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Sem – 5th

Dept – IT

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Subject – Object Oriented Programming Lab

Subject Code – PCC – CS593

Assignment1_1. Create a class with data members and at least two methods to initialize the data members and perform some operations on those data members respectively.

Code :

```
import java.util.*;
class asg11
{
   int num1,num2;
        void initialize(int a,int b)
        {
                num1=a;
                num2=b;
                System.out.println("data members initialized ");
        }
        int addition()
        {
                        System.out.println("addition method is invoked ");
                        return(num1+num2);
        }
        int multiplication()
        {
                System.out.println("multi method is invoked ");
                return(num1*num2);
        }
        int division()
        {
                System.out.println("division method is invoked ");
                if(num1>num2)
                {
                        return (num1/num2);
                }
                else
                {
                        return(num2/num1);
                }
        }
```

```
int subtraction()
{
        System.out.println("Subtraction method is invoked ");
        if(num1>num2)
        {
                return (num1-num2);
        }
        else
        {
                return(num2-num1);
        }
}
public static void main(String args[])
{
        int x;
        asg11 ob=new asg11();
        ob.initialize(30,40);
        x=ob.addition();
        System.out.println("addition result is "+x);
        x=ob. subtraction();
        System.out.println("subtraction result is "+x);
        x=ob.multiplication();
        System.out.println("multiplication result is "+x);
        x=ob.division();
        System.out.println("division result is "+x);
}}
```

Output :

Assignment1_2. Create constructor of a class and ensure that this constructor is invoked when an object of this class is created.

Code :

```
import java.util.*;
class asg12
{
   int num1,num2;
   asg12()
   {
      num1=9;
      num2=3;
      System.out.println("data member initialized with default value ");
   }
   asg12(int a,int b)
   {
      num1=a;
      num2=b;
      System.out.println("data member initialized with parameterized value ");
   }
   int addition()
   {
      System.out.println("addition method is invoked ");
      return(num1+num2);
   }
   int multiplication()
   {
      System.out.println("multi method is invoked ");
      return(num1*num2);
   }
   int subtraction()
   {
      System.out.println("Subtraction method is invoked ");
      if(num1>num2)
      {
```

```
            return (num1-num2);
        }
        else
        {
            return(num2-num1);
        }
    }
    int division()
    {
        System.out.println("division method is invoked ");
        if(num1>num2)
        {
            return (num1/num2);
        }
        else
        {
            return(num2/num1);
        }
    }

    public static void main(String ar[])
    {
        int x;
        asg12 ob=new asg12();
        asg12 ob1=new asg12(60,12);
        System.out.println("with default value ");
        x=ob.addition();
        System.out.println("result is "+x);
        x=ob. subtraction();
        System.out.println("subtraction result is "+x);
        x=ob.multiplication();
        System.out.println("multiplication result is "+x);
        x=ob.division();
        System.out.println("division result is "+x);
    }
}
```

Output :


Command Prompt
C:\Users\ankit\Desktop>javac asg12.java
C:\Users\ankit\Desktop>java asg12
data member initialized with default value
data member initialized with parameterized value
with default value
addition method is invoked
result is 12
Subtraction method is invoked
subtraction result is 6
multi method is invoked
multiplication result is 27
division method is invoked
division result is 3
C:\Users\ankit\Desktop>

Assignment1_3. Write a program with two classes where the former class is the super class of the second class and the second class inherits all the data members and the methods of the first class.

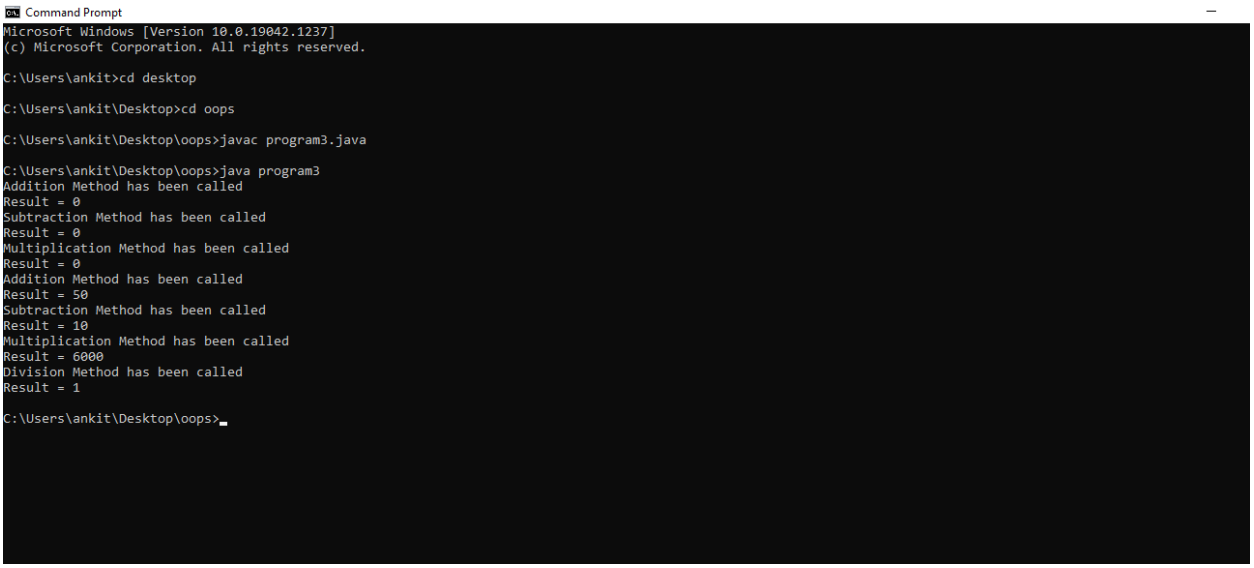
Code :

```
class first
{
	int data1,data2;
	first()
	{
		data1=0;
		data2=0;
	}
	first(int data1,int data2)
	{
		this.data1=data1;
		this.data2=data2;
	}
	int addition()
	{
		System.out.println("Addition Method has been called");
		return(data1+data2);
	}
	int subtraction()
	{
```

```
            System.out.println("Subtraction Method has been called");
            return(data1-data2);
        }
}
class second extends first
{
        int data3;
        second()
        {
            data3=0;
        }
        second(int x,int y,int z)
        {
            super(x,y);
            data3=z;
        }
        int multiplication()
        {
            System.out.println("Multiplication Method has been called");
            return(data1*data2*data3);
        }
        int division()
        {
            System.out.println("Division Method has been called");
            return(data1/data2);
        }
```

```
}
class program3
{
	public static void main(String args[])
	{
		int a;
		second ob=new second();
		a=ob.addition();
		System.out.println("Result = "+a);
		a=ob.subtraction();
		System.out.println("Result = "+a);
		a=ob.multiplication();
		System.out.println("Result = "+a);
		second ob1=new second(30,20,10);
		a=ob1.addition();
		System.out.println("Result = "+a);
		a=ob1.subtraction();
		System.out.println("Result = "+a);
		a=ob1.multiplication();
		System.out.println("Result = "+a);
		a=ob1.division();
		System.out.println("Result = "+a);
	}
}
```

Output :


Command Prompt
Microsoft Windows [Version 10.0.19042.1237]
(c) Microsoft Corporation. All rights reserved.
C:\Users\ankit>cd desktop
C:\Users\ankit\Desktop>cd oops
C:\Users\ankit\Desktop\oops>javac program3.java
C:\Users\ankit\Desktop\oops>java program3
Addition Method has been called
Result = 0
Subtraction Method has been called
Result = 0
Multiplication Method has been called
Result = 0
Addition Method has been called
Result = 50
Subtraction Method has been called
Result = 10
Multiplication Method has been called
Result = 6000
Division Method has been called
Result = 1
C:\Users\ankit\Desktop\oops>

Assignment1_4. Create methods that have the same name but different parameter lists and different definitions i.e. overloading of the default method.

Code :

```
class mthdovrldng
{
	void sum(int a)
	{
		System.out.println("Single parameter interger method");
	}
	void sum(float a)
	{
		System.out.println("Single parameter float method");
	}
	void sum(int a,float b)
	{
		System.out.println("Double parameter interger and float");
	}
	void sum(float a,int b)
	{
		System.out.println("Double parameter float and interger");
	}
	void sum(int a,int b)
	{
```

```
            System.out.println("Change parameter number : Double interger parameter");
        }
        void sum(int a,int b,int c)
        {
            System.out.println("Change parameter number : Triple interger parameter");
        }
}
class asg14
{
        public static void main(String args[])
        {
            mthdovrldng ob=new mthdovrldng();
            ob.sum(10);
            ob.sum(10.0f);
            ob.sum(10,20.f);
            ob.sum(10.0f,20);
            ob.sum(10,20);
            ob.sum(10,20,30);
        }
}
```

Output :


Command Prompt
C:\Users\ankit\Desktop>javac asg3.java
C:\Users\ankit\Desktop>java asg3
Single parameter interger method
Single parameter float method
Double parameter interger and float
Double parameter float and interger
Change parameter number : Double interger parameter
Change parameter number : Triple interger parameter
C:\Users\ankit\Desktop>

Assignment1_5. Create a super class with at least one method and a subclass that inherits all the member of the super class. Now define that method in the sub class that has the same name, same arguments and same return type as a method in the super class i.e. override the method of the super class in the subclass.

Code :

```
class parent
{
	int d1,d2;
	parent()
	{
		d1=0;d2=0;
	}
	parent(int x,int y)
	{
		d1=x;d2=y;
	}
	int cal()
	{
		System.out.println("Additon is invoked");
		return(d1+d2);
	}
	int cal(int x)
	{
```

```
                System.out.println("Subtract is invoked");
                if (d1>d2)
                        return(d1-d2);
                else
                        return(d2-d1);
        }
}
class child extends parent
{
        int d3;
        child()
        {
                d3=0;
        }
        child(int x,int y,int z)
        {
                super (x,y);
                d3=z;
        }
        int cal()
        {
                System.out.println("multiplication is invoked");
                return(d1*d2*d3);
        }
        int cal(int x)
        {
```

```
            System.out.println("Divison is invoked");
            return(d1/d2);
        }
}
class asg15
{
        public static void main(String args[])
        {
            int a;
            parent ob=new parent();
            child ob1=new child(30,20,10);
            parent ob2;
            ob2=ob;
            a=ob2.cal();
            System.out.println("Result: "+a);
            a=ob2.cal(0);
            System.out.println("Result: "+a);
            ob2=ob1;
            a=ob2.cal();
            System.out.println("Result: "+a);
            a=ob2.cal(0);
            System.out.println("Result: "+a);
        }
}
```

Output :


Command Prompt
Microsoft Windows [Version 10.0.19042.1237]
(c) Microsoft Corporation. All rights reserved.
C:\Users\ankit>cd desktop
C:\Users\ankit\Desktop>javac asg15.java
C:\Users\ankit\Desktop>java asg15
Additon is invoked
Result: 0
Subtract is invoked
Result: 0
multiplication is invoked
Result: 6000
Divison is invoked
Result: 1
C:\Users\ankit\Desktop>

Assignment3_1. Write an assignment using java on the following situation of A Company ABC:A company consists of different types of Employees: Engineer, Secretary, and Manager.Director is there who is a special type of Manager. Each employee should have Some detail information. The name of the company will be provided by an interface.The objective is that: after creation of the different instances of different employees with some adequate information they will be asked for personnel details.The output will consists of Employee information such as name, company name, birth date, salary and for director car loan information should be there.

Code :

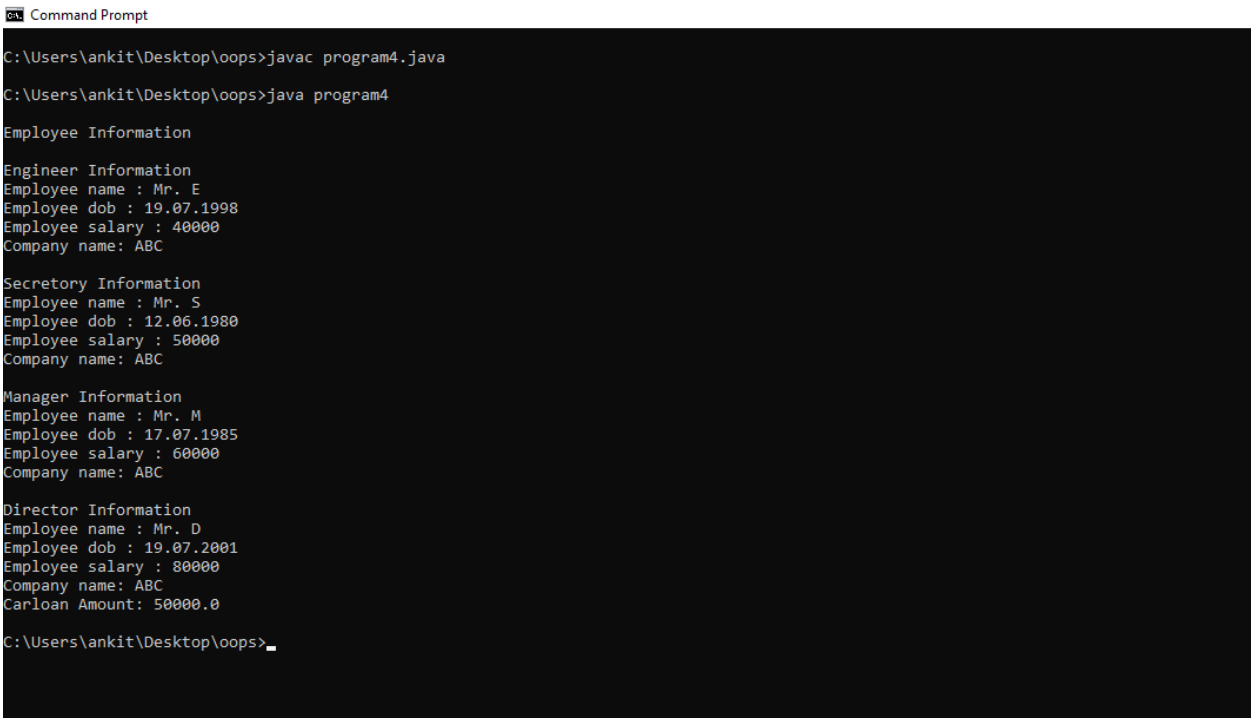
```
interface company
{
	public String cname="ABC";
}
class employee
{
	String ename,ebdate;
	int esalary;
	employee(String ename,String ebdate,int esalary)
	{
		this.ename=ename;
		this.ebdate=ebdate;
		this.esalary=esalary;
	}
	void display()
```

```
        {
                System.out.println("Employee name : "+ename);
                System.out.println("Employee dob : "+ebdate);
                System.out.println("Employee salary : "+esalary);
        }
}
class engineer extends employee implements company
{
        engineer(String s,String s1,int i)
        {
                super(s,s1,i);
        }
        void display()
        {
                super.display();
                System.out.println("Company name: "+cname);
        }
}
class secratory extends employee implements company
{
        secratory(String s,String s1,int i)
        {
                super(s,s1,i);
        }
        void display()
        {
```

```
            super.display();
            System.out.println("Company name: "+cname);
        }
}
class manager extends employee implements company
{
        manager(String s,String s1,int i)
        {
            super(s,s1,i);
        }
        void display()
        {
            super.display();
            System.out.println("Company name: "+cname);
        }
}
class director extends manager
{
        double cloan;
        director(String s,String s1,int i,double cloan)
        {
            super(s,s1,i);
            this.cloan=cloan;
        }
        void display()
        {
```

```
            super.display();
            System.out.println("Carloan Amount: "+cloan);
        }
}
class asg31
{
    public static void main(String args[])
    {
            System.out.println("\nEmployee Information");
            engineer e=new engineer("Mr. E","19.07.1998",40000);
            System.out.println("\nEngineer Information");
            e.display();
            secratory e1=new secratory("Mr. S","12.06.1980",50000);
            System.out.println("\nSecretory Information");
            e1.display();
            manager e2=new manager("Mr. M","17.07.1985",60000);
            System.out.println("\nManager Information");
            e2.display();
            director e3=new director("Mr. D","19.07.2001",80000,50000);
            System.out.println("\nDirector Information");
            e3.display();
    }
}
```

Output :


Command Prompt
C:\Users\ankit\Desktop\oops>javac program4.java
C:\Users\ankit\Desktop\oops>java program4
Employee Information
Engineer Information
Employee name : Mr. E
Employee dob : 19.07.1998
Employee salary : 40000
Company name: ABC
Secretory Information
Employee name : Mr. S
Employee dob : 12.06.1980
Employee salary : 50000
Company name: ABC
Manager Information
Employee name : Mr. M
Employee dob : 17.07.1985
Employee salary : 60000
Company name: ABC
Director Information
Employee name : Mr. D
Employee dob : 19.07.2001
Employee salary : 80000
Company name: ABC
Carloan Amount: 50000.0
C:\Users\ankit\Desktop\oops>

Assignment3_2. Write a program to implement the concept of interface inheritance.

Code :

```
interface printable
{
	void print();
}
interface showable extends printable
{
	void show();
}
class hello implements showable
{
	public void print()
	{
		System.out.println("We are in the printable method");
	}
	public void show()
	{
		System.out.println("We are in the showable method");
	}
}
class asg32
{
```

```
        public static void main(String args[])
        {
                hello ob=new hello();
                ob.print();
                ob.show();
        }
}
```

Output :