**Assignments on DataStructure**

1.Find out if the given number is an Armstrong number.

import java.util.Scanner;

import java.lang.Math;

public class Armstrong {

public static void main(String[] args) {

int num = 153, anum, rem;

int r = 0;

anum = num;

while (anum !=0)

{

rem = anum % 10;

r = r + rem\*rem\*rem;

}

if (r == num)

System.out.println(num + " is an Armstrong number ");

else

System.out.println(num + " is not an Armstrong number ");

}

}

Output:

153 is an Armstrong number

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

import java.util.Scanner;

import java.lang.Math;

public class Armstrong{

public static void main(String[] args) {

for(int n = 100; n < 10000; n++)

{

int t, rem, r = 0, i = 0;

t = n;

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

{

i++;

}

t = n;

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

{

rem = t % 10;

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

}

if(r == n)

{

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

}

}}}

Output:

153 is an ArmStrong number.

1634 is an ArmStrong number.

371 is an ArmStrong number.

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

;

public class simple {

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

int n=153;

System.out.print(n+" principle");

System.out.print("Enter rate of interest: ");

double r = input.nextDouble();

System.out.print("Enter t: ");

double t = input.nextDouble();

System.out.print("Enter number of times interest is compounded: ");

int num = input.nextInt();

double interest = (n \* t \* r) / 100;

double amt = n \*Math.pow(1 + (r /num), t \* num);

double compound = amt-n;

System.out.println("Principle amount: " + n);

System.out.println("Rate of Interest: " + r);

System.out.println("Time Duration: " + t);

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

System.out.println("Amount:"+ amt);

System.out.println("Compound" + compound);

input.close();

}

}

Output:

153 principle

Enter rate of interest: 2

Enter the time: 1

Enter number of times interest is compounded: 1

Principle amount: 153

Rate of Interest: 2.0

Time Duration: 1.0

Simple Interest: 3.06

Amount:450.0

compound: 329.0

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

Condition 1: All subjects marks are greater than 60 is Passed.

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

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

import java.util.Scanner;

public class Marks {

public static void main(String[] args) {

Scanner s= new Scanner(System.in);

System.out.println("Enter your 1st Subject Marks: ");

int m1 = s.nextInt();

System.out.println("Enter your 2nd Subject Marks: ");

int m2 = s.nextInt();

System.out.println("Enter your 3rd Subject Marks: ");

int m3 = s.nextInt();

if((m1>60)&&(m2>60)&&(m3>60))

{

System.out.println("Pass");

}

else if (((m1>60)&&(m2>60))||((m2>60)&&(m3>60))||((m1>60)&&(m3>60)))

{

System.out.println("Promoted");

}

else if ((m1<60)||(m2<60)||(m3<60))

{

System.out.println("Fail");

}

else

{

System.out.println("Error on values");

}

}

}

Output:

Enter your 1st Subject:

90

Enter your 2nd Subject:

89

Enter your 3rd Subject:

74

Promoted

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

Note: Assume slab is consider for Male, Female as well as Senior Citizen.

import java.util.Scanner;

public class TaxAmount {

public static void main(String[] args) {

int ctc;

double tax;

Scanner sc = new Scanner(System.in);

System.out.println("Enter the Annual salary ");

ctc = sc.nextInt();

if(ctc<=180000)

{

tax = 0;

System.out.println("Slab A's " + tax + " Tax Amount");

}

else if((ctc>=181001)&&(ctc<=300000))

{

tax = (ctc/100)\*10;

System.out.println("Slab B's " + tax + " Tax Amount");

}

else if((ctc>=300001)&&(ctc<=500000))

{

tax =(ctc/100)\*20;

System.out.println("Slab C's " + tax + " Tax Amount");

}

else if((ctc>=500001)&&(ctc<=1000000))

{

tax = (ctc/100)\*30;

System.out.println("Slab D's " + tax + " Tax Amount");

}

else

{

System.out.println("Wrong Input");

}

}

}

Output:

Enter the annual salary

500000

Slab C's 100000.0 Tax Amount

6. Consider a CUI based application, where you are asking a user to enter his Logic 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.

import java.util.Scanner;

public class Login {

public static void main(String[] args) {

String uname, pwd;

int cnt = 0, d;

while(cnt<3)

{

Scanner s = new Scanner(System.in);

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

uname = s.nextLine();

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

pwd = s.nextLine();

if(uname.equals("Dineshwari") && pwd.equals("dinesh"))

{

System.out.println("Welcome Dineshwari");

}

else

{

cnt++;

d = 3 – cnt;

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

If(d == 0)

{

System.out.println("Error!!! Contact your Administrator");

}}}

}

}

Output:

Enter login : Dineshwari

Enter password :

dinesh

Welcome Dineshwari

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.

import java.util.Scanner;

public class Linear{

public static void main(String[] args) {

int i,n,s,arr[];

Scanner s= new Scanner(System.in);

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

n = s.nextInt();

arr = new int[n];

System.out.println("Enter the " + n + " elements");

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

{

arr[i]=s.nextInt();

}

System.out.println("Enter search amount");

s = s.nextInt();

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

{

if(arr[i]==s)

{

System.out.println(s + " is present");

break;

}

}

if(i==n)

System.out.println(s + " is not present");

}

}

Output:

Enter number of elements

5

Enter the 5 elements

5 12 4 33 2

Enter search amount: 12

12 is present

Enter number of elements

5

Enter the 5 elements

4 22 13 5 2

Enter search amount: 12

12 is not present

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

public class BubbleSort {

static void bubblesort(int[]arr) {

int n = arr.length;

int t= 0;

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

{

for(int j = 1; j<(n-i); j++)

{

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

{

t= arr[j-1];

arr[j-1] = arr[j];

arr[j]=t;

}

}

}

}

public static void main(String[] args) {

int arr[]= {3,44,23,54,22,12,5};

System.out.println(Before Bubble Sort");

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

{

System.out.println(arr[i] + " ");

}

System.out.println();

bubblesort(arr);

System.out.println("After Bubble Sort");

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

System.out.println(arr[i] + " ");

}

}

}

Output:

Before Bubble Sort

3 44 23 54 22 12 5

After Bubble Sort

3 5 12 22 23 44 54

9.Accept the marks of three students for the subject A,B,C. Find the total scored and the average in all the subjects.

Also Find theTotal and Average scored by students in each respective Subject.

import java.util.Scanner;

public class Average {

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

int a[][] = new int[3][3];

int i, j;

int t = 0;

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

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

{

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

{

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

}

}

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

{

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

{

t=t+a[i][j];

}}

System. out. println("Total marks: "+ t);

System. out. println("Average marks: "+ t/9) ;

t = 0;

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

{

t=0;

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

{

t=t+a[i][j];

}

System. out. println("Total marks for each student is: "+ t) ;

System. out. println("Average marks for each student is: "+ t/3);

t = 0;

}

}

}

Output:

Enter marks : 56 45 79 45 90 88 85 60 75

Total marks : 623

Average marks: 70

Total marks for each student is: 167

Average marks for each student is: 56

Total marks for each student is: 159

Average marks for each student is: 53

Total marks for each student is: 125

Average marks for each student is: 41