(int number)
{
    if (number > 0 && number <= deposits.Length && deposits[number - 1] != null)
    {
        return Math.Round(deposits[number - 1].Income(), 2);
    }
    return 0;
}
}

```

```

class Program
{
    static void Main(string[] args)
    {
        // Testing the classes

        Client client = new Client();

        BaseDeposit baseDeposit = new BaseDeposit(1000, 3);
        SpecialDeposit specialDeposit = new SpecialDeposit(1000, 3);
        LongDeposit longDeposit = new LongDeposit(1000, 12);

        client.AddDeposit(baseDeposit);
        client.AddDeposit(specialDeposit);
        client.AddDeposit(longDeposit);
    }
}

```

```

        Console.WriteLine($"Total income: {client.TotalIncome()}");

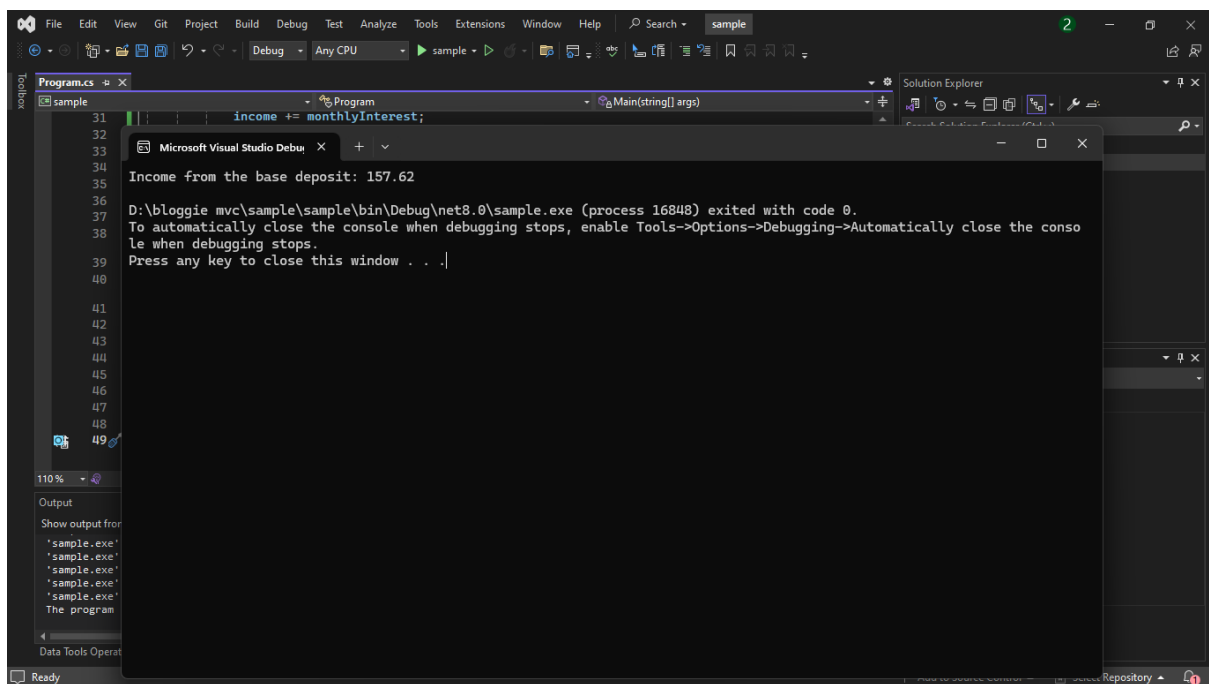
        Console.WriteLine($"Max income: {client.MaxIncome()}");

        Console.WriteLine($"Income from deposit number 2: {client.GetIncomeByNumber(2)}");

    }
}

```

Output :



Q2) TASK1,2,3

using System;

using System.Collections;

using System.Collections.Generic;

public interface Iprolongable

{

```
    bool CanToProlong();
}

public abstract class Deposit : IComparable<Deposit>
{
    public decimal Amount { get; }
    public int Period { get; }

    public Deposit(decimal depositAmount, int depositPeriod)
    {
        Amount = depositAmount;
        Period = depositPeriod;
    }

    public abstract decimal Income();

    public decimal TotalSum()
    {
        return Amount + Income();
    }

    public int CompareTo(Deposit other)
    {
        return TotalSum().CompareTo(other.TotalSum());
    }
}

public class BaseDeposit : Deposit
{

```

```

public BaseDeposit(decimal amount, int period) : base(amount, period)
{
}

public override decimal Income()
{
    decimal currentAmount = Amount;
    decimal income = 0;

    for (int i = 0; i < Period; i++)
    {
        decimal monthlyInterest = currentAmount * 0.05m;
        income += monthlyInterest;
        currentAmount += monthlyInterest;
    }

    return Math.Round(income, 2);
}
}

public class SpecialDeposit : Deposit, Iprolongable
{
    public SpecialDeposit(decimal amount, int period) : base(amount, period)
    {
    }

    public override decimal Income()
    {
        decimal currentAmount = Amount;

```



```
decimal income = 0;
```

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

```
{
```

```
    decimal monthlyInterest = currentAmount * (i + 1) / 100m;
```

```
    income += monthlyInterest;
```

```
    currentAmount += monthlyInterest;
```

```
}
```

```
return Math.Round(income, 2);
```

```
}
```

```
public bool CanToProlong()
```

```
{
```

```
    return Amount > 1000;
```

```
}
```

```
}
```

```
public class LongDeposit : Deposit, Iprolongable
```

```
{
```

```
    public LongDeposit(decimal amount, int period) : base(amount, period)
```

```
{
```

```
}
```

```
public override decimal Income()
```

```
{
```

```
    decimal income = 0;
```

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

```

{
    if (i >= 6)
    {
        decimal monthlyInterest = Amount * 0.15m;
        income += monthlyInterest;
        Amount += monthlyInterest;
    }
}

return Math.Round(income, 2);
}

public bool CanToProlong()
{
    return Period <= 36; // 3 years in months
}
}

public class Client : IEnumerable<Deposit>
{
    private Deposit[] deposits;
    private int count;

    public Client()
    {
        deposits = new Deposit[10];
        count = 0;
    }
}

```

```
public bool AddDeposit(Deposit deposit)
{
    if (count < deposits.Length)
    {
        deposits[count] = deposit;
        count++;
        return true;
    }
    return false;
}
```

```
public decimal TotalIncome()
{
    decimal totalIncome = 0;
    foreach (var deposit in deposits)
    {
        if (deposit != null)
        {
            totalIncome += deposit.Income();
        }
    }
    return Math.Round(totalIncome, 2);
}
```

```
public decimal MaxIncome()
{
    decimal maxIncome = 0;
    foreach (var deposit in deposits)
    {
```

```
    if (deposit != null)
    {
        decimal income = deposit.Income();
        if (income > maxIncome)
        {
            maxIncome = income;
        }
    }
}
return Math.Round(maxIncome, 2);
}
```

```
public decimal GetIncomeByNumber(int number)
{
    if (number > 0 && number <= count && deposits[number - 1] != null)
    {
        return Math.Round(deposits[number - 1].Income(), 2);
    }
    return 0;
}
```

```
public IEnumerable<Deposit> GetEnumerator()
{
    foreach (var deposit in deposits)
    {
        yield return deposit;
    }
}
```

```

IEnumerator IEnumerable.GetEnumerator()
{
    return GetEnumerator();
}

public void SortDeposits()
{
    Array.Sort(deposits, 0, count);
    Array.Reverse(deposits, 0, count);
}

public int CountPossibleToProlongDeposit()
{
    int countPossible = 0;
    foreach (var deposit in deposits)
    {
        if (deposit != null && deposit is Iprolongable &&
            ((Iprolongable)deposit).CanToProlong())
        {
            countPossible++;
        }
    }
    return countPossible;
}

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

```

```
Client client = new Client();
```

```
BaseDeposit baseDeposit = new BaseDeposit(1000, 3);
```

```
SpecialDeposit specialDeposit = new SpecialDeposit(1500, 3);
```

```
LongDeposit longDeposit = new LongDeposit(2000, 24);
```

```
client.AddDeposit(baseDeposit);
```

```
client.AddDeposit(specialDeposit);
```

```
client.AddDeposit(longDeposit);
```

```
Console.WriteLine($"Total income: {client.TotalIncome()}");
```

```
Console.WriteLine($"Max income: {client.MaxIncome()}");
```

```
Console.WriteLine($"Income from deposit number 2:  
{client.GetIncomeByNumber(2)}");
```

```
client.SortDeposits();
```

```
Console.WriteLine("\nDeposits after sorting:");
```

```
foreach (var deposit in client)
```

```
{
```

```
    Console.WriteLine($"Total sum amount: {deposit.TotalSum()}");
```

```
}
```

```
Console.WriteLine($"Count of possible to prolong deposits:  
{client.CountPossibleToProlongDeposit()}");
```

```
}
```

```
}
```

Output :

