**Q1.**

import java.util.\*;

public class bts{

public static void main(String []args){

Scanner in = new Scanner(System.in);

System.out.println("Enter the alphabet in upper case");

char c1=in.next().charAt(0);

int c2=(int)c1;

c2=c2+ 32;

char c3=(char)c2;

System.out.println("The alphabet in lower case is-"+c3);

}

}

**Q2.(i)**

import java.util.\*;

public class months{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the month number");

int a=in.nextInt();

if (a==1){

System.out.println("The month number is 1 and month is January");

}

else if (a==2){

System.out.println("The month number is 2 and month is February");

}

else if (a==3){

System.out.println("The month number is 3 and month is March");

}

else if (a==4){

System.out.println("The month number is 4 and month is April");

}

else if (a==5){

System.out.println("The month number is 5 and month is May");

}

else if (a==6){

System.out.println("The month number is 6 and month is June");

}

else if (a==7){

System.out.println("The month number is 7 and month is July");

}

else if (a==8){

System.out.println("The month number is 8 and month is August");

}

else if (a==9){

System.out.println("The month number is 9 and month is September");

}

else if (a==10){

System.out.println("The month number is 10 and month is October");

}

else if (a==11){

System.out.println("The month number is 11 and month is November");

}

else if (a==12){

System.out.println("The month number is 12 and month is December");

}

else{

System.out.println("You entered an invalid number");

}

}

}

**(ii)**

import java.util.\*;

public class months1{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the month number");

int a=in.nextInt();

switch (a)

{case 1:

System.out.println("The month number is 1 and month is January");

break;

case 2:

System.out.println("The month number is 2 and month is February");

break;

case 3:

System.out.println("The month number is 3 and month is March");

break;

case 4:

System.out.println("The month number is 4 and month is April");

break;

case 5:

System.out.println("The month number is 5 and month is May");

break;

case 6:

System.out.println("The month number is 6 and month is June");

break;

case 7:

System.out.println("The month number is 7 and month is July");

break;

case 8:

System.out.println("The month number is 8 and month is August");

break;

case 9:

System.out.println("The month number is 9 and month is September");

break;

case 10:

System.out.println("The month number is 10 and month is October");

break;

case 11:

System.out.println("The month number is 11 and month is November");

break;

case 12:

System.out.println("The month number is 12 and month is December");

break;

default:

System.out.println("You entered an invalid number");

}

}

}

**Q3.**

import java.util.\*;

public class q3{

public static void main(String []args){

int a,i,j,k;

k=0;

Scanner in = new Scanner(System.in);

System.out.println("Enter the number");

a=in.nextInt();

while(a!=1){

if(a%2==0){

a=a/2;

k++;

}

else if(a%2==1){

a=a\*3+ 1;

k++;

}

System.out.println(a);

}

System.out.println("The number of operations performed are "+k);

}

}

**Q4. (a) for loop**

**(i)**

import java.util.\*;

public class q4i{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

int sum=1;

for(int i=0;i<n;i++){

sum=sum+(5\*i);

}

System.out.println("The sum of the series is="+sum);

}

}

**(ii)**

import java.util.\*;

public class q4ii{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=1;

int fact=1;

for(int i=0;i<n;i++){

fact=fact\*(i+ 1);

sum=sum+(((Math.pow(-1,i+ 1))\*(i+ 1))/fact);

}

System.out.println("The sum of the series is="+sum);

}

}

**(iii)**

import java.util.\*;

public class q4iii{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of x");

double x=in.nextDouble();

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=0;

int fact=1;

for(int i=1;i<=n;i++){

sum=sum+(Math.pow(x,(2\*i)- 1)/fact);

fact=fact\*(i+ 1)\*(i+ 2);

}

System.out.println("The sum of the series is="+sum);

}

}

**(iv)**

import java.util.\*;

public class q4iv{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

int sum=0;

for(int i=1;i<=n;i++){

sum=sum+(int)Math.pow(i,2);

}

System.out.println("The sum of the series is="+sum);

}

}

**(v)**

import java.util.\*;

public class q4v{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=0;

for(int i=1;i<=n;i++){

sum=sum+((Math.pow((2\*i)-1 ,3))\*(Math.pow(-1,i+1)));

}

int sum1=(int)sum;

System.out.println("The sum of the series is="+sum1);

}

}

**(b) while loop**

**(i)**

import java.util.\*;

public class q4i{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

int sum=1;

int i=0;

while (i<n){

sum=sum+(5\*i);

i++;

}

System.out.println("The sum of the series is="+sum);

}

}

**(ii)**

import java.util.\*;

public class q4ii{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=1;

int fact=1;

int i=0;

while (i<n){

fact=fact\*(i+ 1);

sum=sum+(((Math.pow(-1,i+ 1))\*(i+ 1))/fact);

i++;

}

System.out.println("The sum of the series is="+sum);

}

}

**(iii)**

import java.util.\*;

public class q4iii{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of x");

double x=in.nextDouble();

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=0;

int fact=1;

int i=1;

while (i<=n){

sum=sum+(Math.pow(x,(2\*i)- 1)/fact);

fact=fact\*(i+ 1)\*(i+ 2);

i++;

}

System.out.println("The sum of the series is="+sum);

}

}

**(iv)**

import java.util.\*;

public class q4iv{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

int sum=0;

int i=1;

while(i<=n){

sum=sum+(int)Math.pow(i,2);

i++;

}

System.out.println("The sum of the series is="+sum);

}

}

**(v)**

import java.util.\*;

public class q4v{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=0;

int i=1;

while(i<=n){

sum=sum+((Math.pow((2\*i)-1 ,3))\*(Math.pow(-1,i+1)));

i++;

}

int sum1=(int)sum;

System.out.println("The sum of the series is="+sum1);

}

}

**(c) do-while loop**

**(i)**

import java.util.\*;

public class q4i{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

int sum=1;

int i=0;

do{

sum=sum+(5\*i);

i++;

}

while(i<n);

System.out.println("The sum of the series is="+sum);

}

}

**(ii)**

import java.util.\*;

public class q4ii{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=1;

int fact=1;

int i=0;

do{

fact=fact\*(i+ 1);

sum=sum+(((Math.pow(-1,i+ 1))\*(i+ 1))/fact);

i++;

}

while(i<n);

System.out.println("The sum of the series is="+sum);

}

}

**(iii)**

import java.util.\*;

public class q4iii{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of x");

double x=in.nextDouble();

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=0;

int fact=1;

int i=1;

do{

sum=sum+(Math.pow(x,(2\*i)- 1)/fact);

fact=fact\*(i+ 1)\*(i+ 2);

i++;

}

while(i<=n);

System.out.println("The sum of the series is="+sum);

}

}

**(iv)**

import java.util.\*;

public class q4iv{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

int sum=0;

int i=1;

do{

sum=sum+(int)Math.pow(i,2);

i++;

}

while(i<=n);

System.out.println("The sum of the series is="+sum);

}

}

**(v)**

import java.util.\*;

public class q4v{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the value of n");

int n=in.nextInt();

double sum=0;

int i=1;

do{

sum=sum+((Math.pow((2\*i)-1 ,3))\*(Math.pow(-1,i+1)));

i++;

}

while(i<=n);

int sum1=(int)sum;

System.out.println("The sum of the series is="+sum1);

}

}

**Q5.**

import java.util.\*;

public class calculator{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the two numbers");

double a=in.nextInt();

double b=in.nextInt();

System.out.println("Enter the operator");

char c=in.next().charAt(0);

char c1='+';

char c2='-';

char c3='\*';

char c4='/';

char c5='%';

double ans=0;

if(c==c1){

ans=a+b;

System.out.println(a+" "+c1+" "+b+" = "+ans);

}

if(c==c2){

ans=a-b;

System.out.println(a+" "+c2+" "+b+" = "+ans);

}

if(c==c3){

ans=a\*b;

System.out.println(a+" "+c3+" "+b+" = "+ans);

}

if(c==c4){

if(b!=0){

ans=a/b;

System.out.println(a+" "+c4+" "+b+" = "+ans);

}

else{

System.out.println("Error");

}

}

if(c==c5){

if(b!=0){

ans=a%b;

System.out.println(a+" "+c5+" "+b+" = "+ans);

}

else{

System.out.println("Error");

}

}

}

}

**Q6.**

import java.util.\*;

public class HelloWorld{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the number");

int n=in.nextInt();

for(int i=1;i<11;i++){

int table=n\*i;

System.out.println(n+"\*"+i+"="+table);

}

}

}

**Q7. (a) if-else**

import java.util.Scanner;

public class q7{

public static void main(String[]args){

Scanner in=new Scanner(System.in);

System.out.println("Enter a string or integer");

String a=in.nextLine();

int n=a.length();

int c =0;

for(int i=0;i<n;i++){

char q = a.charAt(i);

char w= a.charAt(n-i-1);

if(q==w){

c++;

}

}

if(c==n){

System.out.println("String or integer is palindrome");

}

else

System.out.println("String or integer is not a palindrome");

}

}

**(b) switch-case**

import java.util.Scanner;

public class pal {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

String s = in.nextLine();

int n = s.length();

int i;

int j;

int a[] = new int [n];

int sum=0;

for(i=0;i<(n/2);i++){

a[i] = (int)(s.charAt(i))-(int)(s.charAt(n-i-1));

sum = sum + a[i];

}

switch(sum){

case 0:

System.out.println(" String or a integer is a palindrome ");

break;

default :

System.out.println(" String or a integer is not a palindrome ");

}

}

}

**8. (a) for loop**

import java.util.Scanner;

public class q8 {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.println("Enter the number of numbers");

int n = in.nextInt();

System.out.println("Enter numbers");

int a= in.nextInt();

int max=a;

int min=a;

int i;

for(i=0;i<(n-1);i++){

a = in.nextInt();

if(a>max){

max=a;

}

if(a<min){

min=a;

}

}

System.out.println("Maximum is = " +max);

System.out.println("Minimum is = " +min);

}

}

**(b) while loop**

import java.util.Scanner;

public class q8 {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.println("Enter the number of numbers");

int n = in.nextInt();

System.out.println("Enter numbers");

int a= in.nextInt();

int max=a;

int min=a;

int i=0;

while (i<(n-1)){

a = in.nextInt();

if(a>max){

max=a;

}

if(a<min){

min=a;

}

i++;

}

System.out.println("Maximum is = " +max);

System.out.println("Minimum is = " +min);

}

}

**(a) do-while loop**

import java.util.Scanner;

public class q8 {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

System.out.println("Enter the number of numbers");

int n = in.nextInt();

System.out.println("Enter numbers");

int a= in.nextInt();

int max=a;

int min=a;

int i=0;

do {

a = in.nextInt();

if(a>max){

max=a;

}

if(a<min){

min=a;

}

i++;

}

while (i<(n-1));

System.out.println("Maximum is = " +max);

System.out.println("Minimum is = " +min);

}

}

**Q9.**

import java.util.\*;

public class HelloWorld{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the numbers a and b");

int a=in.nextInt();

int b=in.nextInt();

int min=(a<b)?a:b;

boolean bool=true;

for(int i=2;i<=min;i++){

bool=(a%i==0 && b%i==0);

if(bool==true)

break;

}

if(bool==false){

System.out.println("The given numbers are relatively prime");

}

else{

System.out.println("The given numbers are not relatively prime");

}

}

}

**Q10.**

public class HelloWorld{

     public static void main(String []args){

        for(int i=1;i<=100000;i++){

            int sum=0;

            for(int j=1;j<=i;j++){

                if(i%j==0){

                    sum=sum+j;

                }

            }

            if(sum==(2\*i)){

                System.out.println(i+" is a perfect number");

            }

        }

     }

}

**Q11.**

import java.util.\*;

public class hem\_series{

public static void main(String []args){

Scanner in=new Scanner(System.in);

System.out.println("Enter the number of terms of hemachandra series");

int n=in.nextInt();

int[] hs=new int[n];

hs[0]=1;

hs[1]=2;

for(int i=0;i<(n-2);i++){

hs[i+2]=hs[i+1]+hs[i];

}

for(int i=0;i<n;i++){

System.out.println(hs[i]);

}

}

}