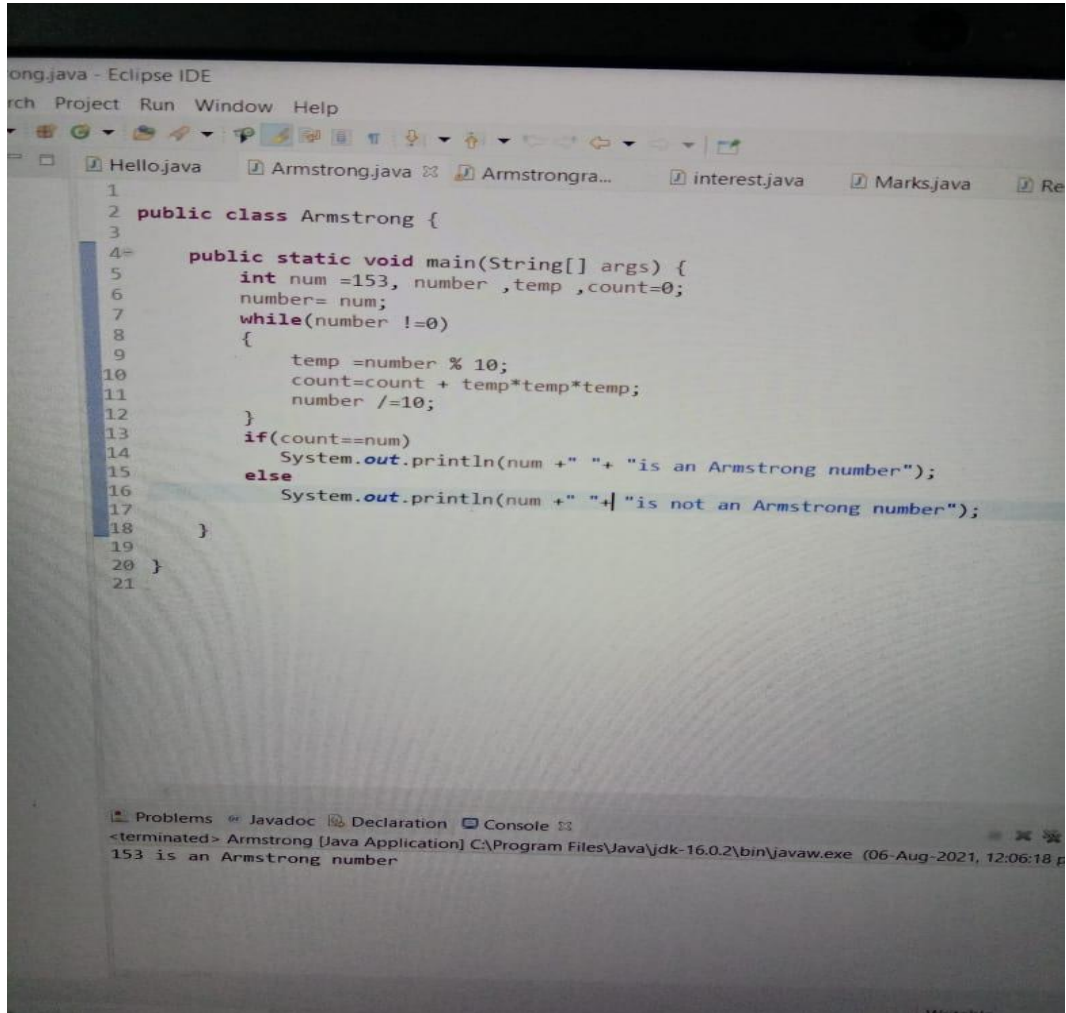


Core Java:

1.

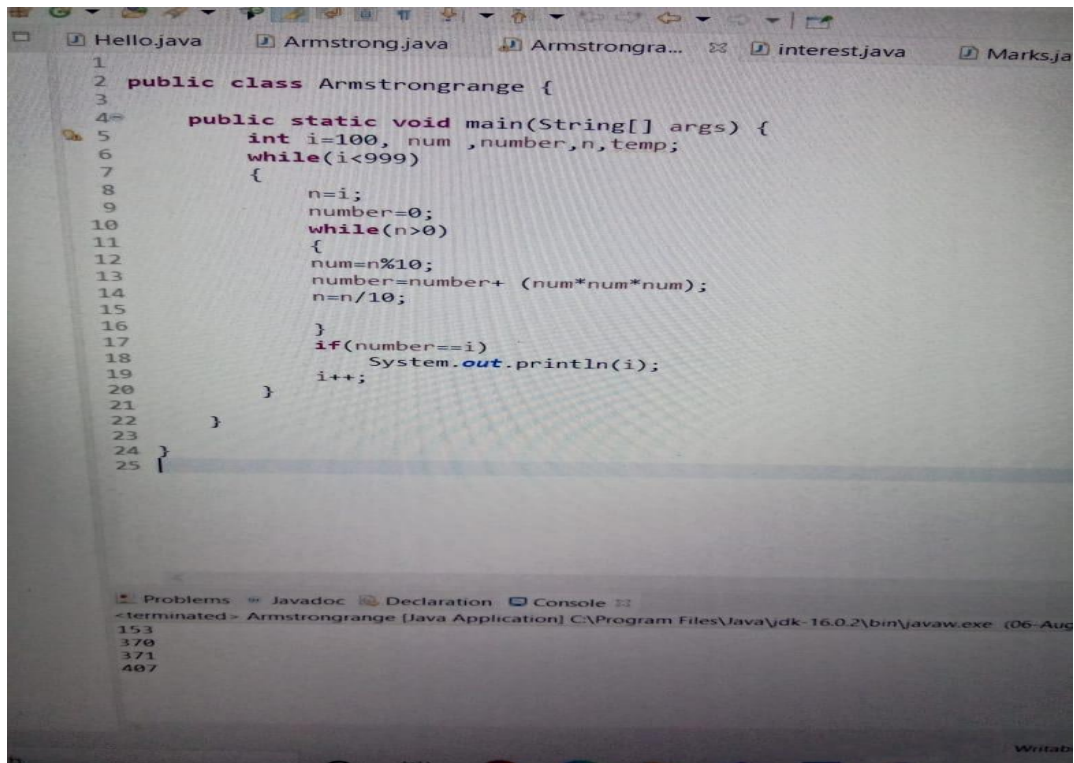


The screenshot shows the Eclipse IDE with a Java project. The main editor displays the code for a class named `Armstrong`. The code defines a `main` method that takes an array of strings as input. It initializes `num` to 153, `number` to `num`, and `count` to 0. A `while` loop runs as long as `number` is not zero. Inside the loop, the last digit of `number` is extracted using `temp = number % 10`, added to the cube of `count` (`count = count + temp * temp * temp`), and then `number` is divided by 10 (`number /= 10`). After the loop, an `if` statement checks if `count` equals `num`. If true, it prints "`153 is an Armstrong number`"; otherwise, it prints "`153 is not an Armstrong number`". The bottom console window shows the output: "`153 is an Armstrong number`".

```
1 public class Armstrong {
2
3
4     public static void main(String[] args) {
5         int num =153, number ,temp ,count=0;
6         number= num;
7         while(number !=0)
8         {
9             temp =number % 10;
10            count=count + temp*temp*temp;
11            number /=10;
12        }
13        if(count==num)
14            System.out.println(num + " " + "is an Armstrong number");
15        else
16            System.out.println(num + " " + "is not an Armstrong number");
17    }
18 }
19
20
21
```

Problems | Javadoc | Declaration | Console
<terminated> Armstrong [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.exe (06-Aug-2021, 12:06:18 p
153 is an Armstrong number

2.



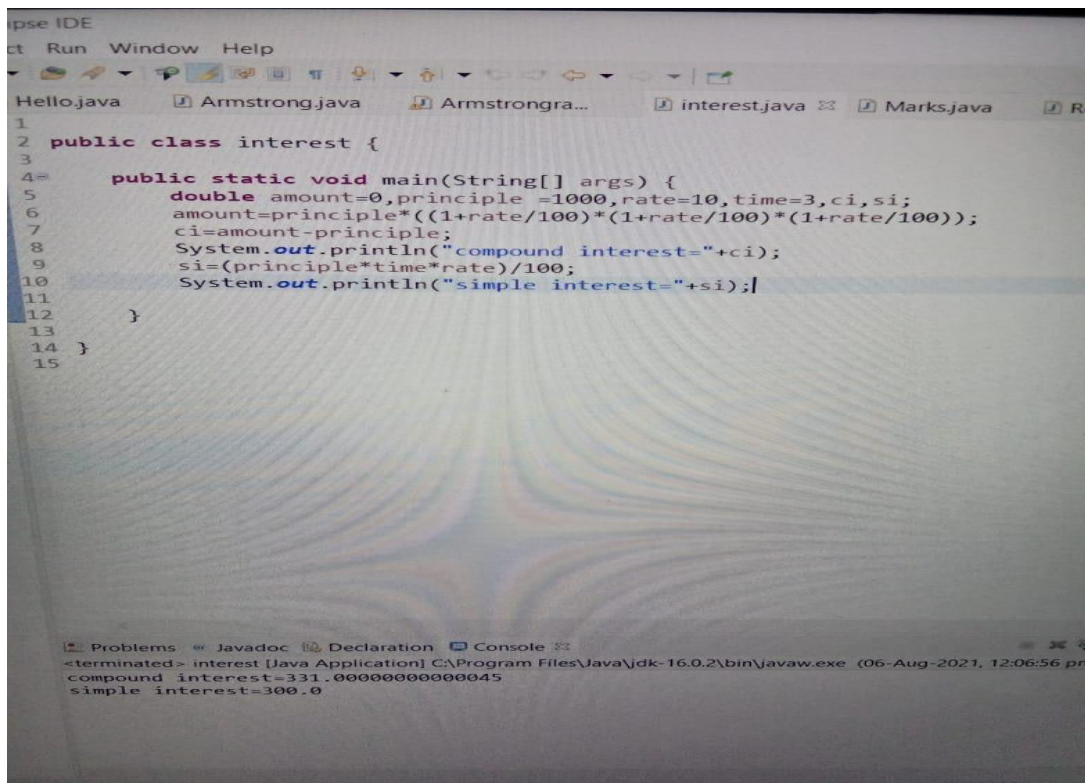
```
1 public class Armstrongrange {
2
3
4     public static void main(String[] args) {
5         int i=100, num ,number,n,temp;
6         while(i<999)
7         {
8             n=i;
9             number=0;
10            while(n>0)
11            {
12                num=n%10;
13                number=number+ (num*num*num);
14                n=n/10;
15            }
16            if(number==i)
17                System.out.println(i);
18            i++;
19        }
20    }
21 }
22 }
23 }
24 }
25 }
```

Problems Javadoc Declaration Console

<terminated> Armstrongrange [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.exe (06-Aug-2021, 12:06:56 pm)

153
370
371
407

3.



```
1 public class interest {
2
3
4     public static void main(String[] args) {
5         double amount=0,principle =1000,rate=10,time=3,ci,si;
6         amount=principle*((1+rate/100)*(1+rate/100)*(1+rate/100));
7         ci=amount-principle;
8         System.out.println("compound interest="+ci);
9         si=(principle*time*rate)/100;
10        System.out.println("simple interest="+si);
11    }
12 }
13 }
14 }
15 }
```

Problems Javadoc Declaration Console

<terminated> interest [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.exe (06-Aug-2021, 12:06:56 pm)

compound interest=331.00000000000045
simple interest=300.0

4.

The screenshot shows the IntelliJ IDEA IDE with the `Marks.java` file open. The code is as follows:

```
1 import java.util.Scanner;
2
3 public class Marks {
4     public static void main(String[] args) {
5         int sub1, sub2, sub3;
6         Scanner scanner = new Scanner(System.in);
7         System.out.print("marks of sub1");
8         sub1=scanner.nextInt();
9         System.out.print("marks of sub2");
10        sub2=scanner.nextInt();
11        System.out.print("marks of sub3");
12        sub3=scanner.nextInt();
13
14        if (sub1 > 60 && sub2 > 60 && sub3 > 60) {
15            System.out.println("Pass");
16        } else if (sub1 > 60 && sub2 > 60 && sub3 < 60) {
17            System.out.println("Promoted");
18        } else if (sub1 > 60 || sub2 < 60 && sub3 < 60) {
19            System.out.println("Fail");
20        }
21    }
22 }
```

The terminal output shows the execution of the program with the following input and output:

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021
marks of sub1 70
marks of sub2 75
marks of sub3 90
Pass

Process finished with exit code 0
```

5.

The screenshot shows the IntelliJ IDEA IDE with the `IncomeTax.java` file open. The code is as follows:

```
1 import java.util.Scanner;
2
3 public class IncomeTax {
4     public static void main(String args[]) {
5         double tax = 0, income;
6         Scanner sc = new Scanner(System.in);
7         while (true) {
8             System.out.println("Enter Income");
9             income = sc.nextDouble();
10            if (income <= 100000)
11                tax = 0;
12            else if (income <= 300000)
13                tax = 0.1 * income;
14            else if (income <= 500000)
15                tax = 0.2 * income;
16            else if (income <= 1000000)
17                tax = 0.3 * income;
18            System.out.println("Income tax is " + tax);
19            System.out.println();
20        }
21    }
22 }
```

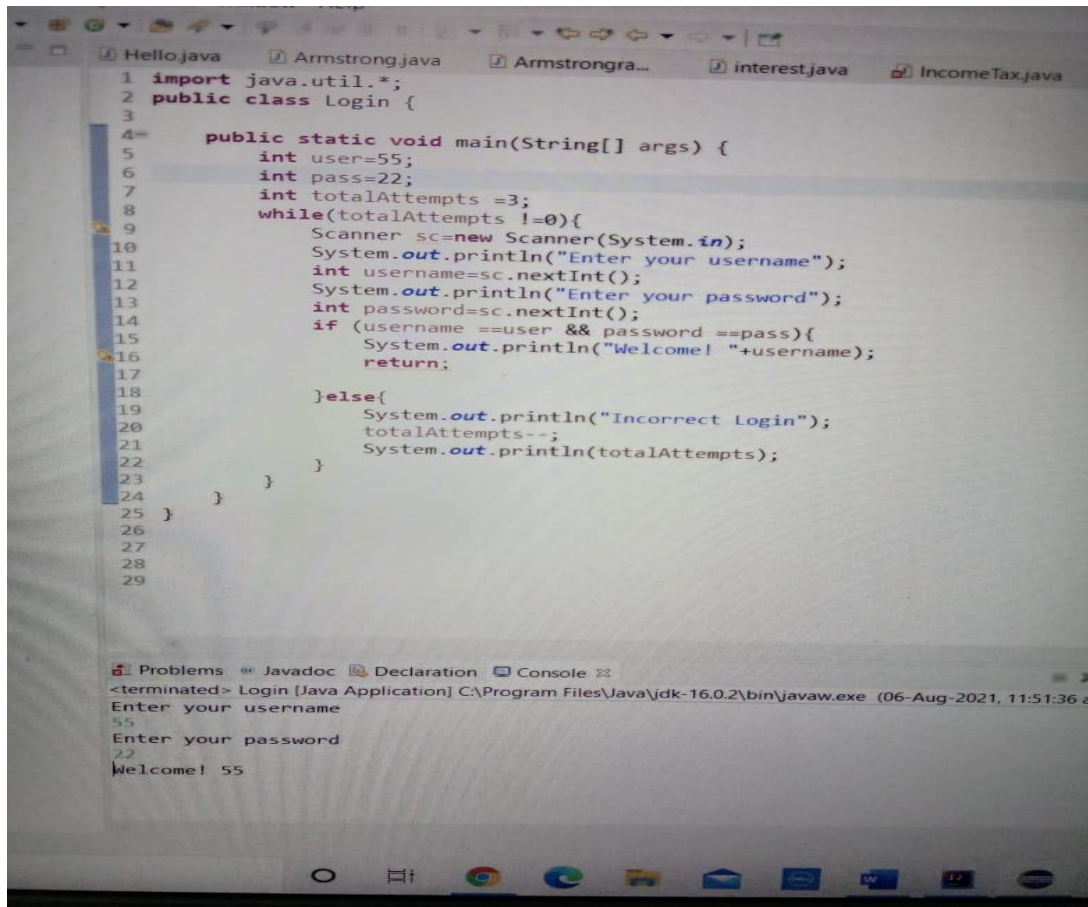
The terminal output shows the execution of the program with the following input and output:

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021
Enter Income
250000
Income tax is 25000.0

Enter Income
750000
Income tax is 285000.0

Enter Income
```


6.



```
1 import java.util.*;
2 public class Login {
3
4     public static void main(String[] args) {
5         int user=55;
6         int pass=22;
7         int totalAttempts =3;
8         while(totalAttempts !=0){
9             Scanner sc=new Scanner(System.in);
10            System.out.println("Enter your username");
11            int username=sc.nextInt();
12            System.out.println("Enter your password");
13            int password=sc.nextInt();
14            if (username ==user && password ==pass){
15                System.out.println("Welcome! "+username);
16                return;
17            }
18            }else{
19                System.out.println("Incorrect Login");
20                totalAttempts--;
21                System.out.println(totalAttempts);
22            }
23        }
24    }
25 }
26
27
28
29
```

Problems Javadoc Declaration Console

<terminated> Login [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.exe (06-Aug-2021, 11:51:36 a

Enter your username
55
Enter your password
22
Welcome! 55

7.

The screenshot shows the IntelliJ IDEA IDE with the `ArraySearch.java` file open. The code is as follows:

```
1 package Default;
2 import java.util.Arrays;
3 import java.util.Scanner;
4 public class ArraySearch {
5     public static void main(String args[]) {
6         int no, flag = 0;
7         System.out.println("array:");
8         int arr[] = {5, 12, 14, 6, 78, 19, 1, 23, 26, 35, 37, 7, 52, 86, 47};
9         System.out.println(Arrays.toString(arr));
10        System.out.println("Search no.");
11        Scanner scan = new Scanner(System.in);
12        no = scan.nextInt();
13        for (int i = 0; i < arr.length; i++) {
14            if (arr[i] == no) {
15                System.out.println("Number Found at " + ++i + " position");
16                flag = 1;
17            }
18        }
19    }
20 }
```

The terminal output shows the execution of the program:

```
"C:\Program Files\Java\jdk-16.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2\lib\idea_rt.jar"
array:
[5, 12, 14, 6, 78, 19, 1, 23, 26, 35, 37, 7, 52, 86, 47]
Search no.
23
Number Found at 8) position

Process finished with exit code 0
```

8.

The screenshot shows the IntelliJ IDEA IDE with the `Average.java` file open. The code is as follows:

```
1 import java.util.*;
2 public class Average {
3     public static void main(String[] args) {
4         Scanner in=new Scanner(System.in);
5         System.out.println("Enter the number of students");
6         int n=in.nextInt();
7         String name[]=new String[n];
8         int subject[]=new int[n];
9         int totalmarks[]=new int[n];
10        int grandtotal=0;
11        for(int i=0;i<n;i++){
12            in.nextLine();
13            System.out.println("Enter name of student" +(i + 1)+ " :");
14            name[i] = in.nextLine();
15            System.out.println("Enter no. of subject of student" +(i + 1)+ " :");
16            subject[i] = in.nextInt();
17            System.out.println("Enter total marks of student" +(i + 1)+ " :");
18            totalmarks[i] = in.nextInt();
19            grandtotal += totalmarks[i];
20        }
21        double avg=grandtotal/(double)n;
22        System.out.println("Average="+avg);
23        for(int i=0;i<n;i++){
24            final int i1=(totalmarks[i]/3);
25            System.out.println("Total marks entered is "+name[i]+" "+(totalmarks[i])+ " Average is"+i1);
26        }
27    }
28 }
29
30
31
32
```

The terminal output shows the execution of the program:

```
<terminated> Average [Java Application] C:\Program Files\Java\jdk-16.0.2\bin\javaw.exe (06-Aug-2021, 11:43:52 am - 11:44:57 am)
Enter total marks of student2:
Average=26.5
Total marks entered is Jerry 25 Average is8
Total marks entered is Lilly 28 Average is9
```