



DEPARTMENT OF INFORMATION TECHNOLOGY
20CSPL301 – Object Oriented Programming Lab

Ex No 1

1. Basic JAVA Programs

- a. Write a program to find the sum of individual digits of a positive integer.

```
import java.util.Scanner;
```

```
public class ExNo1_a {  
    public static void main(String args[])  
    {  
        System.out.println("Enter a Number");  
        Scanner sc = new Scanner(System.in);  
        int number = sc.nextInt();  
        int sum =0;  
        int res=0;  
        sc.close();  
        //LOOP - Logic for calculating sum of n digits  
        if(number>0)  
        {  
            while(number>0)  
            {  
                res = number%10;  
                sum = sum+res;  
                number = number/10;  
            }  
            System.out.println("Sum of Digits of the Numebr "+number+" is = ");  
            System.out.println(sum);  
        }  
        else  
        {  
            System.out.println("Enter a Positive Number");  
        }  
    }  
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY

20CSPL301 – Object Oriented Programming Lab

b. Write a program to generate the first n terms of the sequence.

```
import java.util.Scanner;
public class ExNo1_b {

    public static void main(String args[])
    {
        System.out.println("Enter a Length of the Fibonacci Sequence to be printed");
        Scanner sc = new Scanner(System.in);
        int length = sc.nextInt();
        sc.close();
        int n1=0;
        int n2=1;
        int fibonacci_num=0;
        if(length >0)
        {
            System.out.println("Fibonacci Sequence of "+length+" Terms is ...");
            System.out.print(n1+ " "+n2+" ");
            for(int i=1;i<length-1;i++)
            {
                fibonacci_num= n1+n2;
                n1 = n2;
                n2 = fibonacci_num;
                System.out.print(fibonacci_num+" ");
            }

        }
        else
        {
            System.out.println("Enter a correct number");
        }
    }
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY
20CSPL301 – Object Oriented Programming Lab

- c. Write a program to generate all the prime numbers between 1 and n,
where n is a value supplied by the user

```
import java.util.Scanner;
public class ExNo1_c {
    public static void main(String[] args)
    {
        int i, number, count;

        System.out.println("Enter the N range = ");
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        if(n>0)
        {
            System.out.println(" Prime Numbers from 1 to "+n+" are : ");
            for(number = 1; number <= 100; number++)
            {
                count = 0;
                for (i = 2; i <= number/2; i++)
                {
                    if(number % i == 0)
                    {
                        count++;
                        break;
                    }
                }
                if(count == 0 && number != 1 )
                {
                    System.out.print(number + " ");
                }
            }
        }
        else
        {
            System.out.println("Enter a correct Range");
        }
    }
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY

20CSPL301 – Object Oriented Programming Lab

- d. Write a program to find both the largest and smallest number in a list of integers

```
public class ExNo1_d {  
    public static void main(String[] args) {  
        int numbers[] = new int[]{33,53,73,94,22,45,23,87,13,63};  
        int smallest = numbers[0];  
        int biggest = numbers[0];  
  
        for(int i=1; i< numbers.length; i++)  
        {  
            if(numbers[i] > biggest)  
                biggest = numbers[i];  
            else if (numbers[i] < smallest)  
                smallest = numbers[i];  
        }  
  
        System.out.println("Largest Number is : " + biggest);  
        System.out.println("Smallest Number is : " + smallest);  
    }  
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY 20CSPL301 – Object Oriented Programming Lab

e. Write a program to find factorial of list of number reading input as command.

```
import java.util.Scanner;
public class ExNo_1e {
    public static void main(String args[]){
        int i,fact=1;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a number to find its Factorial = ");
        int number=sc.nextInt();//It is the number to calculate factorial
        if(number>0)
        {
            for(i=1;i<=number;i++){
                fact=fact*i;
            }
            System.out.println("Factorial of "+number+" is: "+fact);
        }
        else
        {
            System.out.println("Enter a valid number");
        }
    }
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY 20CSPL301 – Object Oriented Programming Lab

Ex No 2

Write a program to calculate bonus for different departments using method overriding

```
import java.util.*;
abstract class dept
{
    double bp;
    dept(double bpay)
    {
        bp=bpay;
    }
    void disp()
    {
        System.out.println("basicpay= "+bp);
    }
    abstract double bonus();
}
class sales extends dept
{
    sales(double bpay)
    {
        super(bpay);
    }
    public double bonus()
    {
        return(0.20*bp);
    }
}
class marketing extends dept
{
    marketing(double bpay)
    {
        super(bpay);
    }
    public double bonus()
    {
        return(0.30*bp);
    }
}
class hr extends dept
{
    hr(double bpay)
    {
        super(bpay);
    }
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY
20CSPL301 – Object Oriented Programming Lab

```
public double bonus()
{
    return(0.50*bp);
}

public class ExNo2_Program {
    public static void main(String arg[])
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter basic pay = ");
        double bp=sc.nextDouble();
        sales s=new sales(bp);
        s.disp();
        System.out.println("Bonus for sales dept = " +s.bonus());
        marketing m=new marketing(bp);
        m.disp();
        System.out.println("Bonus for marketing dept = " +m.bonus());
        hr h=new hr(bp);
        h.disp();
        System.out.println("Bonus for hr dept = " +h.bonus());
    }
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY
20CSPL301 – Object Oriented Programming Lab

Ex No 3

Write a program to sort list of elements in ascending and descending order and show the exception handling

```
import java.util.*;
public class ExNo3 {

    public static void main(String[] args)
    {
        try
        {
            Scanner sc=new java.util.Scanner(System.in);
            System.out.print("Enter the array size: ");
            int size=sc.nextInt();
            int[] arr=new int[size];
            System.out.println("Enter Array elements: ");
            for(int i=0;i<size;i++)
            {
                System.out.print("Element No. "+(i+1)+" : ");
                arr[i]=sc.nextInt();
            }
            System.out.print("Before Sorting: ");
            for(int i=0;i<size;i++)
            System.out.print(" "+arr[i]);
            for(int i=0;i<size;i++)
            {
                int temp;
                for(int j=i+1;j<size;j++)
                {
                    if(arr[i]>arr[j])
                    {
                        temp=arr[i];
                        arr[i]=arr[j];
                        arr[j]=temp;
                    }
                }
            }
            System.out.println();
            System.out.print("After Sorting in ascending order: ");
            for(int i=0;i<size;i++)
            {
                System.out.print(" "+arr[i]);
            }
        }
    }
}
```




DEPARTMENT OF INFORMATION TECHNOLOGY
20CSPL301 – Object Oriented Programming Lab

```
System.out.println();
System.out.print("After Sorting in descending order: ");
for(int i=size-1;i>=0;i--)
{
    System.out.print(" "+arr[i]);
}
}
catch(Exception e)
{
    System.out.println("Enter Correct Input as Number");
}

}
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY 20CSPL301 – Object Oriented Programming Lab

Ex No 4

Write a program to implement the concept of importing classes from user defined package and creating packages

1. Create a Package named Numbers
 - a. In numbers package create a class getNumbers which stores two numbers
 - b. In getNumbers class create a function get(to get two numbers)
 - c. Create a AddNumbers class import the Numbers Package and use the classes and methods available in Numbers Package to add two numbers
 - d. Create a SubNumbers class import the Numbers Package and use the classes and methods available in Numbers Package to sub two numbers

```
package Numbers;  
import java.util.Scanner;  
public class getNumbers  
{  
    public int n1, n2;  
    public void get()  
    {  
        Scanner sc = new Scanner(System.in);  
        System.out.println("Enter N1 = ");  
        n1 = sc.nextInt();  
        System.out.println("Enter N2 = ");  
        n2 = sc.nextInt();  
    }  
}
```

javac -d Numbers getNumbers.java will create package named Numbers

```
import Numbers.*;  
public class AddNumbers  
{  
    public static void main(String args[])  
    {  
        Numbers.getNumbers obj = new Numbers.getNumbers();  
        obj.get();  
        int sum = obj.n1+obj.n2;  
        System.out.println("Sum =" +sum);  
    }  
}
```



DEPARTMENT OF INFORMATION TECHNOLOGY 20CSPL301 – Object Oriented Programming Lab

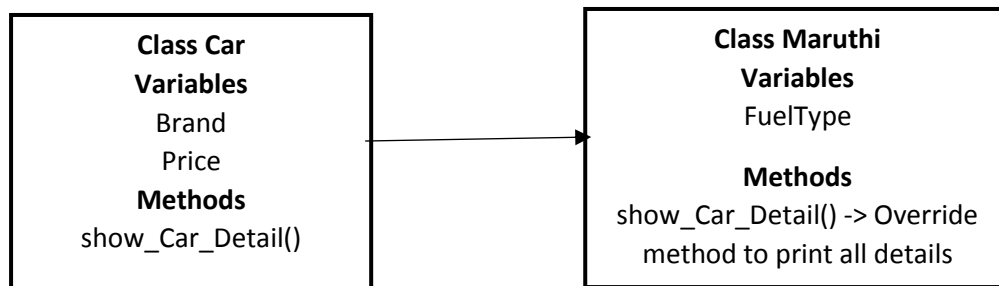
```
import Numbers.*;
public class SubNumbers
{
    public static void main(String args[])
    {
        Numbers.getNumbers obj = new Numbers.getNumbers();
        obj.get();
        int diff = obj.n1-obj.n2;
        System.out.println("Difference =" +diff);
    }
}
```

Ex No 5

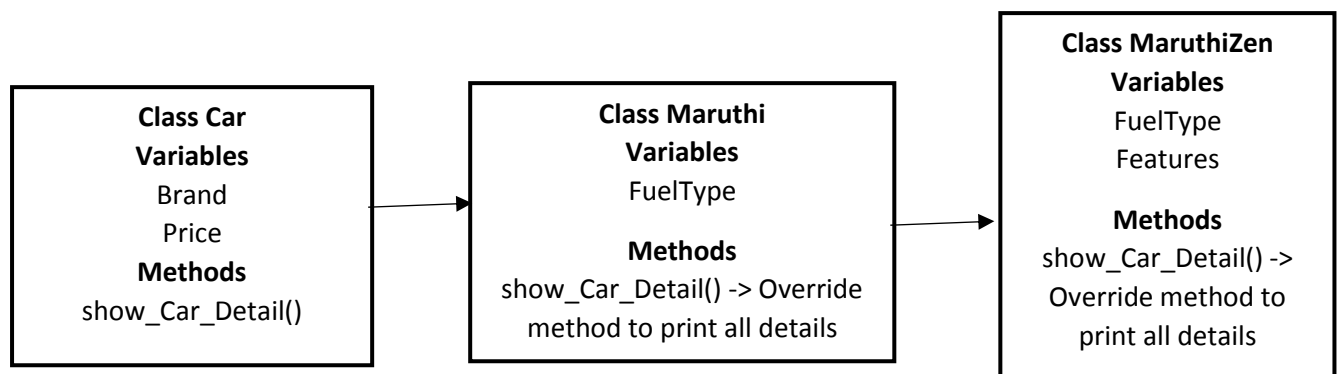
Write programs that illustrate how the following forms of inheritance are supported:

- a) Single inheritance
- b) Multiple inheritance
- c) Multi level inheritance
- d) Hierarchical inheritance

Single Inheritance



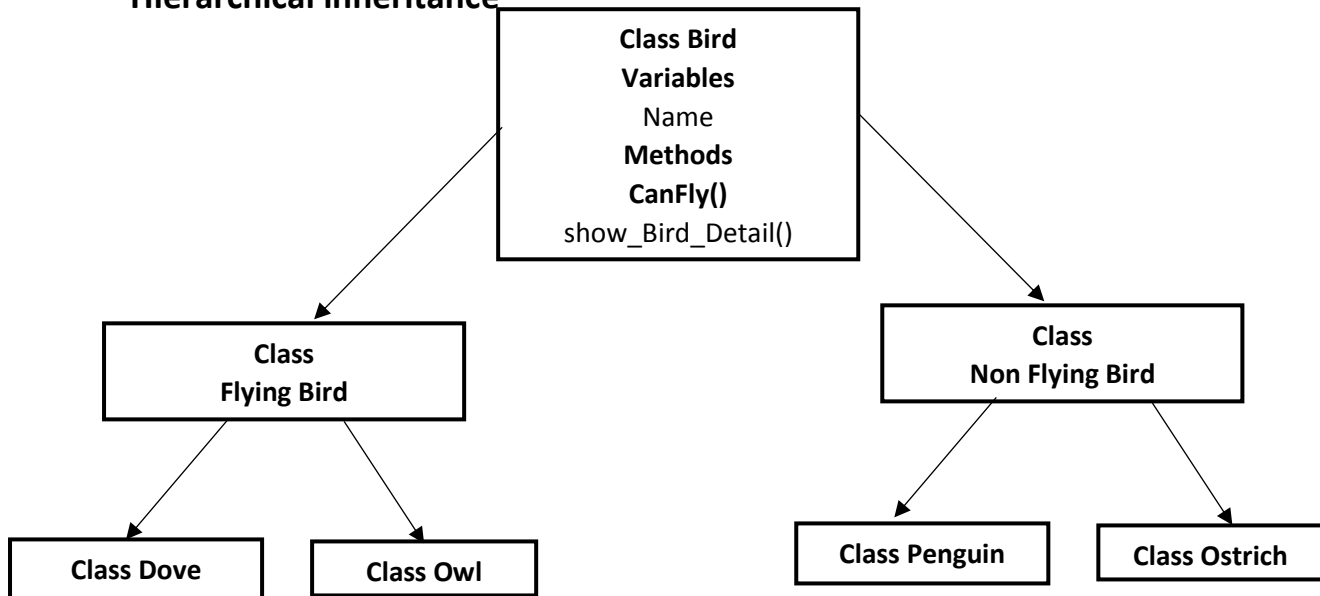
Multilevel inheritance





DEPARTMENT OF INFORMATION TECHNOLOGY 20CSPL301 – Object Oriented Programming Lab

Hierarchical inheritance



- Add appropriate methods to appropriate classes
- Use Method Overriding

Multi-level inheritance

