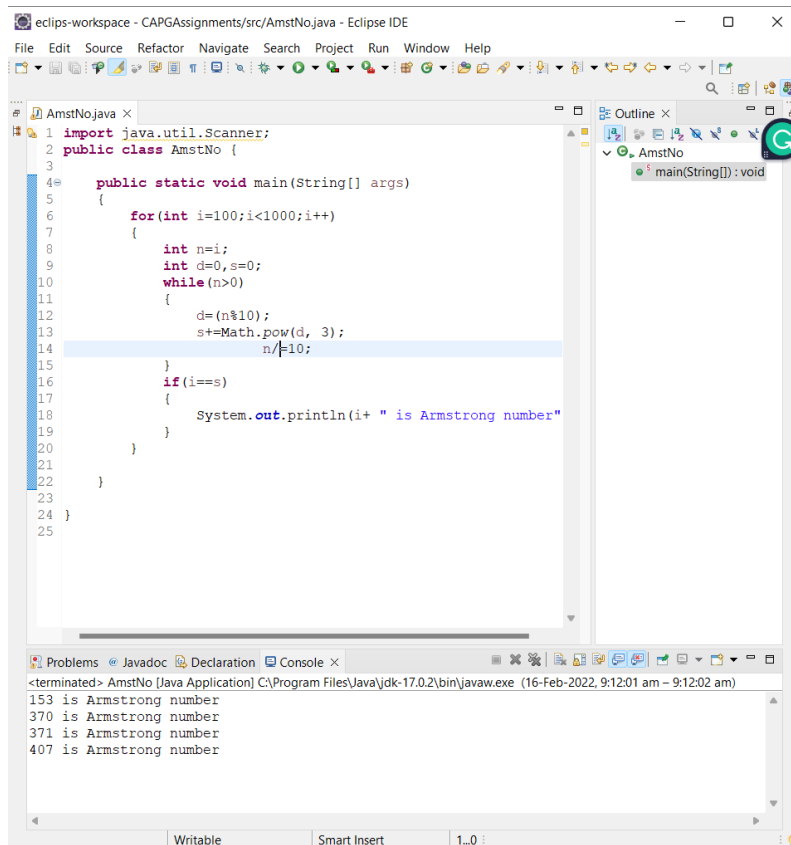


Basic Data Structure Assignment

Akshay. A. R

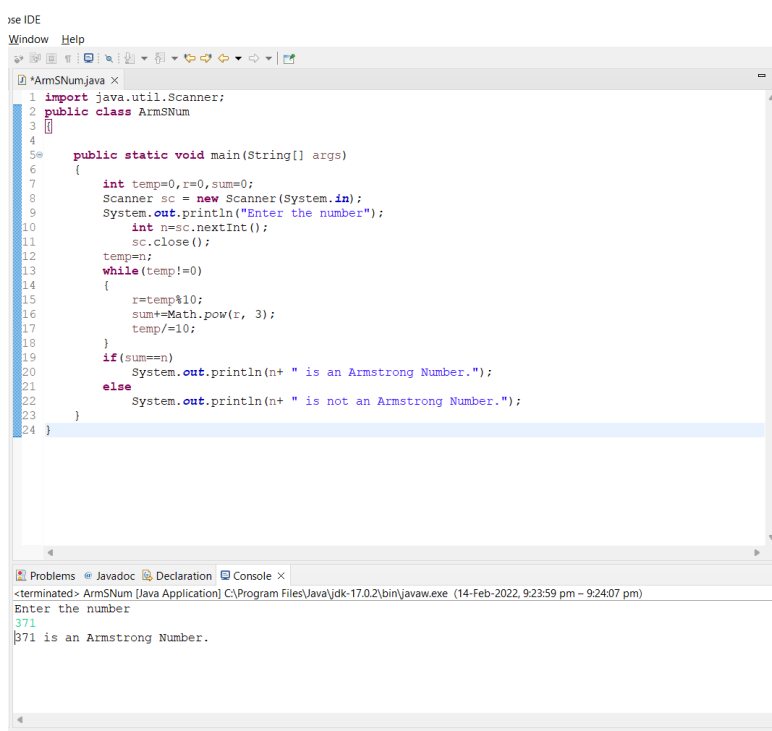
Assignment Question 1:



The screenshot shows the Eclipse IDE with the file `AmstNo.java` open. The code defines a class `AmstNo` with a `main` method that iterates from 100 to 1000, checking for Armstrong numbers. The console output shows the following results:

```
<terminated> AmstNo [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 9:12:01 am - 9:12:02 am)
153 is Armstrong number
370 is Armstrong number
371 is Armstrong number
407 is Armstrong number
```

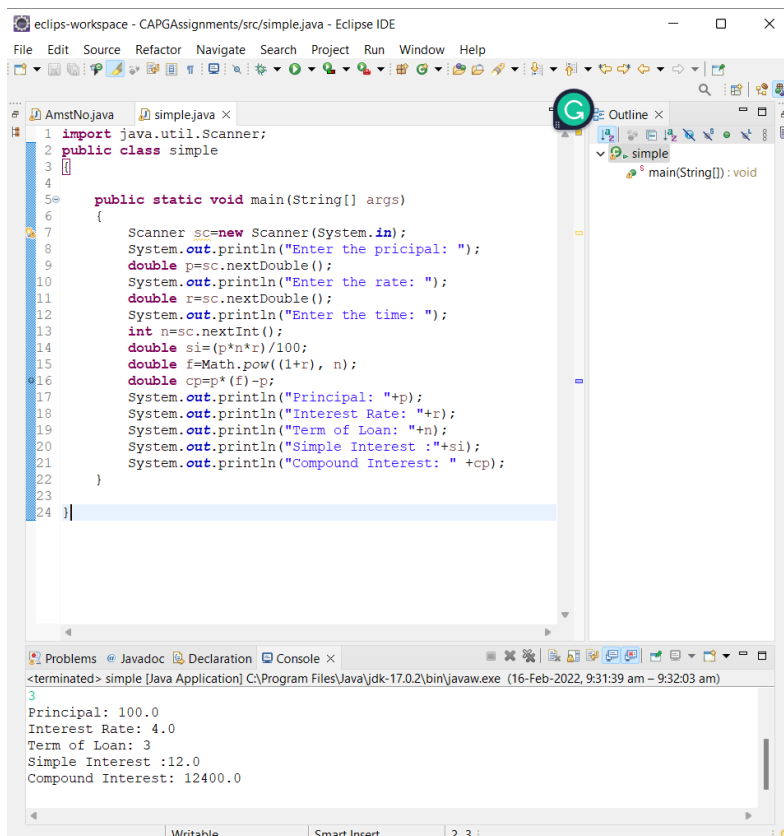
Assignment Question 2:



The screenshot shows the Eclipse IDE with the file `ArmSNum.java` open. The code defines a class `ArmSNum` with a `main` method that prompts the user to enter a number and checks if it is an Armstrong number. The console output shows the following results:

```
<terminated> ArmSNum [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (14-Feb-2022, 9:23:59 pm - 9:24:07 pm)
Enter the number
371
371 is an Armstrong Number.
```

Assignment Question 3:



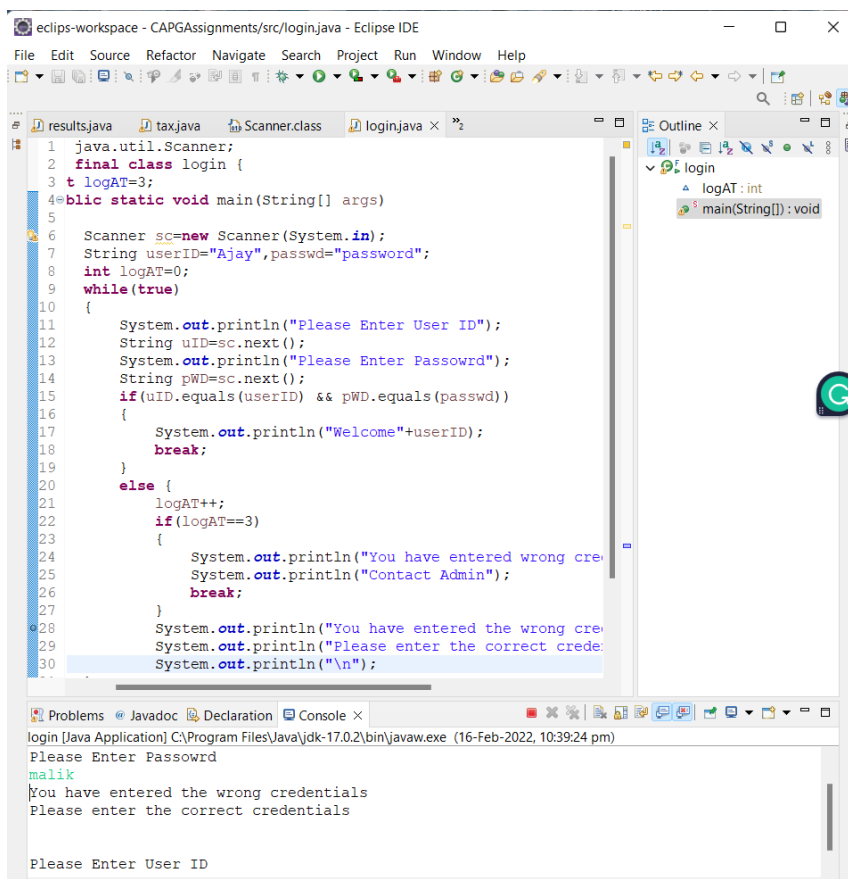
The screenshot shows the Eclipse IDE with a Java project named 'CAPGAssignments'. The file 'simple.java' is open in the editor. The code defines a public class 'simple' with a main method that uses a Scanner to take input for principal, rate, and time, then calculates simple and compound interest. The console output shows the results of the program execution.

```
1 import java.util.Scanner;
2 public class simple
3 {
4
5     public static void main(String[] args)
6     {
7         Scanner sc=new Scanner(System.in);
8         System.out.println("Enter the pricipal: ");
9         double p=sc.nextDouble();
10        System.out.println("Enter the rate: ");
11        double r=sc.nextDouble();
12        System.out.println("Enter the time: ");
13        int n=sc.nextInt();
14        double si=(p*n*r)/100;
15        double f=Math.pow(1+r, n);
16        double cp=p*(f)-p;
17        System.out.println("Principal: "+p);
18        System.out.println("Interest Rate: "+r);
19        System.out.println("Term of Loan: "+n);
20        System.out.println("Simple Interest :"+si);
21        System.out.println("Compound Interest: " +cp);
22    }
23 }
24 }
```

Console Output:

```
<terminated> simple [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 9:31:39 am - 9:32:03 am)
3
Principal: 100.0
Interest Rate: 4.0
Term of Loan: 3
Simple Interest :12.0
Compound Interest: 12400.0
```

Assignment Question 4:



The screenshot shows the Eclipse IDE with a Java project named 'CAPGAssignments'. The file 'login.java' is open in the editor. The code defines a public class 'login' with a main method that uses a Scanner to take input for user ID and password, then checks if the credentials are correct. The console output shows the results of the program execution.

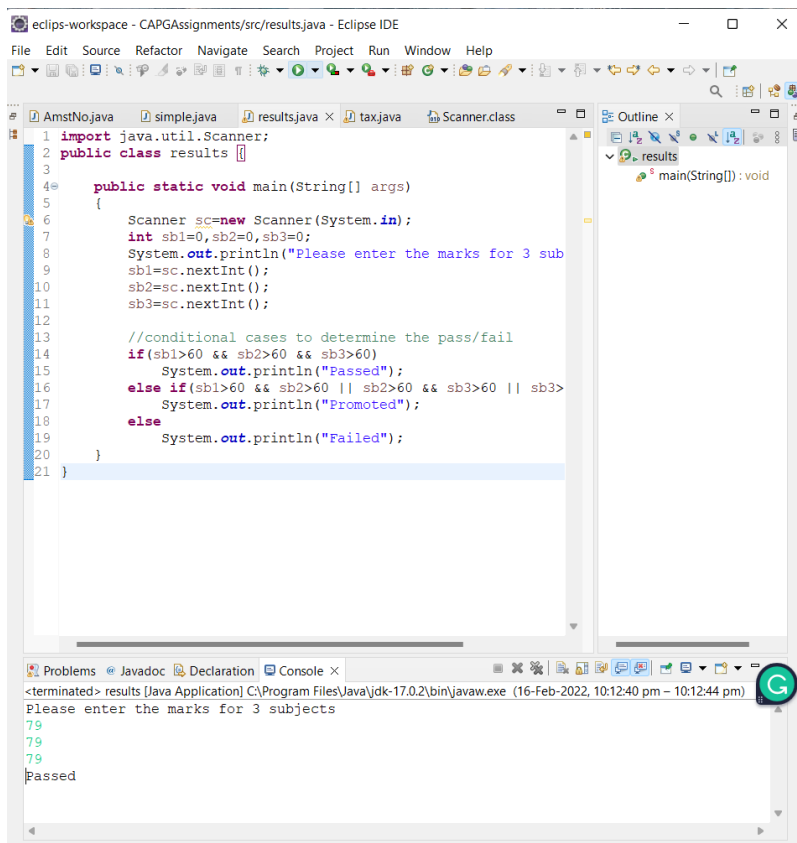
```
1 java.util.Scanner;
2 final class login {
3     t logAT=3;
4     public static void main(String[] args)
5     {
6         Scanner sc=new Scanner(System.in);
7         String userID="Ajay",passwd="password";
8         int logAT=0;
9         while(true)
10        {
11            System.out.println("Please Enter User ID");
12            String uID=sc.next();
13            System.out.println("Please Enter Passowrd");
14            String pWD=sc.next();
15            if(uID.equals(userID) && pWD.equals(passwd))
16            {
17                System.out.println("Welcome"+userID);
18                break;
19            }
20            else {
21                logAT++;
22                if(logAT==3)
23                {
24                    System.out.println("You have entered wrong cre");
25                    System.out.println("Contact Admin");
26                    break;
27                }
28                System.out.println("You have entered the wrong cre");
29                System.out.println("Please enter the correct crede");
30                System.out.println("\n");
31            }
32        }
33    }
34 }
```

Console Output:

```
login [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 10:39:24 pm)
Please Enter Password
malik
You have entered the wrong credentials
Please enter the correct credentials

Please Enter User ID
```

Assignment Question 5:



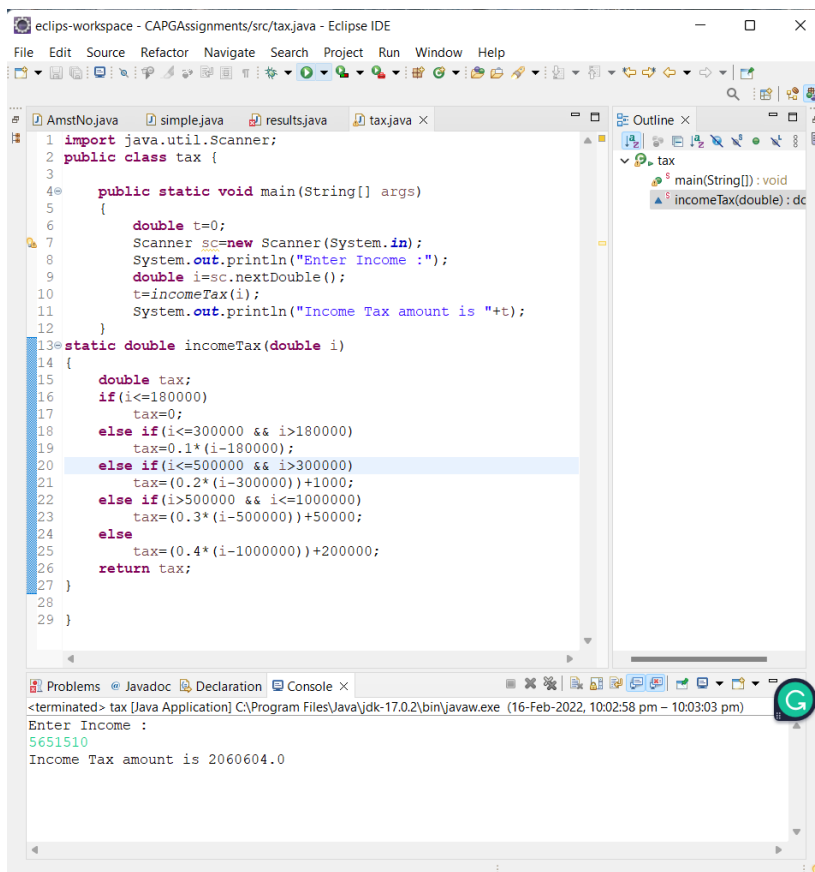
The screenshot shows the Eclipse IDE with the file `results.java` open. The code defines a `results` class with a `main` method that uses a `Scanner` to read three integers and prints a status based on conditional checks. The console output shows the program running successfully and printing "Passed".

```
1 import java.util.Scanner;
2 public class results {
3
4     public static void main(String[] args)
5     {
6         Scanner sc=new Scanner(System.in);
7         int sb1=0,sb2=0,sb3=0;
8         System.out.println("Please enter the marks for 3 sub
9         sb1=sc.nextInt();
10        sb2=sc.nextInt();
11        sb3=sc.nextInt();
12
13        //conditional cases to determine the pass/fail
14        if(sb1>60 && sb2>60 && sb3>60)
15            System.out.println("Passed");
16        else if (sb1>60 && sb2>60 || sb2>60 && sb3>60 || sb3>
17            System.out.println("Promoted");
18        else
19            System.out.println("Failed");
20    }
21 }
```

Console Output:

```
<terminated> results [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 10:12:44 pm)
Please enter the marks for 3 subjects
79
79
79
Passed
```

Assignment Question 6:



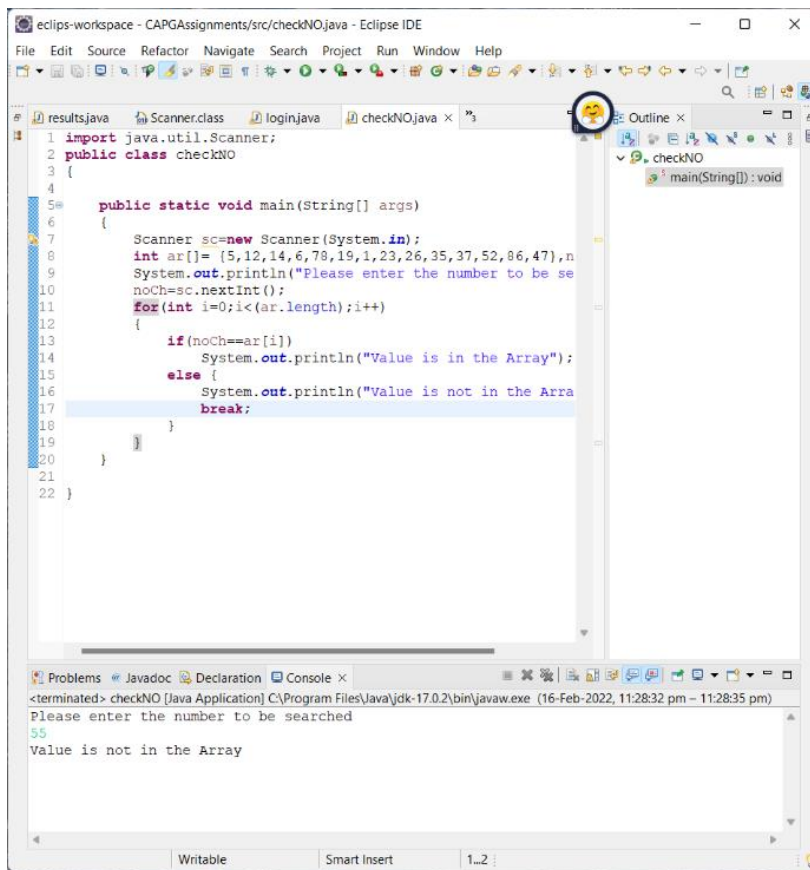
The screenshot shows the Eclipse IDE with the file `tax.java` open. The code defines a `tax` class with a `main` method that reads a double value and calculates income tax based on a series of conditional checks. The console output shows the program running successfully and printing the calculated tax amount.

```
1 import java.util.Scanner;
2 public class tax {
3
4     public static void main(String[] args)
5     {
6         double t=0;
7         Scanner sc=new Scanner(System.in);
8         System.out.println("Enter Income :");
9         double i=sc.nextDouble();
10        t=incomeTax(i);
11        System.out.println("Income Tax amount is "+t);
12    }
13    static double incomeTax(double i)
14    {
15        double tax;
16        if(i<=180000)
17            tax=0;
18        else if(i<=300000 && i>180000)
19            tax=0.1*(i-180000);
20        else if(i<=500000 && i>300000)
21            tax=(0.2*(i-300000))+1000;
22        else if(i>500000 && i<=1000000)
23            tax=(0.3*(i-500000))+50000;
24        else
25            tax=(0.4*(i-1000000))+200000;
26        return tax;
27    }
28 }
29 }
```

Console Output:

```
<terminated> tax [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 10:02:58 pm - 10:03:03 pm)
Enter Income :
5651510
Income Tax amount is 2060604.0
```

Assignment Question 7:



```
1 import java.util.Scanner;
2 public class checkNO
3 {
4
5     public static void main(String[] args)
6     {
7         Scanner sc=new Scanner(System.in);
8         int ar[]={ 5,12,14,6,78,19,1,23,26,35,37,52,86,47},n
9         System.out.println("Please enter the number to be se
10        noCh=sc.nextInt();
11        for(int i=0;i<(ar.length);i++)
12        {
13            if(noCh==ar[i])
14                System.out.println("Value is in the Array");
15            else {
16                System.out.println("Value is not in the Arra
17                break;
18            }
19        }
20    }
21 }
22 }
```

Problems Javadoc Declaration Console x

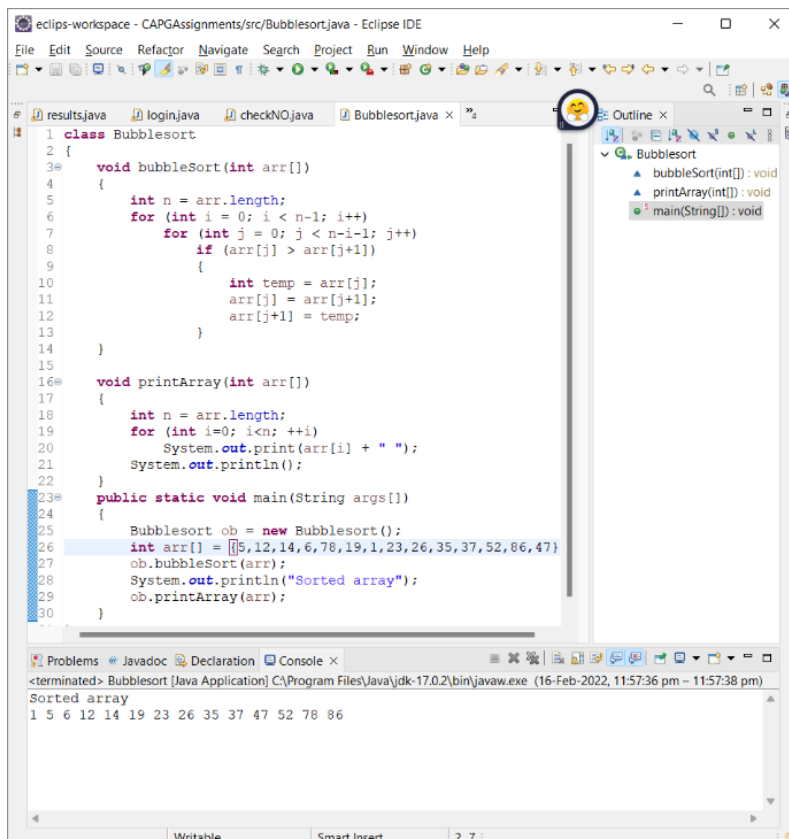
<terminated> checkNO [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 11:28:32 pm – 11:28:35 pm)

Please enter the number to be searched

55

Value is not in the Array

Assignment Question 8:



```
1 class Bubblesort
2 {
3     void bubbleSort(int arr[])
4     {
5         int n = arr.length;
6         for (int i = 0; i < n-1; i++)
7             for (int j = 0; j < n-i-1; j++)
8                 if (arr[j] > arr[j+1])
9                 {
10                     int temp = arr[j];
11                     arr[j] = arr[j+1];
12                     arr[j+1] = temp;
13                 }
14     }
15     void printArray(int arr[])
16     {
17         int n = arr.length;
18         for (int i=0; i<n; ++i)
19             System.out.print(arr[i] + " ");
20         System.out.println();
21     }
22     public static void main(String args[])
23     {
24         Bubblesort ob = new Bubblesort();
25         int arr[] = {5,12,14,6,78,19,1,23,26,35,37,52,86,47};
26         ob.bubbleSort(arr);
27         System.out.println("Sorted array");
28         ob.printArray(arr);
29     }
30 }
```

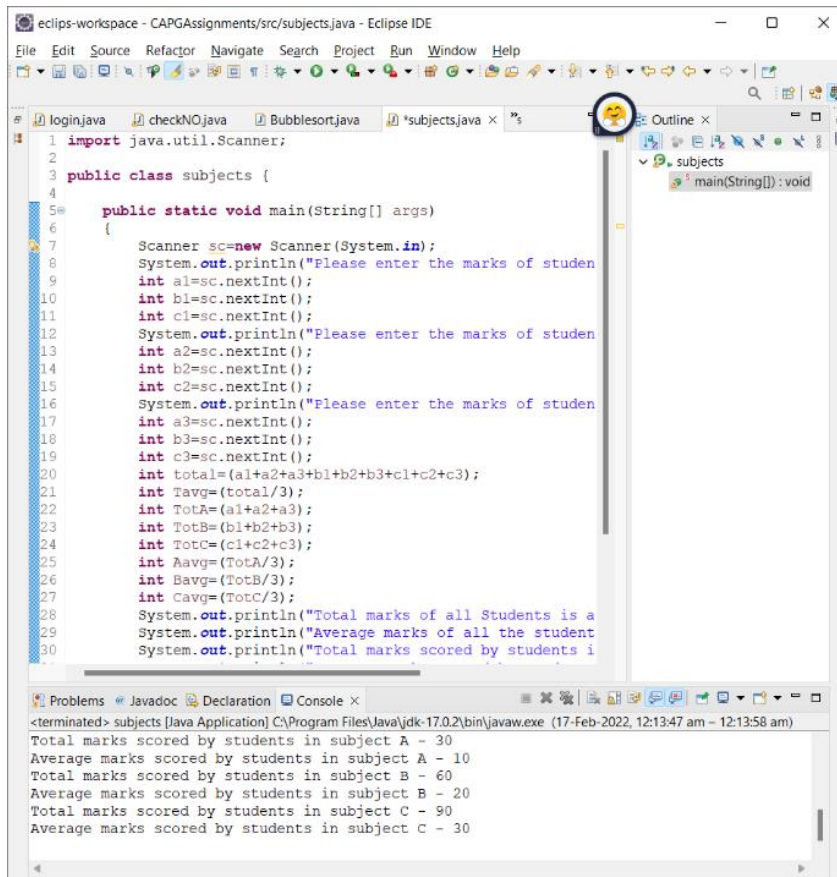
Problems Javadoc Declaration Console x

<terminated> Bubblesort [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (16-Feb-2022, 11:57:36 pm – 11:57:38 pm)

Sorted array

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

Assignment Question 9:



The screenshot shows the Eclipse IDE with a Java project named 'CAPGAssignments'. The source file 'subjects.java' is open, displaying a Java program that calculates total and average marks for three subjects (A, B, and C). The program uses a Scanner to take input for marks and performs calculations for totals and averages. The console output shows the results of the program execution.

```
1 import java.util.Scanner;
2
3 public class subjects {
4
5     public static void main(String[] args)
6     {
7         Scanner sc=new Scanner(System.in);
8         System.out.println("Please enter the marks of student A");
9         int a1=sc.nextInt();
10        int b1=sc.nextInt();
11        int c1=sc.nextInt();
12        System.out.println("Please enter the marks of student B");
13        int a2=sc.nextInt();
14        int b2=sc.nextInt();
15        int c2=sc.nextInt();
16        System.out.println("Please enter the marks of student C");
17        int a3=sc.nextInt();
18        int b3=sc.nextInt();
19        int c3=sc.nextInt();
20        int total=(a1+a2+a3+b1+b2+b3+c1+c2+c3);
21        int Tavg=(total/3);
22        int TotA=(a1+a2+a3);
23        int TotB=(b1+b2+b3);
24        int TotC=(c1+c2+c3);
25        int Aavg=(TotA/3);
26        int Bavg=(TotB/3);
27        int Cavg=(TotC/3);
28        System.out.println("Total marks of all Students is a");
29        System.out.println("Average marks of all the student");
30        System.out.println("Total marks scored by students in subject A - 30");
31        System.out.println("Average marks scored by students in subject A - 10");
32        System.out.println("Total marks scored by students in subject B - 60");
33        System.out.println("Average marks scored by students in subject B - 20");
34        System.out.println("Total marks scored by students in subject C - 90");
35        System.out.println("Average marks scored by students in subject C - 30");
36    }
37 }
```

Console Output:

```
<terminated> subjects [Java Application] C:\Program Files\Java\jdk-17.0.2\bin\javaw.exe (17-Feb-2022, 12:13:47 am - 12:13:58 am)
Total marks scored by students in subject A - 30
Average marks scored by students in subject A - 10
Total marks scored by students in subject B - 60
Average marks scored by students in subject B - 20
Total marks scored by students in subject C - 90
Average marks scored by students in subject C - 30
```