CORE JAVA

BASIC DATA STRUCTURE ASSIGNMENT

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

Code:-

Armstrong.java - Notepad

File Edit Format View Help

```
import java.util.*;
public class Armstrong
{
public static void main(String[] args)
{
int n,rev=0,num,rem;
Scanner sc=new Scanner(System.in);
System.out.print("Enter number:");
n=sc.nextInt();
num=n;
while(num>0)
{
rem=num%10;
rev=rev+(rem*rem*rem);
num=num/10;
}
if(rev==n)
{
System.out.println("It is an Armstrong number.");
}
else
{
System.out.println("It is not an Armstrong number.");
}
}
}
```

Output :-

C:\Windows\System32\cmd.exe

```
Microsoft Windows [Version 10.0.19042.1288]
(c) Microsoft Corporation. All rights reserved.

C:\Users\MBALKRIS\Desktop\Java code>javac Armstrong.java

C:\Users\MBALKRIS\Desktop\Java code>java Armstrong
Enter number:153
It is an Armstrong number.

C:\Users\MBALKRIS\Desktop\Java code>java Armstrong
Enter number:111
It is not an Armstrong number.

C:\Users\MBALKRIS\Desktop\Java code>
```

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

Code:-

```
1  import java.util.*;
2  public class Armstrong
3  {
4  public static void main(String[] args)
5  {
6  System.out.print("Armstrong numbers from 100 to 999 are:");
7  for(int i=100;i<1000;i++)
8  {
9  int n=i,rev=0,rem=0;
10 while(n>0)
11 {
12 rem=n%10;
13 rev=rev+(rem*rem*rem);
14 n=n/10;
15 }
16 if(rev==i)
17 {
18 System.out.print(i+" ");
19 }
20 }
21 }
22 }
```

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```
<terminated> Armstrong [Java Application] C:\Users\MBALKRIS\.p2\pool\plugins\org.eclips
Armstrong numbers from 100 to 999 are:153 370 371 407
```

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

Code:-

```
1  import java.util.*;
2  public class Interest
3  {
4  public static void main(String[] args)
5  {
6  Scanner input = new Scanner(System.in);
7  System.out.print("Enter the principal:Rs.");
8  double principal = input.nextDouble();
9  System.out.print("Enter the rate: ");
10 double rate = input.nextDouble();
11 System.out.print("Enter the period: ");
12 double period = input.nextDouble();
13 double simpleinterest = (principal * period * rate) / 100;
14 double compoundinterest=principal * Math.pow(1.0+rate/100.0,period) - principal;
15 System.out.println(" ");
16 System.out.println("Principal:Rs. " + principal);
17 System.out.println("Interest Rate: " + rate +" p.a");
18 System.out.println("Time Duration: " + period +" yrs");
19 System.out.println(" ");
20 System.out.println("Simple Interest:Rs." + simpleinterest);
21 System.out.println("Simple Interest:Rs." + compoundinterest);
22 }
23 }
```

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```
<terminated> Interest [Java Application] C:\Users\MBALKRIS\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win3
Enter the principal:Rs.20000
Enter the rate: 8
Enter the period: 5

Principal:Rs. 20000.0
Interest Rate: 8.0 p.a
Time Duration: 5.0 yrs

Simple Interest:Rs.8000.0
Simple Interest:Rs.9386.561536000012
```

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

Condition 1 :- All subject marks is greater than 60 is passed.

Condition 2 :- Any two subject 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.

Code:-

```
import java.util.*;
class Result
{
public static void main(String args[])
{
int sub1,sub2,sub3;
Scanner sc=new Scanner(System.in);
System.out.print("Enter marks for subject 1:");
sub1=sc.nextInt();
System.out.print("Enter marks for subject 2:");
sub2=sc.nextInt();
System.out.print("Enter marks for subject 3:");
sub3=sc.nextInt();

if (sub1 < 0 || sub1 > 100)
     System.out.println("Result:Invalid Marks");
else if (sub2 < 0 || sub2 > 100)
     System.out.println("Result:Invalid Marks");
else if (sub3 < 0 || sub3 > 100)
     System.out.println("Result:Invalid Marks");
else if ( (sub1 > 60) & (sub2 > 60) & ( sub3 > 60))
     System.out.println("Result:Passed");
else if ( (sub1 < 60) & (sub2 > 60) & ( sub3 > 60))
     System.out.println("Result:Promoted");
else if ( (sub1 > 60) & (sub2 < 60) & ( sub3 > 60))
     System.out.println("Result:Promoted");
else if ( (sub1 > 60) & (sub2 > 60) & ( sub3 < 60))
     System.out.println("Result:Promoted");
```

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```
<terminated> Result [Java Application] C:\Users\MBALKRIS\.p2\pool\plugins\org.ec
Enter marks for subject 1:70
Enter marks for subject 2:65
Enter marks for subject 3:90
Result:Passed
```

```
sub2=sc.nextInt();
System.out.print("Enter marks for subject 3:");
sub3=sc.nextInt();

if (sub1 < 0 || sub1 > 100)
     System.out.println("Result:Invalid Marks");
else if (sub2 < 0 || sub2 > 100)
     System.out.println("Result:Invalid Marks");
else if (sub3 < 0 || sub3 > 100)
     System.out.println("Result:Invalid Marks");
else if ( (sub1 > 60) & (sub2 > 60) & ( sub3 > 60))
     System.out.println("Result:Passed");
else if ( (sub1 < 60) & (sub2 > 60) & ( sub3 > 60))
     System.out.println("Result:Promoted");
else if ( (sub1 > 60) & (sub2 < 60) & ( sub3 > 60))
     System.out.println("Result:Promoted");
else if ( (sub1 > 60) & (sub2 > 60) & ( sub3 < 60))
     System.out.println("Result:Promoted");
else if ( (sub1 > 60) & (sub2 < 60) & ( sub3 < 60))
     System.out.println("Result:Failed");
else if ( (sub1 < 60) & (sub2 > 60) & ( sub3 < 60))
     System.out.println("Result:Failed");
else if ( (sub1 < 60) & (sub2 < 60) & ( sub3 > 60))
     System.out.println("Result:Failed");
else
     System.out.println("Result:Failed");
}
}
```

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```
<terminated> Result [Java Application] C:\Users\MBALKRIS\.p2\pool\plugins\org.eclipse.justj.ope
Enter marks for subject 1:40
Enter marks for subject 2:70
Enter marks for subject 3:80
Result:Promoted
```

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```
<terminated> Result [Java Application] C:\Us
Enter marks for subject 1:20
Enter marks for subject 2:30
Enter marks for subject 3:70
Result:Failed
```

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```
<terminated> Result [Java Application] C:\Users
Enter marks for subject 1:10
Enter marks for subject 2:30
Enter marks for subject 3:25
Result:Failed
```

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

Slab	Income Range	Tax payable in Percentage
Slab A	0-1,80,000	Nil
Slab B	1,81,001-3,00,000	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.

Code:-

```
1  import java.util.*;
2  class Tax
3  {
4  public static void main(String args[])
5  {
6  double income,tax=0;
7  Scanner sc=new Scanner(System.in);
8  System.out.print("Enter CTC:Rs.");
9  income=sc.nextDouble();
10 if(income<=180000)
11 {
12 System.out.println("No Tax");
13 }
14 else if(income<=300000)
15 {
16 tax=income*0.10;
17 System.out.println("Tax:Rs."+tax);
18 }
19 else if(income<=500000)
20 {
21 tax=income*0.20;
22 System.out.println("Tax:Rs."+tax);
23 }
24 else if(income<=1000000)
25 {
26 tax=income*0.30;
27 System.out.println("Tax:Rs."+tax);
28 }
```

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<terminated> Tax [Java Application] C:\Users\MBALKRIS\.p2\pc

```
Enter CTC:Rs.10000
No Tax
```

```
tax=income*0.30;
System.out.println("Tax:Rs."+tax);
}
else
{
System.out.println("Enter valid CTC");
}
}
}
```

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<terminated> Tax [Java Application] C:\Users\MBALKRIS\.p2\poo

Enter CTC:Rs.350000

Tax:Rs.70000.0

Problems Javadoc Declaration

<terminated> Tax [Java Application] C:\Use

Enter CTC:Rs.200000

Tax:Rs.20000.0

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 username. 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.

Code:-

```
import java.util.*;
public class Login
{
public static void main(String[] args)
{
int attempt=3,temp=attempt;
Scanner sc = new Scanner(System.in);
String uname="Mrunal";
String pass="Mrunal@22";
for(int i=1;i<=temp;i++)
{
System.out.println("Enter the Username:");
String lname = sc.nextLine();
System.out.println("Enter the Password:");
String upass = sc.nextLine();
if(uname.equals(lname) && pass.equals(upass))
{
    System.out.println("Welcome "+lname);
    break;
}
else
{
System.out.println("Login failed");
attempt--;
System.out.println("Total attempts left:"+attempt);
}
if(attempt==0)
{
```

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<terminated> Login [Java Application] C:\Users\MBALKRIS\.p2\pool\plugins\org.eclipse.justj.ope

Enter the Username:

Mrunal

Enter the Password:

Mrunal@22

Welcome Mrunal

```
import java.util.*;
public class Login
{
public static void main(String[] args)
{
int attempt=3,temp=attempt;
Scanner sc = new Scanner(System.in);
String uname="Mrunal";
String pass="Mrunal@22";
for(int i=1;i<=temp;i++)
{
System.out.println("Enter the Username:");
String lname = sc.nextLine();
```

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<terminated> Login [Java Application] C:\Users\MBALKRIS\.p2\pool\plugins\org.ec

Enter the Username:

Mrunal

Enter the Password:

Mru

Login failed

Total attempts left:2

Enter the Username:

Mrunal

Enter the Password:

mru

Login failed

Total attempts left:1

Enter the Username:

Mrunal

Enter the Password:

22

Login failed

Total attempts left:0

Contact Admin

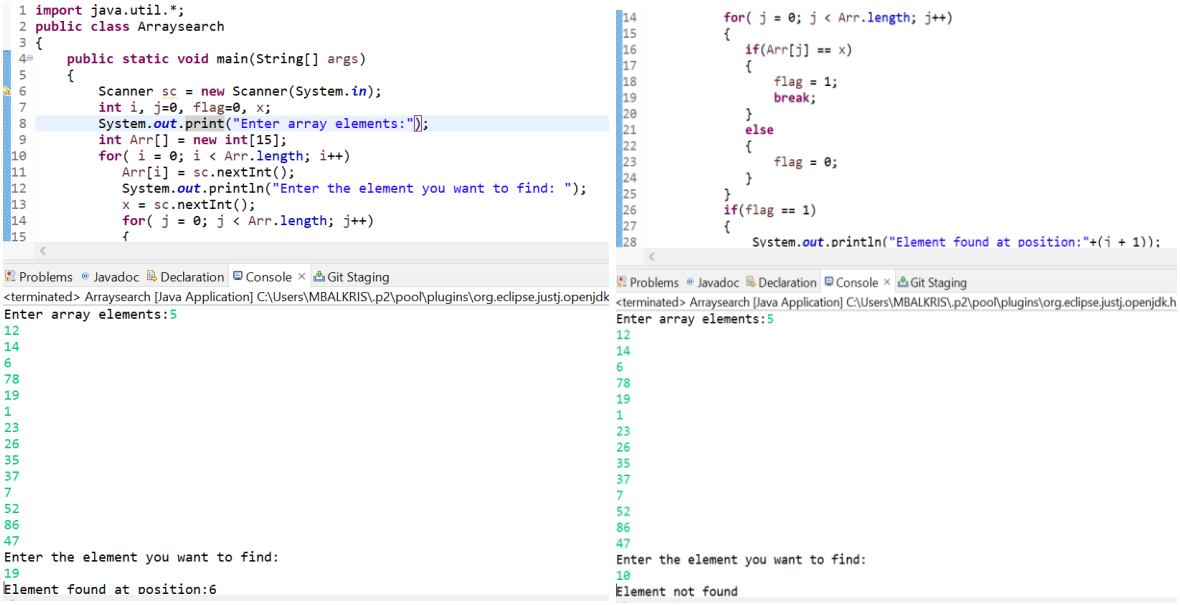
7.There is an array which is of size 15, which may or may not be sorted. You should write a program to accept a number and search if it is contained in the array.

Example:

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

Value to be search is 19

Code:-



```
import java.util.*;
public class Arraysearch
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        int i, j=0, flag=0, x;
        System.out.print("Enter array elements:");
        int Arr[] = new int[15];
        for( i = 0; i < Arr.length; i++)
           Arr[i] = sc.nextInt();
           System.out.println("Enter the element you want to find: ");
           x = sc.nextInt();
           for( j = 0; j < Arr.length; j++)
           {
              if(Arr[j] == x)
              {
                  flag = 1;
                  break;
              }
              else
              {
                  flag = 0;
              }
           }
           if(flag == 1)
           {
               System.out.println("Element found at position:"+(j + 1));
           }
           else
           {
               System.out.println("Element not found");
           }
    }
}
```

```
Enter array elements:5
12
14
6
78
19
1
23
26
35
37
7
52
86
47
Enter the element you want to find:
19
Element found at position:6
```

```
Enter array elements:5
12
14
6
78
19
1
23
26
35
37
7
52
86
47
Enter the element you want to find:
10
Element not found
```

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

Code:-

```
class Bubblesort
{
void bubbleSort(int arr[])
{
int n = arr.length;
for (int i = 0; i < n-1; i++)
{
for (int j = 0; j < n-i-1; j++)
{
if (arr[j] > arr[j+1])
{
int temp = arr[j];
arr[j] = arr[j+1];
arr[j+1] = temp;
}
}
}
}
void printArray(int arr[])
{
int n = arr.length;
for (int i=0; i<n; ++i)
System.out.print(arr[i] + " ");
System.out.println();
}
public static void main(String args[])
{
Bubblesort b = new Bubblesort();
int arr[] = {5,12,14,6,78,19,1,23,26,35,37,7,52,86,47};
System.out.println("Array before sorting:");
b.printArray(arr);
b.bubbleSort(arr);
System.out.println("Array after sorting:");
b.printArray(arr);
}
}
```

```
Array before sorting:
5 12 14 6 78 19 1 23 26 35 37 7 52 86 47
Array after sorting:
1 5 6 7 12 14 19 23 26 35 37 47 52 78 86
```

9. Accept the marks of three students for the subjects 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.

Code:-

```java
import java.util.*;
public class Totalavg
{
public static void main(String[] args)
{
    int s1e,s1m,s1s,s2e,s2m,s2s,s3e,s3m,s3s;

    System.out.println("Enter the marks scored by Student 1:");
    System.out.println("Marks obtained in English:");
    Scanner sc=new Scanner(System.in);
    s1e=sc.nextInt();
    System.out.println("Marks obtained in Maths:");
    s1m=sc.nextInt();
    System.out.println("Marks obtained in Science:");
    s1s=sc.nextInt();
    int s1total=s1e+s1m+s1s;
    int s1avg=s1total/3;
    System.out.println("Total marks obtained by Student 1:"+s1total);
    System.out.println("Average marks obtained by Student 1:"+s1avg);
    System.out.println("----------------------------------");

    System.out.println("Enter the marks scored by Student 2:");
    System.out.println("Marks obtained in English:");
    s2e=sc.nextInt();
    System.out.println("Marks obtained in Maths:");
    s2m=sc.nextInt();
    System.out.println("Marks obtained in Science:");
    s2s=sc.nextInt();
    int s2total=s2e+s2m+s2s;
    int s2avg=s2total/3;
    System.out.println("Total marks obtained by Student 2:"+s2total);
    System.out.println("Average marks obtained by Student 2:"+s2avg);
    System.out.println("----------------------------------");

    System.out.println("Enter the marks scored by Student 3:");
    System.out.println("Marks obtained in English:");
    s3e=sc.nextInt();
    System.out.println("Marks obtained in Maths:");
    s3m=sc.nextInt();
    System.out.println("Marks obtained in Science:");
    s3s=sc.nextInt();
    int s3total=s3e+s3m+s3s;
    int s3avg=s3total/3;
    System.out.println("Total marks obtained by Student 3:"+s3total);
    System.out.println("Average marks obtained by Student 3:"+s3avg);
    System.out.println("----------------------------------");

    int e=s1e+s2e+s3e;
    int eavg=e/3;
    System.out.println("Total marks obtained by 3 students in English:"+e);
    System.out.println("Average marks obtained by 3 students in English:"+eavg);

    int m=s1m+s2m+s3m;
    int mavg=m/3;
    System.out.println("Total marks obtained by 3 students in Maths:"+m);
    System.out.println("Average marks obtained by 3 students in Maths:"+mavg);

    int s=s1s+s2s+s3s;
    int savg=s/3;
    System.out.println("Total marks obtained by 3 students in Science:"+s);
    System.out.println("Average marks obtained by 3 students in Science:"+savg);
}
}
```

```
<terminated> Totalavg [Java Application] C:\Users\MBALKRIS\.p2\pool\
Enter the marks scored by Student 1:
Marks obtained in English:
20
Marks obtained in Maths:
10
Marks obtained in Science:
30
Total marks obtained by Student 1:60
Average marks obtained by Student 1:20
----------------------------------
Enter the marks scored by Student 2:
Marks obtained in English:
50
Marks obtained in Maths:
40
Marks obtained in Science:
20
Total marks obtained by Student 2:110
Average marks obtained by Student 2:36
----------------------------------
Enter the marks scored by Student 3:
Marks obtained in English:
30
Marks obtained in Maths:
40
Marks obtained in Science:
50
Total marks obtained by Student 3:120
Average marks obtained by Student 3:40
----------------------------------
----------------------------------
Total marks obtained by 3 students in English:100
Average marks obtained by 3 students in English:33
Total marks obtained by 3 students in Maths:90
Average marks obtained by 3 students in Maths:30
Total marks obtained by 3 students in Science:100
Average marks obtained by 3 students in Science:33
```