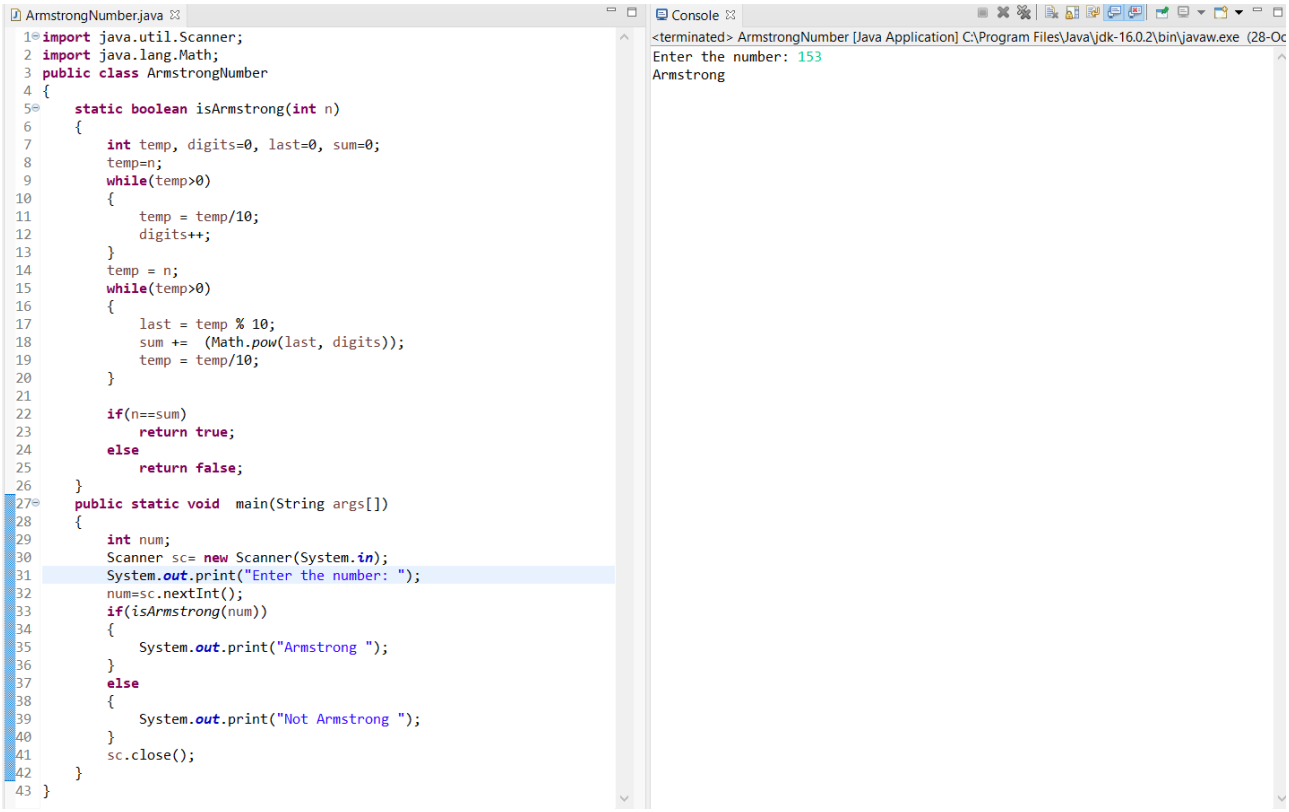
Core Java Assignment 1

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

Logic: - if 153 is the Supplied value, then 18 + 5 + 38 = 1+125+27 = 153 .This is the same as supplied value hence it is an Armstrong number.



ArmstrongNumber.java

```
import java.util.Scanner;
import java.lang.Math;
public class ArmstrongNumber
{
    static boolean isArmstrong(int n)
    {
        int temp, digits=0, last=0, sum=0;
        temp=n;
        while(temp>0)
        {
            temp = temp/10;
            digits++;
        }
        temp = n;
        while(temp>0)
        {
            last = temp % 10;
            sum +=  (Math.pow(last, digits));
            temp = temp/10;
        }

        if(n==sum)
            return true;
        else
            return false;
    }
    public static void  main(String args[])
    {
        int num;
        Scanner sc= new Scanner(System.in);
        System.out.print("Enter the number: ");
        num=sc.nextInt();
        if(isArmstrong(num))
        {
            System.out.print("Armstrong ");
        }
        else
        {
            System.out.print("Not Armstrong ");
        }
        sc.close();
    }
}
```

Console

```
<terminated> ArmstrongNumber [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.exe  (28-Oc
Enter the number: 153
Armstrong
```

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

```
import java.util.Scanner;
import java.lang.Math;
public class ArmstrongNumberRange
{
    static boolean isArmstrong(int n)
    {
        int temp, digits=0, last=0, sum=0;
        temp=n;
        while(temp>0)
        {
            temp = temp/10;
            digits++;
        }
        temp = n;
        while(temp>0)
        {
            last = temp % 10;
            sum +=  (Math.pow(last, digits));
            temp = temp/10;
        }
        if(n==sum)
            return true;
        else
            return false;
    }
    public static void main(String args[])
    {
    int num1,num2;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the starting limit: ");
    num1=sc.nextInt();
    System.out.println("Enter the ending limit: ");
    num2=sc.nextInt();
    System.out.println("Armstrong Number from "+ num1 + " to " +num2 +"
    for(int i=num1; i<=num2; i++)
    if(isArmstrong(i))
    System.out.print(i+ " ");
    sc.close();
    }
    }

```

```
<terminated> ArmstrongNumberRange [Java Applica
Enter the starting limit:
100
Enter the ending limit:
999
Armstrong Number from 100 to 999 are:
153 370 371 407
```

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

ArmstrongNumber.java | ArmstrongNumberRange.java | SiCi.java

```
1  import java.util .*;
2  class SiCi
3  {
4      public static void main (String argu[ ])
5  {
6      double pr, rate, t, sim,com;
7      Scanner sc=new Scanner (System. in);
8      System.out.println("Enter the amount:");
9      pr=sc.nextDouble();
10     System. out. println("Enter the No.of years:");
11     t=sc.nextDouble();
12     System. out. println("Enter the Rate of  interest");
13     rate=sc.nextDouble();
14     sim=(pr * t * rate)/100;
15     com=pr * Math.pow(1.0+rate/100.0,t) - pr;
16     System.out.println("Simple Interest="+sim);
17     System.out. println("Compound Interest="+com);
18     sc.close();
19     }
20 }
21
```

Console

```
<terminated> SiCi [Java Application] C:\Program Fil
Enter the amount:
10000
Enter the No.of years:
3
Enter the Rate of  interest
2.5
Simple Interest=750.0
Compound Interest=768.9062499999964
```

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.

ArmstrongNumber.j... | ArmstrongNumberR... | SiCi.java | StudentResult.java

```
1  import java.util.*;
2  public class StudentResult
3  {
4      public static void main(String[] args)
5      {
6          int sub1;
7          int sub2;
8          int sub3;
9          Scanner sc=new Scanner(System.in);
10         System.out.println("Enter the first subject marks:");
11         sub1=sc.nextInt();
12         System.out.println("Enter the second subject marks:");
13         sub2=sc.nextInt();
14         System.out.println("Enter the third subject marks:");
15         sub3=sc.nextInt();
16         if(sub1>60 && sub2>60 && sub3>60)
17         {
18             System.out.println("Student is Passed");
19         }
20         else
21             if(sub1>60&&sub2>60||sub2>60&&sub3>60||sub1>60&&sub3>60)
22             {
23                 System.out.println("Student is Promoted");
24             }
25             else
26                 if((sub1<60&&sub2<60&&sub3<60)||(sub1>60&&sub2<60||sub3
27                 {
28                     System.out.println("Student is Failed");
29                 }
30         sc.close();
31     }
32
33 }
34
```

Console

```
<terminated> StudentResult [Java Application] C:\Program Files\Java\jc
Enter the first subject marks:
80
Enter the second subject marks:
50
Enter the third subject marks:
50
Student is 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

SiCi.java | IncomeTax.java

```java
import java.util.*;
public class IncomeTax {

    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        double amt=0;
        double tax_amt=0;
        System.out.println("Enter the CTC or Income:");
        amt=sc.nextDouble();
        if(amt<=180000)
        {
            System.out.println("Tax to be paid is: NIL");
        }
        else
            if(amt>181000&& amt<=300000)
            {
                tax_amt=tax_amt+amt*10/100;
            }
            else
                if(amt>300000&& amt<=500000)
                {
                    tax_amt=tax_amt+amt*20/100;
                }
                else
                    if(amt>500000&& amt<=1000000)
                    {
                        tax_amt=tax_amt+amt*30/100;
                    }
        System.out.println("The Tax Amount to be paid is:"+tax_amt);
        sc.close();

    }

}
```

Console

```
<terminated> IncomeTax [Java Application] C:\Program Files\Java\jc
Enter the CTC or Income:
1000000
The Tax Amount to be paid is:300000.0
```

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.

Login_Page.java

```java
import java.util.Scanner;
public class Login_Page {
    static int count=0;
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String sp=" ";
        System.out.println("Enter the Username");
        String uname = sc.nextLine();
        if((uname.contains(sp)) || uname.length()<4){
            System.out.println("Invalid Username");
            return;
        }

        System.out.println("Enter the Password");
        String upass = sc.nextLine();
        if((upass.contains(sp)) || upass.length()<8){
            System.out.println("Invalid Password");
            return;
        }

        System.out.println(uname+" you are Registered Successfully");
        for(int i=0;i<3;++i)
        {
                System.out.println("Enter the Username");
                String lname = sc.nextLine();
                System.out.println("Enter the Password");
                String lpass = sc.nextLine();
                if(uname.equals(lname) && upass.equals(lpass))
                {
                    System.out.println("Welcome "+lname+" you have Logged-in Succes
                }
                else
                {
                    System.out.println("Username or password Mismatch");
                    count++;
                }
         }
        if(count>=3)
                {
                    System.out.println("Contact Admin");
                }
                sc.close();
    }
```

Console

```
<terminated> Login_Page [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.ex
Enter the Username
chandan
Enter the Password
123456789
chandan you are Registered Successfully
Enter the Username
chandan
Enter the Password
12456789
Username or password Mismatch
Enter the Username
chandan
Enter the Password
123478956
Username or password Mismatch
Enter the Username
chandan
Enter the Password
1234578922
Username or password Mismatch
Contact Admin
```

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

SiCi.java | IncomeTax.java | Arrays.java

```
1  import java.util.*;
2  public class Arrays
3  {
4      public static void main(String[] args)
5      {
6          int arr[]= {5,12,14,6,78,19,1,23,26,35,37,7,52,86,47};
7          int num=0;
8          boolean found=false;
9          Scanner sc=new Scanner(System.in);
10         System.out.println("Enter the number to be searched:");
11         num=sc.nextInt();
12         for(int i=0;i<arr.length-1;++i)
13         {
14             if(num==arr[i])
15             {
16                 found=true;
17             }
18         }
19         if(found)
20         {
21             System.out.println("The Number is found..!!!");
22         }
23         else
24         {
25             System.out.println("The Number is Not Found :(");
26         }
27         sc.close();
28     }
29
30 }
31
```

Console

```
<terminated> Arrays [Java Application] C:\Program File
Enter the number to be searched:
88
The Number is Not Found :(
```

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

SiCi.java | IncomeTax.java | *Arrays.java

```
10         /*
11          * System.out.println("Enter the number to be searched:");
12         num=sc.nextInt();
13         for(int i=0;i<arr.length-1;++i)
14         {
15             if(num==arr[i])
16             {
17                 found=true;
18             }
19         }
20         if(found)
21         {
22             System.out.println("The Number is found..!!!");
23         }
24         else
25         {
26             System.out.println("The Number is Not Found :(");
27         }
28         */
29         int temp=0;
30         for(int j=0;j<arr.length-1;++j)
31         {
32             for(int k=0;k<arr.length-2;++k)
33             {
34             if(arr[k]>arr[k+1])
35             {
36                 temp=arr[k];
37                 arr[k]=arr[k+1];
38                 arr[k+1]=temp;
39             }
40             }
41
42         }
43         System.out.println("After Sorting");
44         for(int i=0;i<arr.length-1;++i)
45         {
46             System.out.println(arr[i]);
47         }
48         sc.close();
49     }
50
51 }
```

Console

```
<terminated> Arrays [Java Applica
After Sorting
1
5
6
7
12
14
19
23
26
35
37
52
78
86
```