Concepts of Object Oriented Programming Language
(Fundamental programs of Java)

1. Hello World Program

```
public class Hello{
   public static void main(string args[])
{
   System.out.println("Hello World");
}
}
//OUTPUT
//Hello World
```

2. AREA OF CIRCLE

```
import java.util.Scanner;
public class Area{
   public static void main(String a[]){
      Scanner myObj= new Scanner(System.in);
      double rad, area;
      System.out.println("Enter the radius");
      rad=myObj.nextDouble();
      area=3.14*rad*rad;
      System.out.println("The area is; "+area);
   }
}
// OUTPUT--
// Enter the radius
// 7
// The area is; 153.86
```

3. ARMSTRONG NUMBER

```
import java.util.Scanner;
public class Armstrong{
   public static void main(String ar[])
   {
      Scanner myObj=new Scanner(System.in);
```

```
        System.out.println("Enter the number");
        int n,z;
        n=myObj.nextInt();
        int k=0, a=n;
        while(n>0)
        {
           n=n/10;
           k++;
        }
        n=a;
        int sum=0;
        for(int i=0; i<k; i++)
        {

           z=n%10;
           sum+=z*z*z;
           n=n/10;
        }
        n=a;
        if(sum==a)
        System.out.println("ARMSTRONG NUMBER");
        else
        System.out.println("NOT ARMSTRONG NUMBER");
    }
}
// OUTPUT--
// Enter the number
// 153
// ARMSTRONG NUMBER
```

4. Binary search

```
import java.util.*;
public class Binary {
   public static void main(String[] args){
      int n;
      System.out.print("Enter the length of the array : ");
      Scanner sc = new Scanner(System.in);
      n=sc.nextInt();
      int arr[]= new int[n];
```

```
        System.out.println("Enter the elements of the sorted array.");
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        System.out.println("Enter the number to search : ");
        int x=sc.nextInt();
        boolean found=false;
        int l=0,r=n-1,mid=(l+r)/2;
        while(l<r){
            mid=(l+r)/2;
            if(arr[mid]==x){
                found=true;
                break;
            }
            else if(arr[mid]<x){
                l=mid+1;
            }
            else{
                r=mid-1;
            }
        }
        if(found){
            System.out.println("Found at position "+(mid+1)+".");
        }
        else{
            System.out.println("Not found");
        }
    }
}
/*
Output:
Enter the length of the array : 5
Enter the elements of the sorted array.
2
3
4
5
6
Enter the number to search :
```

```
5
Found at position 4.
 */
```

5. **Number of digit in given number**

```
import java.util.*;
public class Digits {
   public static void main(String[] args){
      int n;
      System.out.print("Enter the number: ");
      Scanner sc=new Scanner(System.in);
      n=sc.nextInt();
      int digit=0;
      while(n!=0){
         n/=10;
         digit++;
      }
      System.out.println("Number of digit is "+digit+".");
   }
}
// Output:
// Enter the number: 19991
// Number of digit is 5.
```

5. **To check given number is even number or not**

```
import java.util.Scanner;
public class Evenodd{
   public static void main(String a[]){
      Scanner myObj= new Scanner(System.in);
      System.out.println("Enter the number");
      int n;
      n=myObj.nextInt();
      if(n%2==0)
      System.out.println("EVEN NUMBER");
      else
      System.out.println("ODD NUMBER");
   }
}
// OUTPUT--
// Enter the number
// 4
```

```
// EVEN NUMBER

// Enter the number
// 23
// ODD NUMBER
```

7. **Factor of the number**

```
import java.util.*;
public class Factors {
   public static void main(String[] args){
      int n;
      System.out.print("Enter the number: ");
      Scanner sc=new Scanner(System.in);
      n=sc.nextInt();
      System.out.print("Factors are : ");
      for(int i=1;i<=n;i++){
         if(n%i==0)
         System.out.print(i+" ");
      }
      System.out.println();
   }
}
// Output:
// Enter the number: 30
// Factors are : 1 2 3 5 6 10 15 30
```

8. **FIBONACCI SERIES**

```
import java.util.Scanner;
public class Fibonacci{
   public static void main(String ar[]){
      Scanner myObj= new Scanner(System.in);
      int n;
      System.out.println("Enter the number of elements of the
fibonacci series");
      n=myObj.nextInt();
      int a=0, temp, b=1;
      for(int i=1; i<=n; i++)
      {
         if(n==1)
         System.out.println(""+a);
         else if(n==2)
```

```
            System.out.println(""+b);
            else
            {
               System.out.println(""+(a+b));
               temp=a;
               a=b;
               b=temp+b;
            }
         }
      }
   }
// OUTPUT--
// Enter the number of elements of the fibonacci series
// 5
// 1
// 2
// 3
// 5
// 8
```

9. **GCD number**

```
import java.util.*;
public class Gcd {
   public static void main(String[] args){
      int a,b;
      System.out.println("Enter the number two numbers.");
      Scanner sc=new Scanner(System.in);
      a=sc.nextInt();
      b=sc.nextInt();
      int gcd=1;
      while(a!=0){
         int temp=a;
         a=b%a;
         b=temp;
         gcd=b;
      }
      System.out.println("GCD is "+gcd+".");
   }
}
// Output:
```

```
// Enter the number two numbers.
// 15 25
// GCD is 5.
```

10. **PRINT INTEGERS**

```
import java.util.Scanner;
public class Integers{
   public static void main(String a[]){
   Scanner myObj= new Scanner(System.in);
   int n;
   System.out.println("enter the number of integers");
   n= myObj.nextInt();
for(int i=1; i<=n; i++)
{
   System.out.println(""+i);
}
   }
}
//Output--
// enter the number of integers
// 4
// 1
// 2
// 3
// 4
```

11. **Linear search**

```
import java.util.*;
public class Linear{
   public static void main(String[] args){
      int n;
      System.out.print("Enter the length of the array : ");
      Scanner sc = new Scanner(System.in);
      n=sc.nextInt();
      int arr[]= new int[n];
      System.out.println("Enter the elements of the array.");
      for(int i=0;i<n;i++){
         arr[i]=sc.nextInt();
      }
      System.out.println("Enter the number to search : ");
      int x=sc.nextInt();
```

```
        boolean found=false;
        int i;
        for(i=0;i<n;i++){
           if(arr[i]==x){
              found=true;
              break;
           }
        }
        if(found){
           System.out.println("Found at position "+(i+1)+".");
        }
        else{
           System.out.println("Not found");
        }
     }
}
/*
Output:
Enter the length of the array : 5
Enter the elements of the array.
2
4
5
6
7
Enter the number to search :
5
Found at position 3.
 */
```

12**. Palindrome number**

```
import java.util.*;
public class Palindrome{
   public static void main(String[] args){
      int n;
      System.out.print("Enter the number: ");
      Scanner sc=new Scanner(System.in);
      n=sc.nextInt();
      int rev=0,temp=n;
      while(temp!=0){
```

```
            rev*=10;
            rev+=temp%10;
            temp/=10;
        }
        if(rev==n){
            System.out.println("Palindrome");
        }
        else{
            System.out.println("Not Palindrome");
        }
    }
}
// Output:
// Enter the number: 1331
// Palindrome
```

13. **PRIME NUMBER**

```
import java.util.Scanner;
public class Prime{
    public static void main(String a[]){
        Scanner myObj= new Scanner(System.in);
        System.out.println("Enter the number");
        int n;
        n=myObj.nextInt();
        int k=0;
        for(int i=2; i<n; i++)
        {
            if(n%i==0)
            k=1;
        }
        if(k==0)
        System.out.println("PRIME NUMBER");
        else
        System.out.println("NOT PRIME NUMBER");
    }
}
// OUTPUT--
// Enter the number
// 7
// PRIME NUMBER
```

```
// Enter the number
// 10
// NOT PRIME NUMBER
```

14. **Prime number between two numbers**

```
import java.util.*;
public class Primefn{
   public static boolean checkprime(int n){
      for(int i=2;i*i<=n;i++){
         if(n%i==0){
            return false;
         }
      }
      return true;
   }
   public static void main(String args[]){
      System.out.println("Enter two numbers between which prime
numbers are to be found out.");
      int a,b;
      Scanner sc = new Scanner(System.in);
      a=sc.nextInt();
      b=sc.nextInt();
      for(int i=a+1;i<b;i++){
         boolean prime=checkprime(i);
         if(prime){
            System.out.print(i+" ");
         }
      }
      System.out.println();
   }
}
/*
Output:
Enter two numbers between which prime numbers are to be found
out.
1
25
2 3 5 7 11 13 17 19 23
 */
```

15. **Print pyramid**

```
import java.util.*;

public class Pyramid{
   public static void main(String[] args){
      int n;
      System.out.print("Enter the height of pyramid : ");
      Scanner sc=new Scanner(System.in);
      n=sc.nextInt();
      for(int i=1;i<=n;i++){
         for(int j=i;j<=n-1;j++){
            System.out.print(" ");
         }
         for(int j=1;j<=2*i-1;j++){
            System.out.print("*");
         }
         System.out.println();
      }
   }
}
// Output:
// Enter the height of pyramid : 7
//       *
//      ***
//     *****
//    *******
//   *********
//  ***********
// *************
```

16. **Sorting**

```
import java.util.*;

public class Quick {
   static void swap(int[] arr, int i, int j) {
      int temp = arr[i];
      arr[i] = arr[j];
      arr[j] = temp;
   }
```

```
    static int partition(int[] arr, int low, int high) {
        int pivot = arr[high];
        int i = (low - 1);
        for (int j = low; j <= high - 1; j++) {
            if (arr[j] < pivot) {
                i++;
                swap(arr, i, j);
            }
        }
        swap(arr, i + 1, high);
        return (i + 1);
    }
    static void quickSort(int[] arr, int low, int high) {
        if (low < high) {
            int pi = partition(arr, low, high);
            quickSort(arr, low, pi - 1);
            quickSort(arr, pi + 1, high);
        }
    }
    public static void main(String[] args) {
        int n;
        System.out.print("Enter the length of the array : ");
        Scanner sc = new Scanner(System.in);
        n=sc.nextInt();
        System.out.println("Enter elements of array.");
        int arr[]=new int[n];
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        quickSort(arr,0, n - 1);
        System.out.println("Sorted array: ");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }
}

/*
Output:
```

```
Enter the length of the array : 5
Enter elements of array.
4
3
6
2
10
Sorted array:
2 3 4 6 10
 */
```

17. **Sum of two prime number**

```
import java.util.*;
public class Sumoprime{
   public static boolean checkprime(int n){
      for(int i=2;i*i<=n;i++){
         if(n%i==0){
            return false;
         }
      }
      return true;
   }
   public static void main(String args[]){
      int n;
      System.out.print("Enter the number: ");
      Scanner sc=new Scanner(System.in);
      n=sc.nextInt();
      boolean ans=false;
      int num1=0,num2=0;
      for(int i=2;i<n-1;i++){
         int j=n-i;
         if(checkprime(i)&&checkprime(j)){
            ans=true;num1=i;num2=j;
            break;
         }
      }
      if(ans){
         System.out.println("It can be expressed as sum of two
prime numbers which are "+num1+" and "+num2+".");
      }
```

```
        else{
            System.out.println("It cannot be expressed as sum of two
primes.");
        }
    }
}
/*
Output:
Enter the number: 21
It can be expressed as sum of two prime numbers which are 2 and
19.
 */
```