PROGRAMMING IN JAVA

1.
```java
import java.util.*;

class day6p7 {
    public static boolean ispower(int n) {
             if(n < 3)
             return false;
             while(n % 3 == 0) {
                n /=3;
             }
             return n==1;
    }
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        System.out.println("enter an integer:");
        int n = s.nextInt();
    // int input[] = {27,12,abc@123,1827,-100,0};
     // for(int n:input){
    // System.out.println(n+ ispower(n));}
              if(ispower(n)) {
            System.out.println(n+" is power of 3");
        }
        else
        System.out.println(n + "is not a power of 3");
    }
}
```
2.
```java
import java.util.*;

class day6Aq4 {
    public static void main(String args[]) {
        int a[] = {3,0,1,2};
        int n,missingnum,i,sum,sum1=0;
        Scanner s = new Scanner(System.in);
         System.out.println("enter n:");
         n = s.nextInt();
           sum = (n * (n+1)) / 2;
           for(i=0;i<n;i++)
           sum1 = sum1 + a[i];
           System.out.println("missing number is:"+(sum - sum1));
        }
}
```
3.
```java
public class day6Aq5 {

    public static int maxSubArray(int[] nums) {
        int maxSum = nums[0];
        int currentSum = nums[0];
```

```
        for (int i = 1; i < nums.length; i++) {
            currentSum = Math.max(nums[i], currentSum + nums[i]);
            maxSum = Math.max(maxSum, currentSum);
        }

        return maxSum;
    }

    public static void main(String[] args) {
        int[] nums = {-2, 1, -3, 4, -1, 2, 1, -5, 4};
        int maxSum = maxSubArray(nums);
        System.out.println(maxSum);
    }
}
```

4.

```
class thread1 implements Runnable {

    public void run() {
        System.out.println("thread1 started");
        try {
            Thread.sleep(1000);
        }
        catch(Exception e) {
            System.out.println(e);
        }
        System.out.println("thread1 finished");
    }
}
class thread2 implements Runnable {
    public void run() {
        System.out.println("thread2 started:");
        try {
            Thread.sleep(1500);
        }
        catch(Exception e)
        {
            System.out.println(e);
        }
        System.out.println("thread1 finished");
    }
}
class day6Aq6 {
    public static void main(String args[]) {
        Thread t1 = new Thread(new thread1());
        Thread t2 = new Thread(new thread2());
        try {
        t1.start();
        Thread.sleep(500);
```

```
        t2.start();
        t1.join();
        t2.join();
        System.out.println("All threads are finished");
        }
        catch(Exception e) {
            System.out.println(e);
        }
    }
}
```

5.

```
import java.util.*;

class day6Aq7 {
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        int choice;
        while(true) {
            System.out.println(".....Syntax generator for.....");
            System.out.println("1.if");
            System.out.println("2.switch");
            System.out.println("3.while");
            System.out.println("4.do-while");
            System.out.println("5.for");
            System.out.println("6.exit");
            System.out.println("choos choice:");
            choice = s.nextInt();
            System.out.println("");
            switch(choice) {
                case 1:
                System.out.println("the if");
                System.out.println("if(condition) statement:");
                System.out.println("else statement");
                break;
                case 2:
                System.out.println("switch");
                System.out.println("switch(expression) {");
                System.out.println("case constant:");
                System.out.println("statemenr sequence");
                System.out.println("break");
                System.out.println("}");
                break;
                case 3:
                System.out.println("while");
                System.out.println("while condition statement");
                break;
                case 4:
                System.out.println("do-while");
                System.out.println("do {");
```

```
                System.out.println("statment");
                System.out.println("} while (condition)");
                break;
                case 5:
                System.out.println("for");
                System.out.println("for(init:condition:iteration)");
                System.out.println("statement");
                break;
                default:
                System.out.println("enter correct choice:");
                break;
            }
        }
    }
}
```

6.

```
class superclass {

    int x;
    public superclass(int x) {
        this.x = x;
    }
     public void display()
     {
         System.out.println("value of X in super class:"+x);
     }
    }
    class subclass extends superclass {
        int y;
        public subclass(int x,int y) {
             super(x);
              this.x = x;
              this.y = y;
        }
        public void display() {
            System.out.println("value of X  & Y in sub class:"+x +","+ y);
        }
    }
    class day6p5 {
        public static void main(String args[]) {
            subclass s = new subclass(100,200);
            s.display();
        }
    }
```

7.

```
class overload {

    public void print(int a) {
        System.out.println("a = "+a);
```

```
    }
    public void print(int a,int b) {
        System.out.println("a = " + a + "," + b +"="+"b");
    }
    public static void main(String args[]) {
        overload o = new overload();
        o.print(7);
        o.print(7,9);
    }
}
```

8.

```
import java.util.*;


public class CountDistinctCharacters {
    public static void main(String[] args) {
        String str = "hello world";
        Map<Character, Integer> charCountMap = new HashMap<>();

        // iterate through the characters of the string
        for (char c : str.toCharArray()) {
            // check if the character is already in the map
            if (charCountMap.containsKey(c)) {
                // if yes, increment its count by 1
                charCountMap.put(c, charCountMap.get(c) + 1);
            } else {
                // if no, add the character to the map with count 1
                charCountMap.put(c, 1);
            }
        }

        // print the distinct characters and their count
        for (Map.Entry<Character, Integer> entry : charCountMap.entrySet()) {
            System.out.println(entry.getKey() + " : " + entry.getValue());
 }
}
}
```

9.

```
import java.io.*;

import java.util.*;
class perfectsquares {
    public static void square(int  l,int r) {
        for(int i=l;i<=r;i++) {
            if(Math.sqrt(i) == (int) Math.sqrt(i))
            System.out.print(i+" ");
        }
    }
    public static void main(String args[]) {
          square(2,24);
```

```
    }
}
```

10.

```
import java.util.*;

class secondelementsquare {
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        System.out.println("enter lower range:");
        int l = s.nextInt();
        System.out.println("enter higher range:");
        int r = s.nextInt();
        int size = r - l + 1;
        int a[][] = new int[size][2];
        for(int i=0;i<size;i++){
            int number = l + i;
            int square = number * number;
            a[i][0] = number;
            a[i][1] = square;
        }
        System.out.println("[");
        for(int i=0;i<size;i++) {
            System.out.print("(" + a[i][0] + ","+a[i][1] + ")");
            if(i != size-1) {
                System.out.println(",");
            }
        }
        System.out.println("]");

    }
}
```

11.

```
import java.util.*;

class day7test2 {
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        System.out.println("enter a string:");
        String s1 = s.nextLine();
        Set<Character> unique = new HashSet<>();
        Set<Character> nonunique = new HashSet<>();
        for(char c:s1.toCharArray()) {
            if(nonunique.contains(c)) {
                continue;
            }
            if(unique.contains(c)) {
                unique.remove(c);
                nonunique.add(c);
            }
            else {
```

```
                unique.add(c);
            }
        }
        System.out.println("unique characters in the string:");
        for(char c:unique) {
            System.out.print(c +" ");
        }

    }
}
```

12.

```
import java.util.*;
class day7test3 {
    public static void main(String args[]) {
      Scanner s = new Scanner(System.in);
      System.out.println("enter a number:");
      int n = s.nextInt();
      while(!ispalindrome(n)) {
        int reversednum = reversenumber(n);
        int sum = n + reversednum;
        System.out.println(n + "+ "+reversednum + "="+sum);
        n = sum;
      }
    }
    public static boolean ispalindrome(int n) {
        int originalnum = n;
        int reversednum = 0;
        while(n != 0) {
            int rem = n % 10;
            reversednum = reversednum * 10 + rem;
            n = n / 10;
        }
        return originalnum == reversednum;
    }
    public static int reversenumber(int n) {
        int reversednum = 0;
    while(n != 0) {
            int rem = n % 10;
            reversednum = reversednum * 10 + rem;
            n = n / 10;
        }
        return reversednum;
    }
}
```

13.

```
import java.util.*;
```

```
class sorter<t extends Comparable<t>> {
    private t[] array;
    public sorter(t[] array) {
        this.array = array;
    }
    public void sort() {
        Arrays.sort(array);
    }
    public t[] getArray() {
        return array;
    }
    public static void main(String args[]) {
        Integer[] intArray = {3,1,4,1,5,9,2,6,5,3};
        sorter<Integer> s = new sorter<>(intArray);
        s.sort();
        Integer[] sortedIntArray = s.getArray();
        System.out.println(Arrays.toString(sortedIntArray));
    }
}
/*
 class test<t,u>
 {
    t t1;
    u t2;
    test(t t1,u t2) {
        this.t1 = t1;
        this.t2 = t2;
    }
    public void print() {
        System.out.println(t1);
        System.out.println(t2);
    }
 }
 class main{
    public static void main(String args[]) {
        test <String,Integer> obj = new test<String,Integer>("vishnu",7);
        obj.print();
    }
 }
 */
```

14.

```
class customer {

    private int Acno;
    private int bal=10000;
    public static synchronized void deposit(int amount) {
        System.out.println("amount deposited:"+amount);
        bal = bal + amount;
        System.out.println("amount deposited:"+amount);
```

```
        try {
            Thread.sleep(1000);
        }
        catch(Exception e) {
            System.out.println(e);
        }
    }
    public synchronized void withdraw(int amount) {
        if(bal >= amount) {
      System.out.println("amount withdrawn:"+amount);
      bal = bal - amount;
      System.out.println("amount after withdrwn:"+bal);
      try {
        Thread.sleep(1000);
      }
      catch(Exception e) {
        System.out.println(e);
      }
     }
     else {
        System.out.println("you cannot withdraw money"+amount);
        System.out.println("your balance is:"+bal);
        try {
            Thread.sleep(1000);
        }
        catch(Exception e) {
            System.out.println(e);
        }
     }
}
class thread1 extends Thread {
    customer c;
    int dollar;
    thread1(customer c,int money) {
        this.c = c;
        this.dollar = money;
    }
    public void run() {
        c.withdraw(dollar);
    }
}
class thread2 extends Thread {
    customer c;
    int dollar;
    thread2(customer c,int money) {
        this.c = c;
        this.dollar = money;
    }
```

```
    public void run() {
        c.deposit(dollar);
    }
}
class day6Aq9 {
    public static void main(String args[]) {
        customer obj = new customer();
        thread1 t1 = new thread1(obj,2000);
        thread2 t2 = new thread2(obj,4000);
        thread1 t3 = new thread1(obj,2000);
        thread1 t4 = new thread1(obj,500);
        t1.start();
        t2.start();
        t3.start();
        t4.start();

    }
}
```

15.

```
import java.util.*;

class day6AQuestion20 {
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        System.out.println("enter number:");
        int n = s.nextInt();
        int n1=0,n2=0;
        while(n !=0) {
            if(n % 2 == 0) {
                n = n / 2;
                n1++;
            }
            else{
                n = (n - 1);
                n2++;
            }
        }
           System.out.println("number of steps taken:"+(n2+n1));
    }
}
```