1) Find out if the given number is an *Armstrong number*.
Logic: - if **153** is the Supplied value, then $1^3 + 5^3 + 3^3 = 1+125+27 = 153$
This is the same as supplied value hence it is an Armstrong number.

Armstrong.java

```java
package Assignment.java;

public class Armstrong {

    public static void main(String[] args) {
        int n = 153;
        int temp = n;
        int r,sum=0;

        while(n>0)
        {
            r = n%10;
            n = n/10;
            sum = sum + r*r*r;// TODO Auto-generated method stub
        }

        if(temp == sum)
            System.out.println("Its an Armstrong number");
        else
            System.out.println("Not an Armstrong number");

    }

}

```

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

Armstrong.java | ArmstrongRange.java

```java
package Assignment.java;

public class ArmstrongRange {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
      int digit1,digit2,digit3,result,temp;
      for(int number = 100; number <= 999; number++)
      {
          temp = number;
          digit3=temp%10;
          temp=temp/10;

          digit2=temp%10;
          temp=temp/10;

          digit1=temp%10;
          result=(digit1 * digit1 * digit1)+( digit2 * digit2 * digit2)+(digit3 *

          if(number==result) {
              System.out.println(number + " is armstrong Number");
          }
      }
    }

}
```

Problems | Javadoc | Declaration | Console

<terminated> ArmstrongRange [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.wir

```
153 is armstrong Number
370 is armstrong Number
371 is armstrong Number
407 is armstrong Number
```

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

```java
package Assignment.java;
import java.util.Scanner;
public class Compoundinterest {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
     Scanner input = new Scanner(System.in);

     System.out.println("Enter the principal: ");
     double principal = input.nextDouble();

     System.out.println("Enter the rate: ");
     double rate = input.nextDouble();

     System.out.println("Enter the time: ");
     double time = input.nextDouble();

     System.out.println("Enter number of times interest is compounded: ");
     int number = input.nextInt();

     double interest = principal + (Math.pow((1 + rate/100),(time * number))) - p

     System.out.println("Principal: " + principal);
     System.out.println("Interest Rate: " + rate);
     System.out.println("Time Duration: " + time);
     System.out.println("Number of the interest Compounded: " + number);
```

```java

     System.out.println("Enter the time: ");
     double time = input.nextDouble();

     System.out.println("Enter number of times interest is compounded: ");
     int number = input.nextInt();

     double interest = principal + (Math.pow((1 + rate/100),(time * number))) - p

     System.out.println("Principal: " + principal);
     System.out.println("Interest Rate: " + rate);
     System.out.println("Time Duration: " + time);
     System.out.println("Number of the interest Compounded: " + number);
     System.out.println("Compound Interest: " + interest);

     input.close();
    }
}
```

Problems Javadoc Declaration Console ×

<terminated> Compoundinterest [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32

```
Enter the principal:
1000
Enter the rate:
10
Enter the time:
3
```

```
Enter the time:
3
Enter number of times interest is compounded:
1
Principal: 1000.0
Interest Rate: 10.0
Time Duration: 3.0
Number of the interest Compounded: 1
Compound Interest: 1.3310000000000173
```

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.

Armstrong.java | ArmstrongRange.java | Compoundinterest.java | *Subjects.java ×

```java
package Assignment.java;
import java.util.Scanner;
public class Subjects {
    public String declareResults(double subj1,double subj2,double subj3) {
        double sum = subj1+subj2+subj3;
        if((sum<60 || (subj1>60 && subj2<60 && subj3 <60))||(sum<60 || (subj2>60
        return "failed";
        }
        else if(sum>60 && ((subj1+subj2<=60) && (subj2+subj3<=60)&& subj1+subj3<=
            return "Passed";
        else
            return "passed\npromoted";
    }
    public static void main(String[] args) {
        double subj1,subj2,subj3;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the marks of subject1: ");
        subj1=sc.nextDouble();
        System.out.println("Enter the marks of subject2: ");
        subj2=sc.nextDouble();
        System.out.println("Enter the marks of subject3: ");
        subj3=sc.nextDouble();
        Subjects resultDeclaration = new Subjects();
        System.out.println(resultDeclaration.declareResults(subj1,subj2,subj3));
    }

}
```

```
<terminated> Subjects [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.ju
Enter the marks of subject1:
78
Enter the marks of subject2:
67
Enter the marks of subject3:
56
passed
promoted
```

Condition 3: Any one subject mark is greater than 80 or all subjects marks less than 60 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	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

```java
package Assignment.java;
import java.util.Scanner;
public class TaxAmount {
    double tax=0;
    public double calculateTaxAmount(int ctc) {
        if(ctc>0 && ctc<=180000) {
            tax=0;
        }
        else if(ctc >= 180001 && ctc <= 300000) {
            tax =(ctc*10)/100;
        }
        else if(ctc>=3000001 && ctc<=500000) {
            tax=(ctc*20)/100;
        }
        else if(ctc>=500001 && ctc <= 1000000)
            tax=(ctc*30)/100;
        return tax;
    }
        public static void main(String[] args) {
            Scanner sc = new Scanner(System.in);
            int ctc;
            System.out.println("Enter your CTC: ");
            ctc=sc.nextInt();
            TaxAmount taxAmount = new TaxAmount();
            double tax;
            tax=taxAmount.calculateTaxAmount(ctc);
            System.out.println("Tax payable : "+tax);

    }}
```

Problems Javadoc Declaration Console ×

<terminated> TaxAmount [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.justj.o

```
100000
Tax payable : 0.0
```

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

```java
package Assignment.java;

class Bubblesort {

    public int[] bubbleSort(int arr[]) {

        for(int i=0;i<arr.length-1;i++){
            for(int j=0;j<arr.length-1-i;j++){
                if(arr[j]>arr[j+1]){

                    int temp = arr[j];
                    arr[j]= arr[j+1];
                    arr[j+1]=temp;
                }
            }
        }
        return arr;
    }
      public static void main(String args[]) {
          int arr[] = {5,12,14,6,78,19,1,23,26,35,37,7,52,86,47};
          Bubblesort bubbleSort = new Bubblesort();
          int sortedArray[] =bubbleSort.bubbleSort(arr);
          for(int i:sortedArray){
              System.out.print(i+" ");
          }
    }
}
```

Problems Javadoc Declaration Console ×

<terminated> Bubblesort [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspo

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

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:

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

Value to be search is 19

```java
package Assignment.java;

public class SearchArray {
      public boolean searchArray(int[] arr,int toCheckValue){
          boolean valueFound=false;
          for(int i=0;i<arr.length;i++){
              if(arr[i]==toCheckValue)
                  valueFound=true;
          }
          return valueFound;
      }

   public static void main(String[] args) {
       int arr[] = {5,12,14,6,78,19,1,23,26,35,37,7,52,86,47};
       int valueToCheck = 19;
       SearchArray searchArray = new SearchArray();
       if (searchArray.searchArray(arr,  valueToCheck)) {
           System.out.println("element is not present in the array");
       }
   }
}

```

Problems Javadoc Declaration Console ×

<terminated> SearchArray [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.j

```
element is not present in the array
```

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
package Assignment.java;
import java.util.Scanner;
public class Login {
    String userId = "Ajay",password="password";
    int loginAttempt=3;
    public String loginUser(String user, String pass) {
        if(user.equals(userId)&& pass.equals(password)) {
            return "yes";
        }
        else {
            return "no";
        }}
    public static void main(String[] args) {
        Login login = new Login();
        String userId,password;
        Scanner sc = new Scanner(System.in);
        int loginAttempt =0;
        while(true) {
            System.out.println("Enter userId");
            userId = sc.next();
            System.out.println("Enter password");
            password=sc.next();
            String res = login.loginUser(userId, password);
            if(res.equals("yes")){
                System.out.println("You have entered wrong credential 3 times");
                System.out.println("Contact Admin");
                break;}
            System.out.println("You have entered wrong credentials ,Please enter
}}}
```

Problems Javadoc Declaration Console ×

<terminated> Login [Java Application] C:\Users\valaanus\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_1

```
You have entered wrong credential 3 times
Contact Admin
```