22/09/2022

**Assignment 1**

Q1) Widgets and gizmos

An online retailer sells two products: widgets and gizmos. Each widget weighs 75 grams. Each gizmo weighs 112 grams. Write a program that reads the number of widgets and the number of gizmos in an order from the user. Then your program should compute and display the total weight of the order.

Aim :

To get the number of widgets and gizmos from the user and find it’s total weight and display it

Algorithm :

Get widgets

Get gizmos

widgets=widgets\*75

gizmos=gizmos\*112

Output widgets and gizmos

Code :

import java.util.Scanner;

public class widgets

{

  public static void main(String[] args)

  {

  //widget=75grams, gizmo=112grams

  int w=75; int g=112; double weight;

  int wno; int gno;

  Scanner sc=new Scanner(System.in);

  System.out.println("Enter number of widgets: ");

  wno = sc.nextInt();

  System.out.println("Enter number of gizmos: ");

  gno = sc.nextInt();

  sc.close();

  weight = (((w\*wno)+(g\*gno))\*0.001);

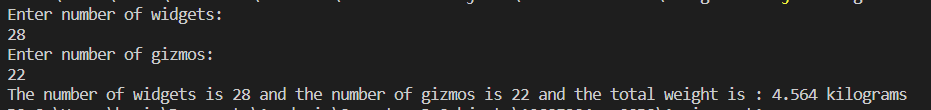
  String weightstr=String.format("The number of widgets is "+wno+" and the number of gizmos is "+gno+" and the total weight is : %.3f kilograms",weight);

  System.out.println(weightstr);

}

}

Input and Output :



Results :

Thus, Program “Widgets and gizmos” has been successfully executed.

Q2) Sign of an integer

Java program to find the sign of an integer. Example: 0 is equal to zero -25 Negative 25 Positive

Aim :

To get an integer as input from the user and display if it is positive, negative or zero

Algorithm :

Get integer

If integer is greater than 0

Output Positive

If integer is lesser than 0

Output Negative

Else

Output Zero

Code :

import java.util.Scanner;

public class signofint {

  public static void main(String[] args)

  {

  int num=0;

  Scanner sc =new Scanner(System.in);

  System.out.println("Enter an integer: ");

  num = sc.nextInt();

  sc.close();

  if (num>0)

  System.out.println("Positive");

  else if (num<0)

  System.out.println("Negative");

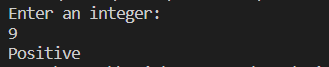
  else

  System.out.println("Zero");

}

}

Input and Output :



Results :

Thus, Program “Sign of an integer” has been successfully executed.

Q3) Duck number

Java program to check for duck number. A duck number is a number which has zeroes present in it but there is no 0 at the beginning of the number. Eg: 010 = NOT duck number. Method : Can use string class to get input in string and convert to character array and find if 0 in the beginning

Aim :

To get an integer as input from the user and to display if it is a duck number or not.

Algorithm :

Get integer

Compute integer length

Check for integer first index

If 0 placed at first index

Output Yes

Else if 0 not at first index

Output No

Code :

import java.util.Scanner;

public class ducknumber {

    public static void main(String args[]) {

        Scanner sc = new Scanner(System.in);

        System.out.print("Enter an integer : ");

        String nstr = sc.nextLine();   //taking number as string

        sc.close();

        int l = nstr.length();

        int ctr = 0;

        char chr;

        for (int i = 1; i < l; i++) {

            chr = nstr.charAt(i);

            if (chr == '0')

                ctr++;

        }

        char f = nstr.charAt(0);    //checking if 0 at 1st index

        if (ctr > 0 && f != '0')

            System.out.println("Duck number");

        else

            System.out.println("Not a duck number");

    }

}

Input and Output :



Results :

The user input has been determined as a duck number and it has been displayed.

Q4) Hexa to Decimal

Write a java program which contains a function "hexToDecimall" that reads a hexadecimal number and prints the decimal value of that hexadecimal number. Your function must throw "NumberFormatException" if an invalid binary number is given as input and the error message "Invalid binary input" should be displayed. The class in catch block is "NumberFormatException" with exception instance as "e". Print the exception if the input is not an Hexadecimal Number.

Aim :

To get a Hexadecimal number as user input and to convert that number to Decimal and display it.

Algorithm :

Get hexnumber as string

Change string to uppercase

Check if entered number is hexadecimal? Yes : No

If Yes, convert hexnumber to decimal

Output hexnumber

Code :

import java.util.\*;

public class hexatodecimal4 {

public static void main(String[] args) {

    hextodecimall();

}

public static boolean check(String hexa) {   //function that checks if number is hexadecimal

    int len=hexa.length();

    for(int i=0; i<len;i++) {

        char a=hexa.charAt(i);

        if(a=='A'||a=='B'||a=='C'||a=='D'||a=='E'||a=='F'||a=='0'||a=='1'||a=='2'||a=='3'||a=='4'||a=='5'||a=='6'||a=='7'||a=='8'||a=='9')

            continue;

        else

            return false;

    }

    return true;

}

public static void hextodecimall () {    //function that converts hexa to decimal and prints it

    Scanner sc = new Scanner(System.in);

    System.out.print("Enter a Hexadecimal number: ");

    String hexa= sc.nextLine();

    hexa = hexa.toUpperCase();

    sc.close();

    try

    {

        if(!check(hexa))

            throw new NumberFormatException();

        Integer resultindecimal = Integer.parseInt(hexa,16);

        System.out.println("The decimal value is : "+resultindecimal);

    }

    catch (NumberFormatException e)

    {

        System.out.print(e);

    }

}

}

Input and Output :



Results :

The Program, “Hexa to Decimal” has been successfully executed.

Q5) Distance of two points

Write a program that prompts the user to enter two points (x1,y1) and (x2,y2) and displays their distance between them. Use double datatype and String.format("%.2f",outputValue);

Aim :

To get x and y coordinates for 2 points from the user and to find and display the distance between them.

Algorithm :

Get x1, x2, x3, x4

Let distance = Square root of ((x1-x2)^2 + (y1-y2)^2 )

Output distance to 2 decimal digits

Code :

import java.util.\*;

import java.lang.Math;

public class distance5

{

    public static void main(String[] args)

    {

        int x1,y1,x2,y2;

        double dist=0;

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter x1 coordinate: ");

        x1 = sc.nextInt();

        System.out.println("Enter y1 coordinate: ");

        y1 = sc.nextInt();

        System.out.println("Enter x2 coordinate: ");

        x2 = sc.nextInt();

        System.out.println("Enter y2 coordinate: ");

        y2 = sc.nextInt();

        dist=Math.sqrt((x1-x2)\*(x1-x2)+(y1-y2)\*(y1-y2));

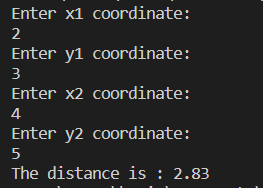
        System.out.println(String.format("The distance is : %.2f ",dist));

        sc.close();

    }

}

Intput and Output :



Results :

Thus, Program “Distance of two points” has been successfully executed

Q6) Composite number

Java program to check for composite number

Aim :

To get an integer from the user as input and to find whether it is a composite number or not and display the result.

Algorithm :

Get number

Check for factors of number :

Iterate from 0 to the number

Check which numbers are divisible by the number = factors

If number has more than 2 factors

Output number is composite

Else

Output number is not composite

Code :

import java.util.Scanner;

public class composite6 {

    public static void main(String[] args) {

        int f=0;

        Scanner sc=new Scanner(System.in);

        System.out.print("Enter a number: ");

        int n=sc.nextInt();

        sc.close();

        for (int i=1;i<n;i++) {

            if(n%i==0) {

                f=f+1;

            }

        }

        if (f>2) {

            System.out.println("Composite");

        }

        else {

            System.out.println("Not composite");

        }

    }

}

Intput and Output :

Graphical user interface

Description automatically generated

Results :

Thus, Program “Composite number” has been successfully executed.

Q7) Physics : aacceleration.

Average acceleration is defined as the change of velocity divided by the time taken to make the change, as shown in the following formula. a=v1-v0/t. Write a program that prompts the user to enter the starting velocity v0 in m/s, and the ending velocity v1 in m/s, and the time spent t in seconds, and displays the average acceleration. Use datatype as double.

Aim :

To have the user enter the starting and ending velocity plus time and calculate and calculate and display the acceleration.

Algorithm :

Get starting velocity v0

Get ending velocity v1

Get time t

Calculate acceleration = (v0-v1)\t

Output acceleration

Code :

import java.util.\*;

class acceleration {

    public static void main(String[] args)

    {

        Scanner sc=new Scanner(System.in);

        float v0,v1,t,a;

        System.out.println("Enter initial velocity: ");

        v0=sc.nextFloat();

        System.out.println("Enter final velocity: ");

        v1=sc.nextFloat();

        System.out.println("Enter time taken: ");

        t=sc.nextFloat();

        sc.close();

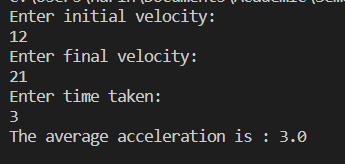
        a=(v1-v0)/t;

        System.out.println("The average acceleration is : "+a);

    }

}

Intput and Output :



Results :

Thus program “Physics : acceleration” has been successfully executed.

Q8) Perimeter of a circle

Java program to calculate the perimeter of circle using radius.

Aim :

To get user input as the radius of a circle and calculate and display the perimeter

Algorithm :

Get radius

Calculate perimeter

Perimeter = 3.14\*radius^2 using math library

Output perimeter

Code :

import java.util.\*;

import java.lang.Math;

class circle

{

    public static void main(String[] args)

{

        Scanner sc=new Scanner(System.in);

        double r,p;

        System.out.println("Enter radius of circle: ");

        r=sc.nextDouble();

        sc.close();

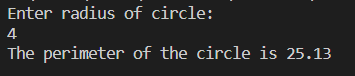
        p=2\*Math.PI\*r;

        System.out.println(String.format("The perimeter of the circle is %.2f",p));

    }

}

Input and Output :



Results :

Thus Program “Perimeter of a circle” has been successfully executed.

Q9) Sum of all digits

You're given an integer N. Write a program to calculate the sum of all the digits of N. Input: the input integer N, Output: calculate the sum of digits of N.

Aim :

Get integer user input from the user and calculate sum of all individual digits of the integer and display the sum result.

Algorithm :

Get number N

Separate the digits of N individually :

Store remainder of N when modulus of 10

Add up the remainders in a sum variable

Output sum

Code :

import java.util.\*;

class sum

{

    public static void main(String[] args)

    {

        Scanner sc=new Scanner(System.in);

        int n=sc.nextInt();

        sc.close();

        int r;

        int s=0;

        while(n>0)

        {

            r=n%10;

            s=s+r;

            n=n/10;

        }

        System.out.println("The sum of the digits is : "+s);

    }

}

Input and Output :

Text

Description automatically generated

Results :

Thus program, “Sum of all digits” has been successfully executed.

Q10) Units of time

Create a program that reads a duration from the user as number of days : hours : minutes : seconds. Compute and display the total number of seconds represented by this duration.

Aim :

Get user input of numbers as days, minutes and hours and compute the total number of seconds and display it

Algorithm :

Get days, hours, minutes and seconds

Multiply days by 86400

Multiply hours by 3600

Multiply minutes by 60

Add all 3 values to seconds

Output seconds

Code :

import java.util.\*;

class time

{

    public static void main(String[] args)

    {

        Scanner sc=new Scanner(System.in);

        int d,h,m,s,ss;

        System.out.println("Enter days: ");

        d=sc.nextInt();

        System.out.println("Enter hours: ");

        h=sc.nextInt();

        System.out.println("Enter minutes: ");

        m=sc.nextInt();

        System.out.println("Enter seconds: ");

        s=sc.nextInt();

        sc.close();

        ss=(d\*86400)+(h\*3600)+(m\*60)+s;

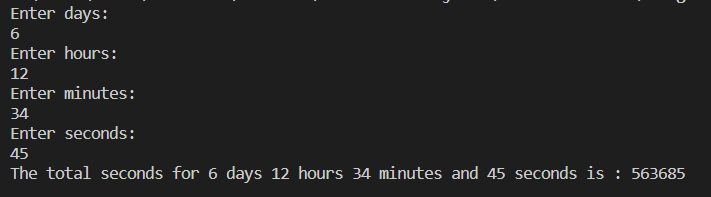
        System.out.println(String.format("The total seconds for %d days %d hours %d minutes and %d seconds is : %d ",d,h,m,s,ss));

        //System.out.print(" : "+ss);

    }

}

Input and Output :



Results :

Thus Program, “Units of time” has been successfully executed.

Q11) Patterns

Write a java program and display the following pattern.

1

12

123

1234

12345

123456

1234567

Aim :

To print the given specified pattern of a right-angled triangle filled with numbers which increase in digits of natural numbers from 1-7

Algorithm :

Iterate i from 1 to 7 (number of rows)

Iterate j from 1 to i (each row)

Output j inside second loop

Output new line outside second loop

Code :

class pattern

{

    public static void main(String[] args)

    {

        for(int i=1;i<=7;i++)

        {

            for(int j=1;j<=i;j++)

            {

                System.out.print(j);

            }

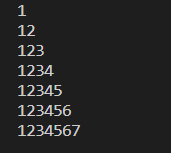
            System.out.print("\n");

        }

    }

};

Intput and Output :



Results :

Thus the above pattern has been successfully printed.

Q12) Tax and tip

The program that you create for this exercise will begin by reading the cost of a meal ordered at a restaurant from the user. Then your program will compute the tax and tip for the meal. Use your local tax rate when computing the amount of tax owing. Compute the tip as 18% of the meal amount (without the tax). The output from your program should include the tax amount, the tip amount and the grand total for the meal including both tax and the tip. Format the output so that all the values are displayed using 2 decimal places. My Tax rate for the meals is 5 percentage.

Aim :

To calculate tax and tip of a meal based on the bill and tax rates along with given tip percentage and to display the result

Algorithm :

Get meal cost

Multiply meal cost by 0.05 to get tax amount

Multiply meal cost by 0.18 to get tip amount

Output meal amount

Output Tax amount individually

Output Meal plus Tax amount

Output Tip amount

Output total cost

Code :

import java.util.\*;

class taxandtip

{

    public static void main(String[] args)

    {

        double meal,tax,tip,tot;

        Scanner sc=new Scanner(System.in);

        System.out.print

        ("Enter cost of the meal: ");

        meal=sc.nextDouble();

        sc.close();

        tax=0.05\*meal;

        tip=0.18\*meal;

        tot=tax+meal+tip;

        System.out.println("Meal = "+meal);

        System.out.println("Tax = "+tax);

        System.out.println("Meal Tax = "+(tax+meal));

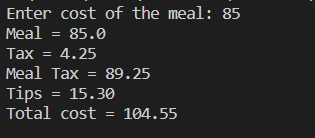
        System.out.println(String.format("Tips = %.2f",tip));

        System.out.println("Total cost = "+tot);

    }

}

Input and Output :



Results :

Thus program “Tax and Tip” has been successfully executed.

Q13) Conversion from Octal to Hexadecimal

Java program to convert from Octal to Hexadecimal number

Aim :

To get user input of a Octal number and to convert it to Hexadecimal and display the result.

Algorithm :

Get octalnumber

Convert the Octal number to decimal :

Separate each individual digit of the octal number

Multiply each digit with a power of 8 by incrementing a variable in a loop

Keep adding the multiplied number in a sum

Print sum, this is Octal to decimal

Convert the Decimal number to octal :

Find remainder of number by modulus 16

Have an array with all digits of hexadecimal – hexaarray

Iterate through a loop and Add array[remainder] to a sum

Decrement a variable of loop by /16 every round

Outside of loop, Output Hexa number

Code :

import java.util.\*;

class octaltohexa {

    public static void main(String arg[])

    {

        int oct, dec=0, i=0;

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Octal Number : ");

        oct = sc.nextInt();

        sc.close();

        while(oct != 0)

        {

            dec =dec + (oct%10) \*(int)Math.pow(8, i);

            i++;

            oct = oct/10;

        }

        String hex=hexdecimal(dec);

        System.out.println("Hexdecimal number is :"+hex);

    }

  static String hexdecimal(int q)

  {

   char a[]={'0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'};

   int rem;

   String hexdec="";

   while(q != 0)

   {

    rem=q%16;

    hexdec= a[rem] + hexdec;

               q= q/16;

   }

        return hexdec;

 }

}

Input and Output :



Results :

Thus, Program “Octal to Hexadecimal” has been successfully executed.