1. Find out if the given number is an Armstrong number. Logic-if 153 is the Supplied value, then 1³+5^3+3^3=1+125+27=153.

- This is the same as supplied value hence it is an Armstrong number.

java

//file name - Armstrong.java

import java.util.Scanner;

import java.lang.Math;

public class Armstrong {

public static void main(String[] args) {

//declaring variables

int n, temp, rem, res = 0, i = 0;

//user input

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

Scanner scanner = new Scanner(System.in);

n = scanner.nextInt();

temp = n;

//determining the power (no. of digits)

for(; temp!= 0; temp/= 10)

{

i++;

}

temp = n;

//implementing armstrong equation

for(; temp!= 0; temp/= 10)

{

rem = temp % 10;

res += Math.pow(rem, i);

}

//validating

if(res == n)

{

System.out.println(n + " is an ArmStrong number.");

}

else

{

System.out.println(n + " is not an ArmStrong number.");

}

}

}

Output:

Enter the number:

153

153 is an ArmStrong number.

2. Find out all the Armstrong numbers falling in the range of 100-999

java

//file name - Armstrong\_range.java

import java.util.Scanner;

import java.lang.Math;

public class Armstrong\_range {

public static void main(String[] args) {

//condiser a loop to initiate the range of numbers

for(int n = 100; n < 1000; n++)

{

//declaring variables

int temp, rem, res = 0, i = 0;

temp = n;

//determining the power (no. of digits)

for(; temp!= 0; temp/= 10)

{

i++;

}

temp = n;

//implementing armstrong equation

for(; temp!= 0; temp/= 10)

{

rem = temp % 10;

res += Math.pow(rem, i);

}

//validating

if(res == n)

{

System.out.println(n + " is an ArmStrong number.");

}

}

}

}

Output:

153 is an ArmStrong number.

370 is an ArmStrong number.

371 is an ArmStrong number.

407 is an ArmStrong number.

3. Find out the simple as well as the compound interest of supplied

java

//file name - SCIntrest.java

import java.util.Scanner;

import java.lang.Math;

public class SCIntrest {

public static void main(String[] args) {

//declaring variables

double rate, amount, years, simple, compound;

//declaring scanner object

Scanner scanner = new Scanner(System.in);

//user input

System.out.println("Enter the amount : ");

amount = scanner.nextDouble();

System.out.println("Enter the rate : ");

rate = scanner.nextDouble();

System.out.println("Enter no. of years : ");

years = scanner.nextDouble();

//implementing the equations for SI and CI

simple = (rate \* years \* amount)/ 100;

compound = amount \* Math.pow(1 + rate/100, years) - amount;

//display

System.out.println("Simple Interest : "+simple);

System.out.println("compound Interest : "+compound);

}

}

Output:

Enter the amount :

10000

Enter the rate :

7

Enter no. of years :

12

Simple Interest : 8400.0

compound Interest : 12521.915889608248

4. Supply marks of three subject and declare the result, result declaration is based on below conditions:

- Condition 1: All subjects marks is greater than 60 is Passed

- Condition 2: Any two subjects marks are greater than 60 is Promoted

- Condition 3: Any one subject mark is greater than 60 or all subjects marks less than 60 is failed

java

//file name - ConditionClass.java

import java.util.Scanner;

public class ConditionClass {

public static void main(String[] args) {

//declaring variables

double sub1, sub2, sub3;

//declaring scanner object

Scanner scanner = new Scanner(System.in);

//user input

System.out.println("Enter marks in subject 1: ");

sub1 = scanner.nextDouble();

System.out.println("Enter marks in subject 2: ");

sub2 = scanner.nextDouble();

System.out.println("Enter marks in subject 3: ");

sub3 = scanner.nextDouble();

//conditions

if(sub1 > 60 && sub2 > 60 && sub3 > 60)

{

System.out.println("Passed");

}

else if((sub1 >60 && sub2 >60) || (sub2 >60 && sub3 >60) || (sub1 >60 && sub3 >60))

{

System.out.println("Promoted");

}

else

{

System.out.println("Failed");

}

}

}

Output:

Enter marks in subject 1:

90

Enter marks in subject 2:

70

Enter marks in subject 3:

23

Failed

5. Calculate the income tax on the basis of following table.

- Note:-Assume slab is consider for Male, Female as well as Senior citizen

| Slab | Income range | Tax Payable in percent |

|------|--------------|------------------------|

| Slab A | 0 - 1,80,000 | Nil |

| Slab B | 1,80,001 - 3,00,000 | 10% |

| Slab C | 3,00,001 - 5,00,000 | 20% |

| Slab D | 5,00,001 - 10,00,000 | 30% |

- Accept CTC from user and display tax amount

java

//file name - IncomeTax.java

import java.util.Scanner;

public class IncomeTax {

public static void main(String[] args) {

//declaring variables

double tax = 0, CTC;

//user input

Scanner scanner = new Scanner(System.in);

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

CTC = scanner.nextDouble();

//conditions

if(CTC <= 180000)

{

tax = 0;

}

else if(CTC > 180000 && CTC <= 300000)

{

//tax calculation

tax = (CTC/100)\*10;

System.out.println("Income tax payable is : " + tax);

}

else if(CTC > 300000 && CTC <= 500000)

{

//tax calculation

tax = (CTC/100)\*20;

System.out.println("Income tax payable is : " + tax);

}

else if(CTC > 500000 && CTC <= 1000000)

{

//tax calculation

tax = (CTC/100)\*30;

System.out.println("Income tax payable is : " + tax);

}

}

}

Output:

Enter income :

400000

Income tax payable is : 80000.0

6. Consider a CUI based application, where you are asking a user to enter his Login name and password, after entering the valid user-id and password it will print the message "Welcome" along with user name. As per the validation is concerned, the program should keep a track of login attempts. After three attempts a message should be flashed saying "Contact Admin" and the program should terminate.

java

//file name - LoginUser.java

import java.util.Scanner;

public class LoginUser {

public static void main(String[] args) {

//declaring variables

String name, password;

int count = 0, itr, track = 0;

//while loop for checking and exiting after attempts are complete or logged in successfully

while(count<3 && track == 0)

{

//user input

Scanner scanner = new Scanner(System.in);

System.out.println("Enter the login name : ");

name = scanner.nextLine();

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

password = scanner.nextLine();

//validation

if(name.equals("Renuka") && password.equals("Renu"))

{

//login success tracker

track = 1;

System.out.println("Welcome " + name);

}

else

{

//attempt count

count++;

itr = 3-count;

System.out.println("Try Again. Remaining attempts " + itr);

if(itr == 0)

{

System.out.println("Contact Admin");

}

}

}

}

}

Output:

Enter the login name :

Renuka

Enter password :

Renu

Try Again. Remaining attempts 2

Enter the login name :

Renuka

Enter password :

Renu

Welcome Renuka

7. There is an Array which is of the size 15, which may or may not be sorted. You should write a program to accept a number and search if it in contained in the array

- Example:

| Array Elements | 5 | 12 | 14 | 6 | 78 | 19 | 1 | 23 | 26 | 35 | 37 | 7 | 52 | 86 | 47 |

|----------------|---|----|----|---|----|----|---|----|----|----|----|---|----|----|----|

| Indexes | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

- Value to be search is 19

java

//file name - Array\_Search.java

import java.util.Arrays;

import java.util.Scanner;

public class Array\_Search {

public static void main(String[] args) {

//initialize array

int arr[] = {5,12,14,6,78,19,1,23,26,35,37,7,52,86,47};

//display array and user input

System.out.println(Arrays.toString(arr));

Scanner scanner = new Scanner(System.in);

System.out.println("Enter a number to search in array : ");

int n = scanner.nextInt();

//array search

for(int i = 0; i< arr.length; i++)

{

if(arr[i] == n)

{

System.out.println(n + " is found in the array at " + i + "th index.");

}

}

}

}

Output:

[5, 12, 14, 6, 78, 19, 1, 23, 26, 35, 37, 7, 52, 86, 47]

Enter a number to search in array :

19

19 is found in the array at 5th index.

8. Using the above table write method apply sorting using Bubble Sort

java

//file name - Bubble\_Sort.java

import java.util.Arrays;

public class Bubble\_Sort {

public static void main(String[] args) {

//initialize array

int arr[] = {5,12,14,6,78,19,1,23,26,35,37,7,52,86,47}, temp;

System.out.println(Arrays.toString(arr));

//bubble sort algorithm

for(int i = 0; i < arr.length-1; i++)

{

for(int j = 0; j < arr.length - i - 1; j++)

{

if(arr[j] > arr[j+1])

{

temp = arr[j];

arr[j] = arr[j+1];

arr[j+1] = temp;

}

}

}

//display

System.out.println("Sorted Array :");

System.out.println(Arrays.toString(arr));

}

}

Output:

[5, 12, 14, 6, 78, 19, 1, 23, 26, 35, 37, 7, 52, 86, 47]

Sorted Array :

[1, 5, 6, 7, 12, 14, 19, 23, 26, 35, 37, 47, 52, 78, 86]

9. Accept the marks of three students for the subject say A, B, C. Find the total scored and the average in all the subjects. Also Find the Total and Average scored by students in each respective Subject.

java

//file name - AvgMarks.java

import java.util.Scanner;

public class AvgMarks {

public static void main(String[] args) {

//declare and initialize variables

Scanner scanner = new Scanner(System.in);

double a[][] = new double[3][3];

double total = 0;

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

//user input array

for (int i=0;i<3;i++)

{

for (int j=0;j<3;j++)

{

a[i][j]=scanner.nextInt() ;

}

}

//add all marks

for (int i=0;i<3;i++)

{

for (int j=0;j<3;j++)

{

total += a[i][j];

}

}

//average all marks

System. out. println("Total marks in all subjects is: "+ total);

System. out. println("Average marks in all subjects is: "+ total/9) ;

total = 0;

//add individual marks

for (int i=0;i<3;i++)

{

total=0;

for (int j=0;j<3;j++)

{

total += a[i][j];

}

//average individual marks

System.out.println();

System. out. println("Total marks for student "+ (i+1) +" of each subject is: "+ total) ;

System. out. println("Average marks for student "+ (i+1) +" of each subject is: "+ total/3);

System.out.println();

total = 0;

}

}

}

Output:

Enter the marks

89

98

78

76

56

78

90

89

78

Total marks in all subjects is: 732.0

Average marks in all subjects is: 81.33333333333333

Total marks for student 1 of each subject is: 265.0

Average marks for student 1 of each subject is: 88.33333333333333

Total marks for student 2 of each subject is: 210.0

Average marks for student 2 of each subject is: 70.0

Total marks for student 3 of each subject is: 257.0