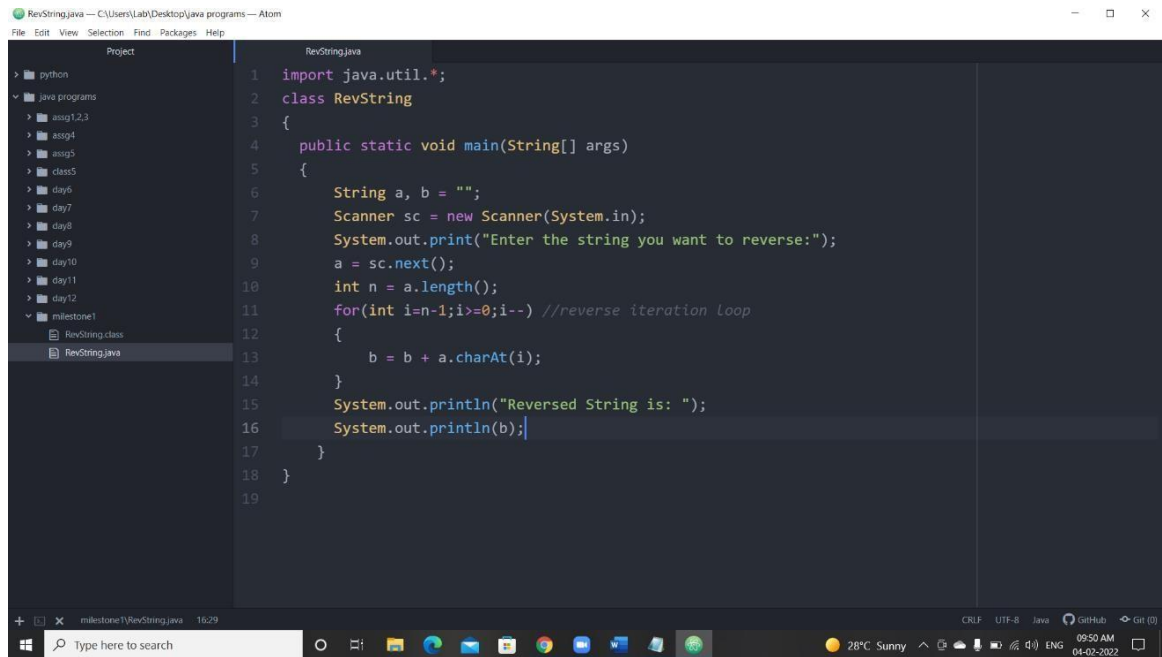


# MILESTONE-1

NAJMA E-211495

# 1. Write a Java Program to reverse a string without using String inbuilt function reverse ().



The screenshot shows the Atom editor with a file named 'RevString.java' open. The code is as follows:

```
1 import java.util.*;
2 class RevString
3 {
4     public static void main(String[] args)
5     {
6         String a, b = "";
7         Scanner sc = new Scanner(System.in);
8         System.out.print("Enter the string you want to reverse:");
9         a = sc.next();
10        int n = a.length();
11        for(int i=n-1;i>=0;i--) //reverse iteration loop
12        {
13            b = b + a.charAt(i);
14        }
15        System.out.println("Reversed String is: ");
16        System.out.println(b);
17    }
18 }
19
```

The left sidebar shows a project structure with folders like 'python', 'java programs', and 'milestone1'. The bottom status bar shows the file path 'C:\Users\Lab\Desktop\java programs\milestone1\RevString.java' and the time '16:29'.



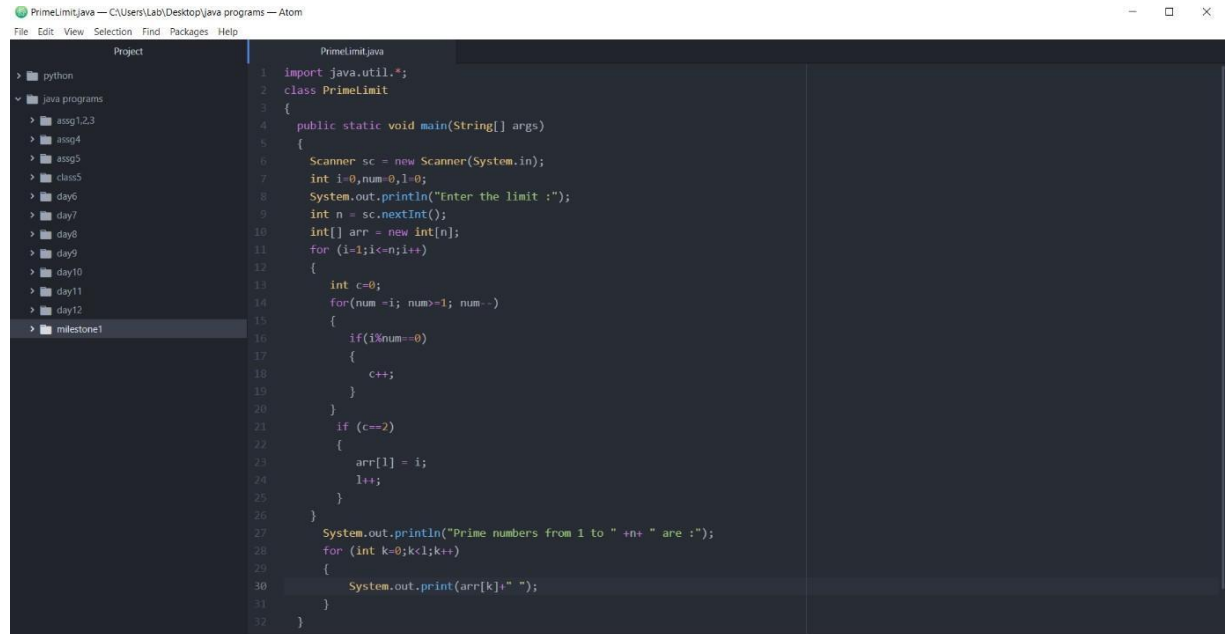
The screenshot shows a terminal window with the following commands and output:

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac RevString.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java RevString
Enter the string you want to reverse:Adithya
Reversed String is:
ayhtidA
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

2. Write a program to take an input number from the programmer and calculate all the prime numbers from 0 to that number. Store all the prime numbers in an array and display the array elements.

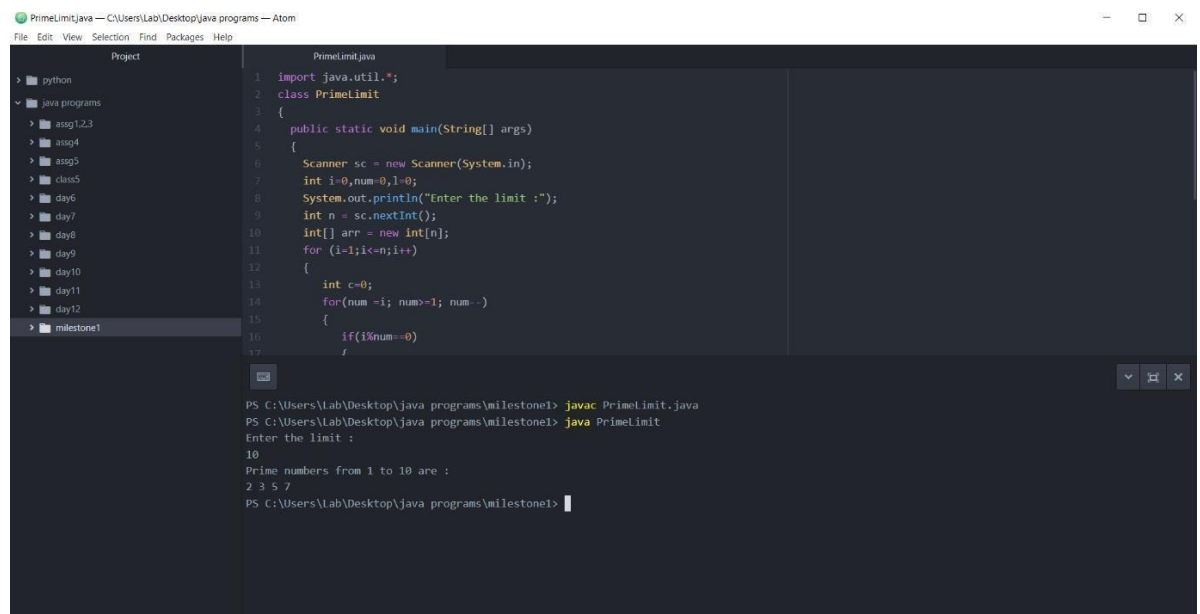
Example: Input=10 Output:

1,2,3,5,7



The screenshot shows an IDE window titled 'PrimeLimit.java' with the following code:

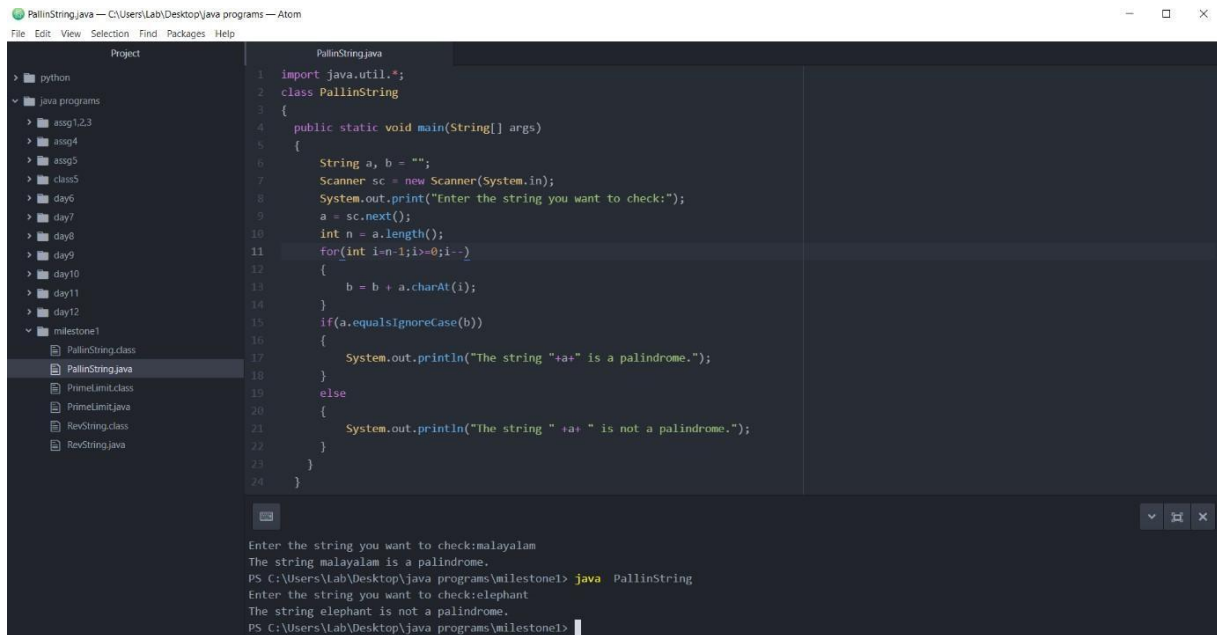
```
1 import java.util.*;
2 class PrimeLimit
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         int i=0,num=0,l=0;
8         System.out.println("Enter the limit :");
9         int n = sc.nextInt();
10        int[] arr = new int[n];
11        for (i=1;i<=n;i++)
12        {
13            int c=0;
14            for(num =i; num>=1; num--)
15            {
16                if(i%num==0)
17                {
18                    c++;
19                }
20            }
21            if (c==2)
22            {
23                arr[i] = i;
24                l++;
25            }
26        }
27        System.out.println("Prime numbers from 1 to " +n+ " are :");
28        for (int k=0;k<l;k++)
29        {
30            System.out.print(arr[k]+" ");
31        }
32    }
```



The screenshot shows the same IDE window with the code from the previous image. Below the code editor, the command prompt output is visible:

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac PrimeLimit.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java PrimeLimit
Enter the limit :
10
Prime numbers from 1 to 10 are :
2 3 5 7
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

### 3. Write a Java Program to find whether a string or number is palindrome or not.



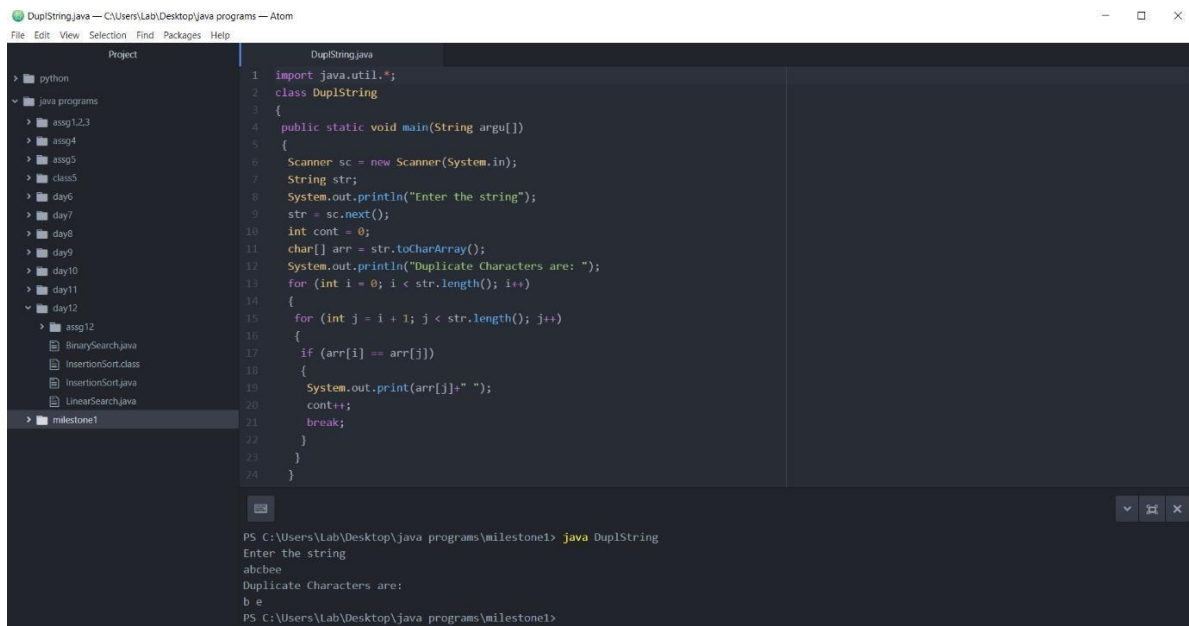
The screenshot shows an IDE window titled "PalinString.java - C:\Users\Lab\Desktop\java programs - Atom". The left sidebar displays a project tree with folders like "python", "java programs", and "milestone1". The main editor shows the code for "PalinString.java".

```
1 import java.util.*;
2 class PalinString
3 {
4     public static void main(String[] args)
5     {
6         String a, b = "";
7         Scanner sc = new Scanner(System.in);
8         System.out.print("Enter the string you want to check:");
9         a = sc.next();
10        int n = a.length();
11        for(int i=n-1;i>=0;i--)
12        {
13            b = b + a.charAt(i);
14        }
15        if(a.equalsIgnoreCase(b))
16        {
17            System.out.println("The string "+a+" is a palindrome.");
18        }
19        else
20        {
21            System.out.println("The string "+a+" is not a palindrome.");
22        }
23    }
24 }
```

The output console at the bottom shows the program's execution:

```
Enter the string you want to check:malayalam
The string malayalam is a palindrome.
PS C:\Users\Lab\Desktop\java programs\milestone1> java PalinString
Enter the string you want to check:elephant
The string elephant is not a palindrome.
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

### 4. Write a Java Program to find the duplicate characters in a string.



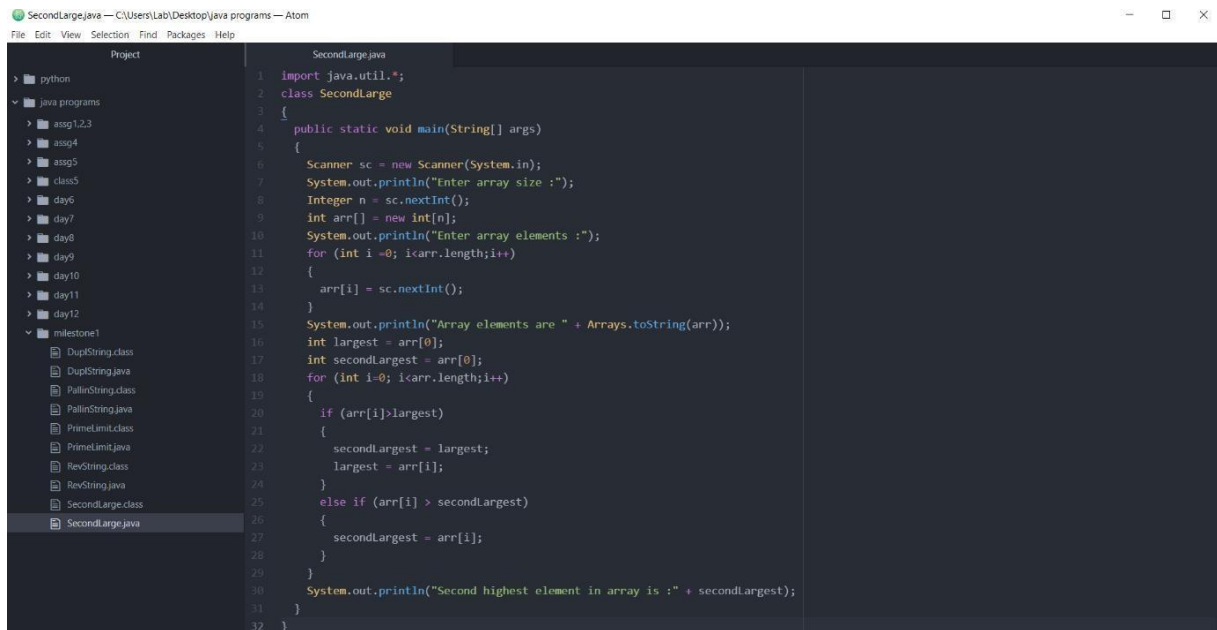
The screenshot shows an IDE window titled "DuplString.java - C:\Users\Lab\Desktop\java programs - Atom". The left sidebar displays a project tree with folders like "python", "java programs", and "milestone1". The main editor shows the code for "DuplString.java".

```
1 import java.util.*;
2 class DuplString
3 {
4     public static void main(String argu[])
5     {
6         Scanner sc = new Scanner(System.in);
7         String str;
8         System.out.println("Enter the string");
9         str = sc.next();
10        int cont = 0;
11        char[] arr = str.toCharArray();
12        System.out.println("Duplicate Characters are: ");
13        for (int i = 0; i < str.length(); i++)
14        {
15            for (int j = i + 1; j < str.length(); j++)
16            {
17                if (arr[i] == arr[j])
18                {
19                    System.out.print(arr[j]+" ");
20                    cont++;
21                    break;
22                }
23            }
24        }
```

The output console at the bottom shows the program's execution:

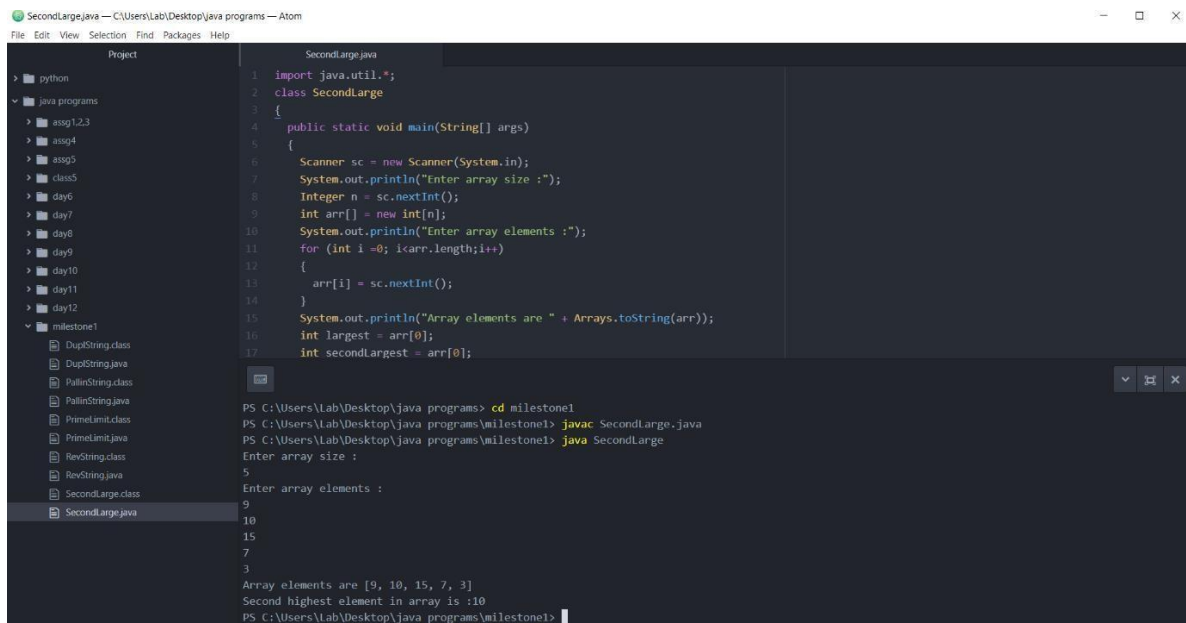
```
PS C:\Users\Lab\Desktop\java programs\milestone1> java DuplString
Enter the string
abcbee
Duplicate Characters are:
b e
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 5. Write a Java Program to find the second-highest number in an array.



The screenshot shows an IDE window titled "SecondLarge.java" with a project explorer on the left and a code editor on the right. The project explorer shows a project named "java programs" with several sub-projects, including "milestone1" which contains the file "SecondLarge.java". The code editor displays the following Java code:

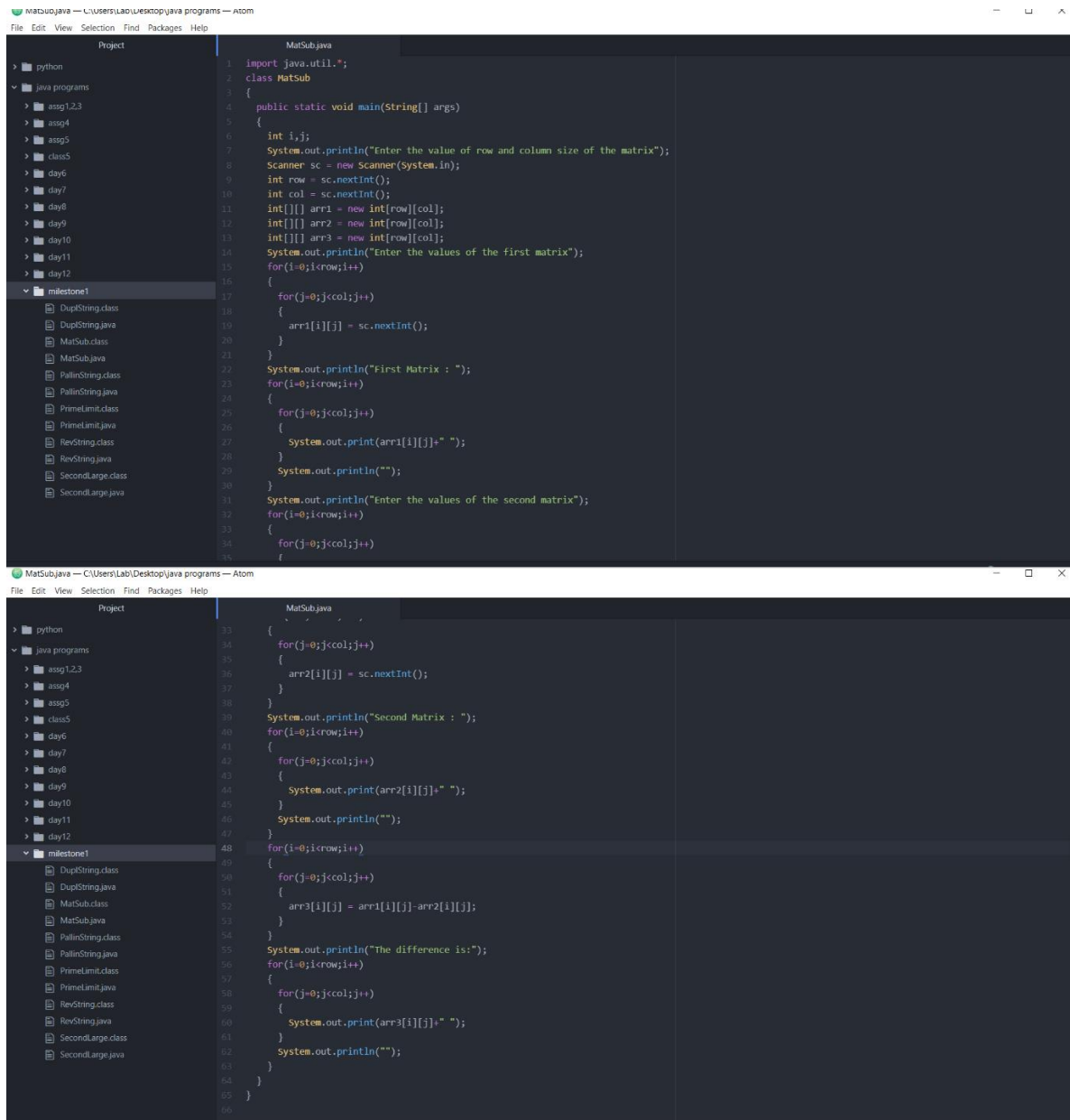
```
1 import java.util.*;
2 class SecondLarge
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         System.out.println("Enter array size :");
8         Integer n = sc.nextInt();
9         int arr[] = new int[n];
10        System.out.println("Enter array elements :");
11        for (int i = 0; i < arr.length; i++)
12        {
13            arr[i] = sc.nextInt();
14        }
15        System.out.println("Array elements are " + Arrays.toString(arr));
16        int largest = arr[0];
17        int secondLargest = arr[0];
18        for (int i = 0; i < arr.length; i++)
19        {
20            if (arr[i] > largest)
21            {
22                secondLargest = largest;
23                largest = arr[i];
24            }
25            else if (arr[i] > secondLargest)
26            {
27                secondLargest = arr[i];
28            }
29        }
30        System.out.println("Second highest element in array is : " + secondLargest);
31    }
32 }
```



The screenshot shows the same IDE window, but now the code editor is displaying the output of the program. The project explorer on the left is the same. The code editor shows the following output:

```
PS C:\Users\Lab\Desktop\java programs> cd milestone1
PS C:\Users\Lab\Desktop\java programs\milestone1> javac SecondLarge.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java SecondLarge
Enter array size :
5
Enter array elements :
9
10
15
7
3
Array elements are [9, 10, 15, 7, 3]
Second highest element in array is :10
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 6. Write a java program to subtract two matrices. Take the input of the matrices from the user.



```
MatSub.java
1  import java.util.*;
2  class MatSub
3  {
4      public static void main(String[] args)
5      {
6          int i,j;
7          System.out.println("Enter the value of row and column size of the matrix");
8          Scanner sc = new Scanner(System.in);
9          int row = sc.nextInt();
10         int col = sc.nextInt();
11         int[][] arr1 = new int[row][col];
12         int[][] arr2 = new int[row][col];
13         int[][] arr3 = new int[row][col];
14         System.out.println("Enter the values of the first matrix");
15         for(i=0;i<row;i++)
16         {
17             for(j=0;j<col;j++)
18             {
19                 arr1[i][j] = sc.nextInt();
20             }
21         }
22         System.out.println("First Matrix : ");
23         for(i=0;i<row;i++)
24         {
25             for(j=0;j<col;j++)
26             {
27                 System.out.print(arr1[i][j]+" ");
28             }
29             System.out.println("");
30         }
31         System.out.println("Enter the values of the second matrix");
32         for(i=0;i<row;i++)
33         {
34             for(j=0;j<col;j++)
35             {
36                 arr2[i][j] = sc.nextInt();
37             }
38         }
39         System.out.println("Second Matrix : ");
40         for(i=0;i<row;i++)
41         {
42             for(j=0;j<col;j++)
43             {
44                 System.out.print(arr2[i][j]+" ");
45             }
46             System.out.println("");
47         }
48         for(i=0;i<row;i++)
49         {
50             for(j=0;j<col;j++)
51             {
52                 arr3[i][j] = arr1[i][j]-arr2[i][j];
53             }
54         }
55         System.out.println("The difference is:");
56         for(i=0;i<row;i++)
57         {
58             for(j=0;j<col;j++)
59             {
60                 System.out.print(arr3[i][j]+" ");
61             }
62             System.out.println("");
63         }
64     }
65 }
```

```
MatSubJava - C:\Users\Lab\Desktop\java programs - Atom
File Edit View Selection Find Packages Help

Project
python
java programs
  assg1,2,3
  assg4
  assg5
  class5
  day6
  day7
  day8
  day9
  day10
  day11
  day12
  milestone1
    DupString.class
    DupString.java
    MatSub.class
    MatSub.java
    PalinString.class
    PalinString.java
    PrimeLimit.class
    PrimeLimit.java
    RevString.class
    RevString.java
    SecondLarge.class
    SecondLarge.java

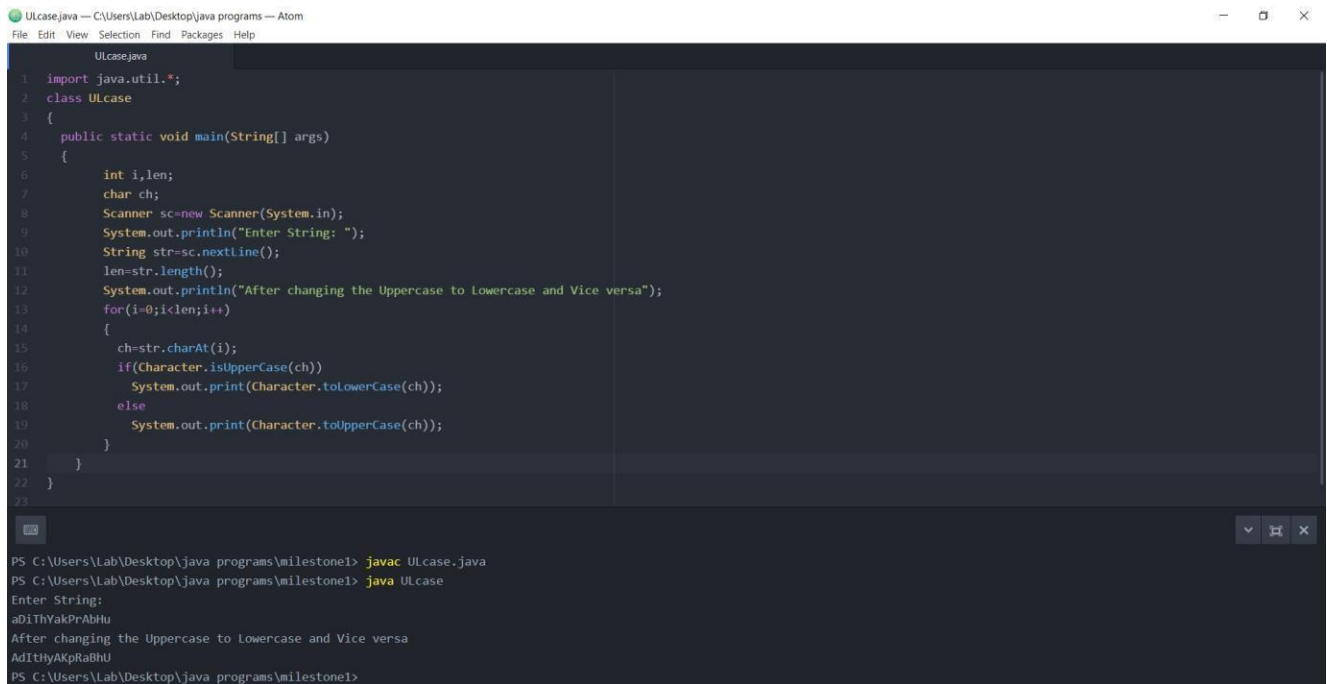
PS C:\Users\Lab\Desktop\java programs\milestone1> java MatSub
Enter the value of row and column size of the matrix
3
3
Enter the values of the first matrix
6
7
8
9
8
7
First Matrix :
6 7 8
9 8 7
6 5 9
Enter the values of the second matrix
1
2
3
4
3
```

```
MatSubJava - C:\Users\Lab\Desktop\java programs - Atom
File Edit View Selection Find Packages Help

Project
python
java programs
  assg1,2,3
  assg4
  assg5
  class5
  day6
  day7
  day8
  day9
  day10
  day11
  day12
  milestone1
    DupString.class
    DupString.java
    MatSub.class
    MatSub.java
    PalinString.class
    PalinString.java
    PrimeLimit.class
    PrimeLimit.java
    RevString.class
    RevString.java
    SecondLarge.class
    SecondLarge.java

9
First Matrix :
6 7 8
9 8 7
6 5 9
Enter the values of the second matrix
1
2
3
4
3
Second Matrix :
1 2 3
4 3 2
5 4 3
The difference is:
5 5 5
5 5 5
1 1 6
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

7. Write a java program to take a string input from the user. Convert all the uppercase letters to lowercase and vice-versa.



```
ULcase.java
1 import java.util.*;
2 class ULcase
3 {
4     public static void main(String[] args)
5     {
6         int i,len;
7         char ch;
8         Scanner sc=new Scanner(System.in);
9         System.out.println("Enter String: ");
10        String str=sc.nextLine();
11        len=str.length();
12        System.out.println("After changing the Uppercase to Lowercase and Vice versa");
13        for(i=0;i<len;i++)
14        {
15            ch=str.charAt(i);
16            if(Character.isUpperCase(ch))
17                System.out.print(Character.toLowerCase(ch));
18            else
19                System.out.print(Character.toUpperCase(ch));
20        }
21    }
22 }
23
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac ULcase.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java ULcase
Enter String:
aDiThYakPrAbHu
After changing the Uppercase to Lowercase and Vice versa
AdiThyAKpRaBhU
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

8. Write a java program to take an input array of integers and sort the array using insertion sort.



```
InsertSort.java
1 import java.util.Scanner;
2 public class InsertSort
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc=new Scanner(System.in);
7         System.out.println("enter the array size");
8         int size=sc.nextInt();
9         int arr[]=new int[size];
10        System.out.println("enter the array elements");
11        for(int i=0;i<size;i++)
12        {
13            arr[i]=sc.nextInt();
14        }
15        sortInsertion(arr,size);
16        for(int k=0;k<size;k++)
17        {
18            System.out.print(arr[k]+" ");
19        }
20    }
21    public static void sortInsertion(int arr[],int size)
22    {
23        int current=0,j=0;
24        for(int i=0;i<size;i++)
25        {
26            current=arr[i];
27            j=i-1;
```



```
InsertSort.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help
InsertSort.java
11 for(int i=0;i<size;i++)
12 {
13     arr[i]=sc.nextInt();
14 }
15 sortInsertion(arr,size);
16 for(int k=0;k<size;k++)
17 {
18     System.out.print(arr[k]+" ");
19 }
20 }
21 public static void sortInsertion(int arr[],int size)
22 {
23     int current=0,j=0;
24     for(int i=0;i<size;i++)
25     {
26         current=arr[i];
27         j=i-1;
28         while(j>=0 && arr[j]>current)
29         {
30             arr[j+1]=arr[j];
31             j--;
32         }
33         arr[j+1]=current;
34     }
35 }
36 }
37 }
```

```
InsertSort.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help
InsertSort.java
11 for(int i=0;i<size;i++)
12 {
13     arr[i]=sc.nextInt();
14 }
15 sortInsertion(arr,size);
16 for(int k=0;k<size;k++)
17 {
18     System.out.print(arr[k]+" ");
19 }
20 }
21 public static void sortInsertion(int arr[],int size)
22 {
23     int current=0,j=0;
24     for(int i=0;i<size;i++)

PS C:\Users\Lab\Desktop\java programs\milestone1> java InsertSort
enter the array size
5
enter the array elements
6
7
4
3
5
3 4 5 6 7
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

9. Write a java program to take an input array of integers and search for a particular number given by the user. Use binary search algorithm.

```
BinSearch.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

BinSearch.java
1 import java.util.Scanner;
2 class BinSearch
3 {
4     public static void main(String args[])
5     {
6         int i, num, item, array[], first, last, middle;
7         Scanner input = new Scanner(System.in);
8         System.out.println("Enter number of elements:");
9         num = input.nextInt();
10        array = new int[num];
11        System.out.println("Enter " + num + " integers");
12        for (i=0; i<num;i++)
13            array[i] = input.nextInt();
14        System.out.println("Enter the search value:");
15        item = input.nextInt();
16        first = 0;
17        last = num - 1;
18        middle = (first+last)/2;
19        while( first <= last )
20        {
21            if (array[middle]<item)
22                first = middle + 1;
23            else if (array[middle]==item)
24            {
25                System.out.println(item + " found at location " + (middle+1) + ".");
26                break;
27            }
28        }
29    }
30 }
```

```
BinSearch.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

BinSearch.java
12        for (i=0; i<num;i++)
13            array[i] = input.nextInt();
14        System.out.println("Enter the search value:");
15        item = input.nextInt();
16        first = 0;
17        last = num - 1;
18        middle = (first+last)/2;
19        while( first <= last )
20        {
21            if (array[middle]<item)
22                first = middle + 1;
23            else if (array[middle]==item)
24            {
25                System.out.println(item + " found at location " + (middle+1) + ".");
26                break;
27            }
28            else
29            {
30                last=middle-1;
31            }
32            middle=(first+last)/2;
33        }
34        if (first>last )
35            System.out.println(item + " is not found.\n");
36    }
37 }
38 }
```

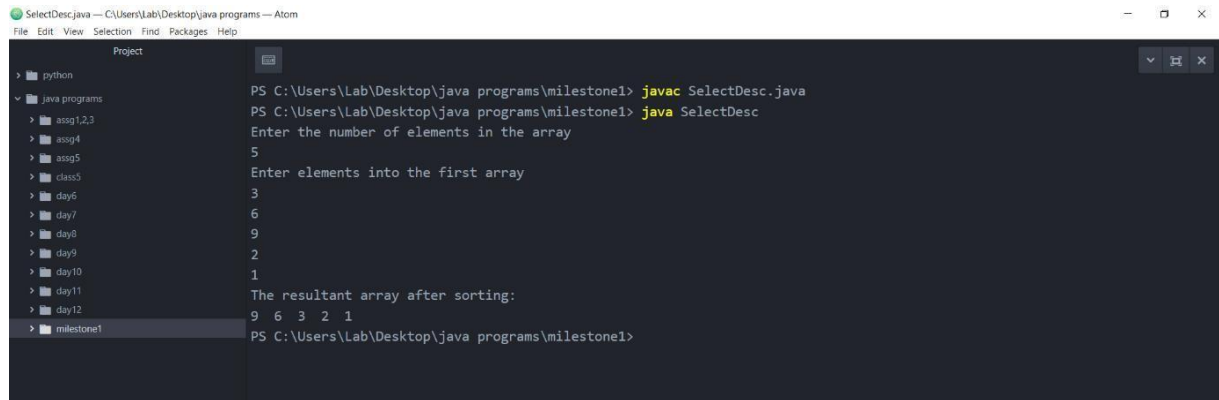
```
BinSearch.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

PS C:\Users\Lab\Desktop\java programs\milestone1> javac BinSearch.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java BinSearch
Enter number of elements:
5
Enter 5 integers
2
3
8
6
5
Enter the search value:
8
8 found at location 3.
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

10. Write a java program to take an input array of integers and sort the elements in a descending order using selection sort.

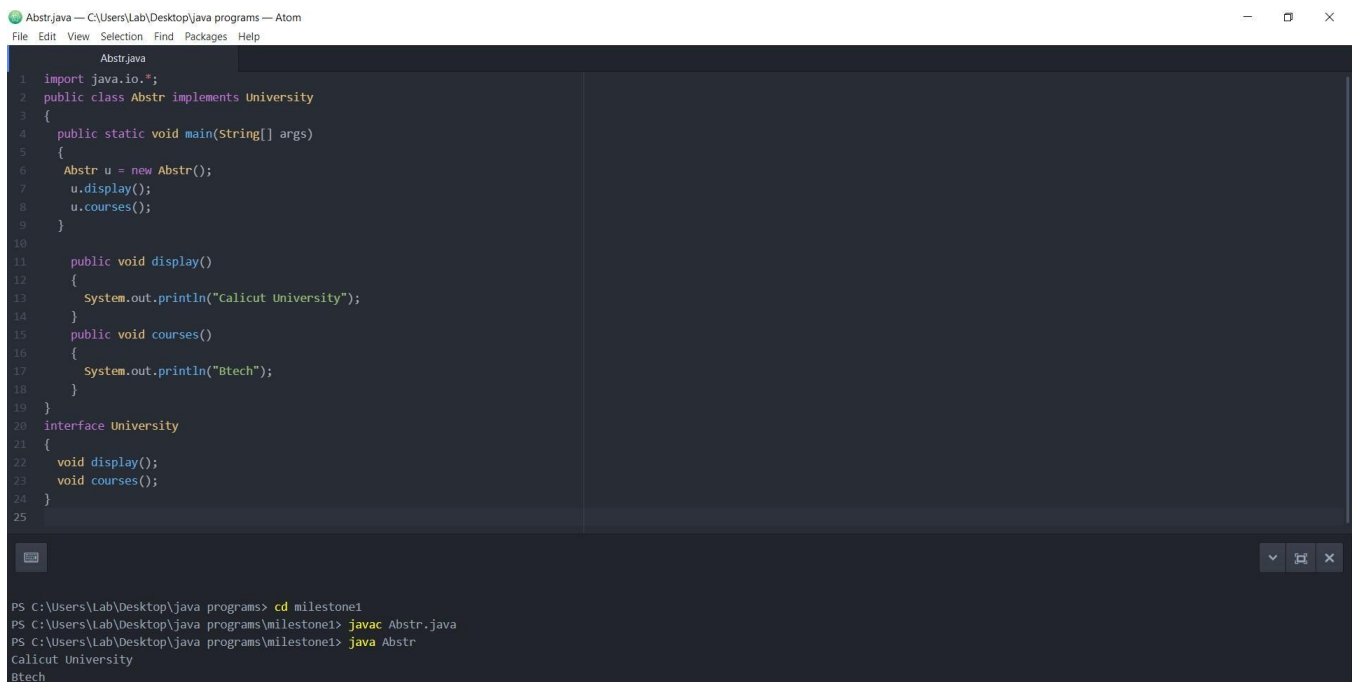
```
SelectDesc.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

SelectDesc.java
1 import java.util.*;
2 class SelectDesc
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         int n,i,j,t=0;
8         System.out.println("Enter the number of elements in the array");
9         n = sc.nextInt();
10        System.out.println("Enter elements into the first array");
11        int[] arr= new int[n];
12        for(i=0;i<n;i++)
13        {
14            arr[i] = sc.nextInt();
15        }
16        System.out.println("The resultant array after sorting: ");
17        for(i=0;i<n;i++)
18        {
19            for(j=i+1;j<n;j++)
20            {
21                if(arr[i]<arr[j])
22                {
23                    t=arr[i];
24                    arr[i]=arr[j];
25                    arr[j]=t;
26                }
27            }
28        }
29        for(i=0;i<n;i++)
30        {
31            System.out.print(arr[i]+" ");
32        }
33    }
34 }
```



```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac SelectDesc.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java SelectDesc
Enter the number of elements in the array
5
Enter elements into the first array
3
6
9
2
1
The resultant array after sorting:
9 6 3 2 1
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 11. Write a java program to achieve 100% abstraction.



```
1 import java.io.*;
2 public class Abstr implements University
3 {
4     public static void main(String[] args)
5     {
6         Abstr u = new Abstr();
7         u.display();
8         u.courses();
9     }
10
11     public void display()
12     {
13         System.out.println("Calicut University");
14     }
15     public void courses()
16     {
17         System.out.println("Btech");
18     }
19 }
20 interface University
21 {
22     void display();
23     void courses();
24 }
25
```

```
PS C:\Users\Lab\Desktop\java programs> cd milestone1
PS C:\Users\Lab\Desktop\java programs\milestone1> javac Abstr.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java Abstr
Calicut University
Btech
```

## 12. Write a java program to implement method overloading.

```
MethOver.java
1 class MethOver
2 {
3     public static void main(String[] args)
4     {
5         add(100,20);
6         sub(12.23,10,12);
7         add(10,12.5);
8         sub(20,10);
9     }
10    static void add(int a,int b)
11    {
12        System.out.println(a+b);
13    }
14    static void add(double a,double b)
15    {
16        System.out.println(a+b);
17    }
18    static void sub(int a,int b)
19    {
20        System.out.println(a-b);
21    }
22    static void sub(double a,double b)
23    {
24        System.out.println(a-b);
25    }
26 }
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> java MethOver
120
2.1100000000000001
22.5
10
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 13. Write a java program to implement method overriding.

```
MethRide.java
1 class MethRide
2 {
3     public static void main(String[] args)
4     {
5         University u = new Uoc();
6         u.display();
7         u.location();
8     }
9 }
10 class University
11 { void display()
12 {
13     System.out.println("University invoked");
14 }
15 void location()
16 {
17     System.out.println("Throughout Kerala");
18 }
19 }
20 class Uoc extends University
21 {
22     void display()
23     {
24         System.out.println("University of Calicut invoked");
25     }
26     void location()
27     {
28         System.out.println("In Malappuram");
29     }
30 }
```

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\Lab\Desktop\java programs> cd milestone1
PS C:\Users\Lab\Desktop\java programs\milestone1> javac MethRide.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java MethRide
University of Calicut invoked
In Malappuram
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 14. Write a java program to implement Hybrid Inheritance.

```
Hybrid.java
1 class C
2 {
3     public void disp()
4     {
5         System.out.println("C");
6     }
7 }
8 class A extends C
9 {
10    public void disp()
11    {
12        System.out.println("A");
13    }
14 }
15 class B extends C
16 {
17     public void disp()
18     {
19         System.out.println("B");
20     }
21 }
22 class Hybrid extends A
23 {
24     public void disp()
25     {
26         System.out.println("Hybrid Body");
27     }
28     public static void main(String args[])
29     {
30         Hybrid obj = new Hybrid();
31         obj.disp();
32     }
33 }
34
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac Hybrid.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java Hybrid
Hybrid Body
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 15. Write a java program to implement multilevel inheritance.

```
Multilevel.java
1 public class Multilevel
2 {
3     public static void main(String[] args)
4     {
5         MulC2 x= new MulC2();
6         x.disp();
7         x.disp1();
8         x.disp2();
9     }
10 }
11 class MulC
12 {
13     void disp()
14     {
15         System.out.println("This is super class");
16     }
17 }
18 class MulC1 extends MulC
19 {
20     void disp1()
21     {
22         System.out.println("This is sub class-1");
23     }
24 }
25 class MulC2 extends MulC1
26 {
27     void disp2()
28     {
29         System.out.println("This is sub class-2");
30     }
31 }
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac Multilevel.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java Multilevel
This is super class
This is sub class-1
This is sub class-2
```

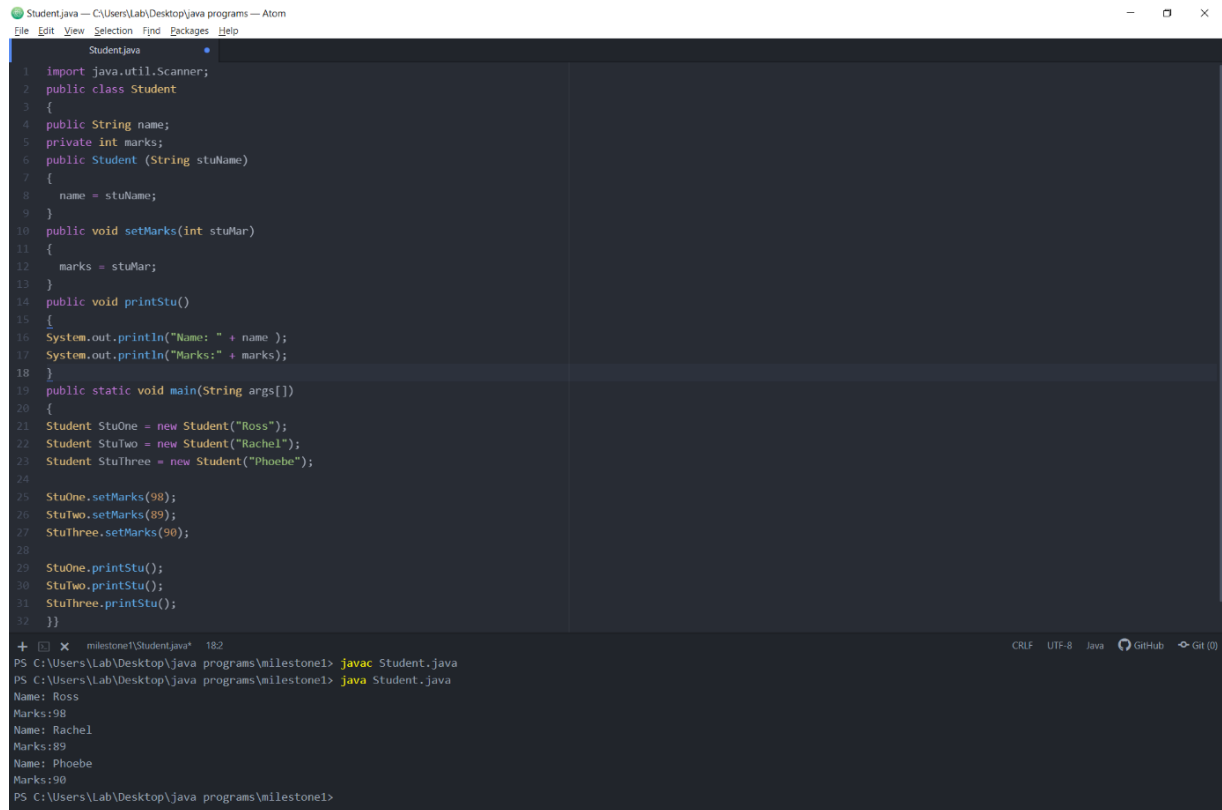
16. Write a java program to take input of integer array elements from the user and divide each element by the smallest element of the array and store the result in a resultant array. Implement Try- catch- finally block to counter null pointer divide by zero error.

```
DivSmall.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

DivSmall.java
1 import java.util.*;
2 class DivSmall
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         int n,i,min=0;
8         System.out.println("Enter the number of elements");
9         n = sc.nextInt();
10        int[] arr = new int[n];
11        int[] res = new int[n];
12        System.out.println("Enter the elements to the array");
13        for(i=0;i<n;i++)
14        {
15            arr[i] = sc.nextInt();
16        }
17        min = arr[0];
18        for(i=0;i<n;i++)
19        {
20            if(arr[i]<min)
21            {
22                min=arr[i];
23            }
24        }
25        try
26        {
27            for(i=0;i<n;i++)
28            {
29                res[i] = arr[i]/min;
30            }
31            System.out.println("Resultant array is : ");
32            System.out.println(Arrays.toString(res));
33        }
34        catch(ArithmeticException e)
35        {
36            System.out.println("Cant divide by zero");
37        }
38        catch(NullPointerException e)
39        {
40            System.out.println("NullPointerException Caught");
41        }
42        finally
43        {
44            System.out.println("The program has been executed successfully");
45        }
46    }
}
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac DivSmall.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java DivSmall
Enter the number of elements
5
Enter the elements to the array
4
2
6
8
16
Resultant array is :
[2, 1, 3, 4, 8]
The program has been executed successfully
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

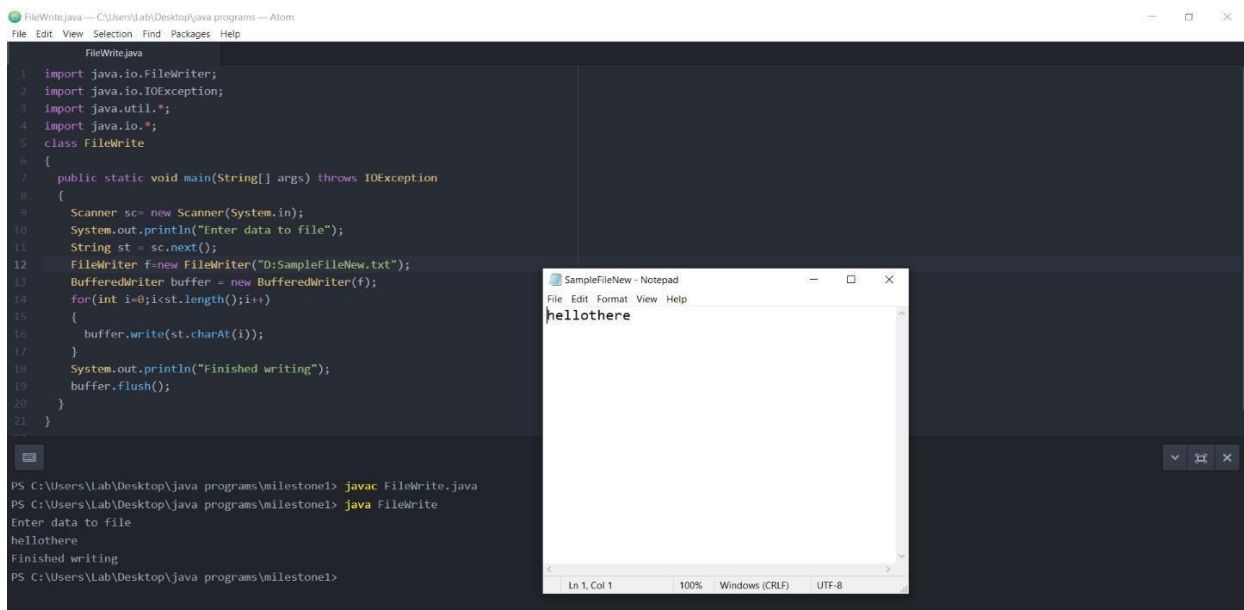
17. Write a java program to implement a constructor of the class, to print the instance variables value with respect to different objects.



```
1 import java.util.Scanner;
2 public class Student
3 {
4     public String name;
5     private int marks;
6     public Student (String stuName)
7     {
8         name = stuName;
9     }
10    public void setMarks(int stuMar)
11    {
12        marks = stuMar;
13    }
14    public void printStu()
15    {
16        System.out.println("Name: " + name );
17        System.out.println("Marks:" + marks);
18    }
19    public static void main(String args[])
20    {
21        Student StuOne = new Student("Ross");
22        Student StuTwo = new Student("Rachel");
23        Student StuThree = new Student("Phoebe");
24
25        StuOne.setMarks(98);
26        StuTwo.setMarks(89);
27        StuThree.setMarks(90);
28
29        StuOne.printStu();
30        StuTwo.printStu();
31        StuThree.printStu();
32    }
}
```

PS C:\Users\Lab\Desktop\java programs\milestone1> javac Student.java  
PS C:\Users\Lab\Desktop\java programs\milestone1> java Student.java  
Name: Ross  
Marks:98  
Name: Rachel  
Marks:89  
Name: Phoebe  
Marks:90  
PS C:\Users\Lab\Desktop\java programs\milestone1>

18. Write a java program to create a File at a particular location and to write to that particular file a String data which is taken as input from the user.



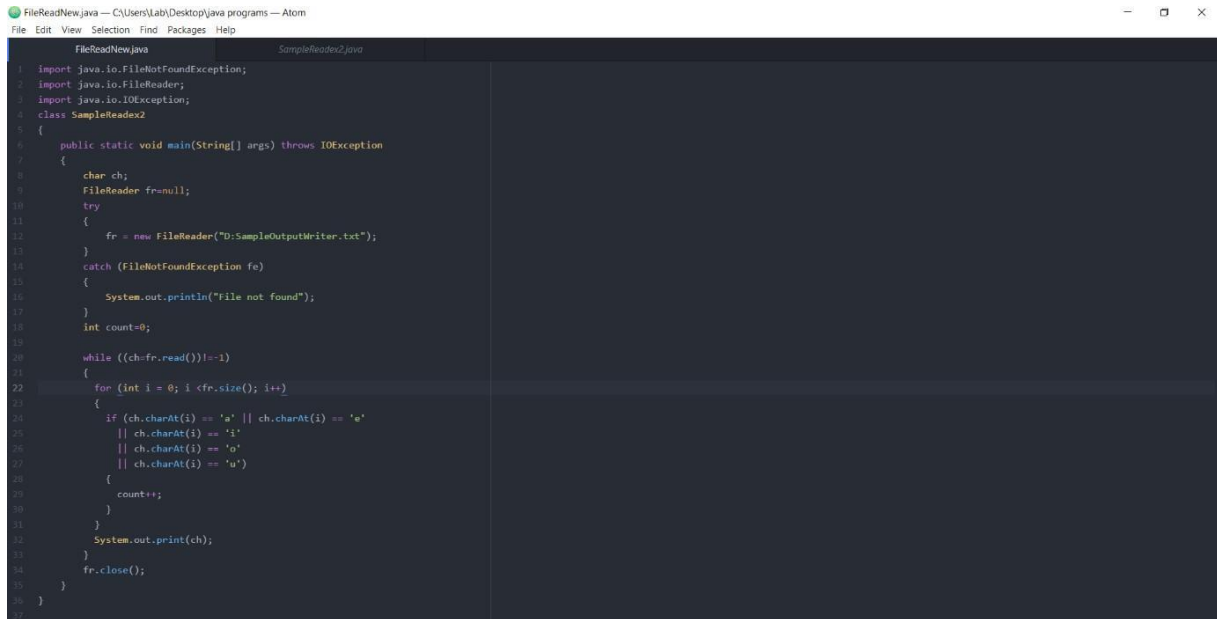
```
1 import java.io.*;
2 import java.io.IOException;
3 import java.util.*;
4 import java.io.*;
5 class FileWrite
6 {
7     public static void main(String[] args) throws IOException
8     {
9         Scanner sc= new Scanner(System.in);
10        System.out.println("Enter data to file");
11        String st = sc.next();
12        FileWriter f=new FileWriter("D:SampleFileNew.txt");
13        BufferedWriter buffer = new BufferedWriter(f);
14        for(int i=0;i<st.length();i++)
15        {
16            buffer.write(st.charAt(i));
17        }
18        System.out.println("Finished writing");
19        buffer.flush();
20    }
21 }
```

PS C:\Users\Lab\Desktop\java programs\milestone1> javac FileWrite.java  
PS C:\Users\Lab\Desktop\java programs\milestone1> java FileWrite  
Enter data to file  
hellothere  
Finished writing  
PS C:\Users\Lab\Desktop\java programs\milestone1>

SampleFileNew - Notepad  
File Edit Format View Help  
hellothere



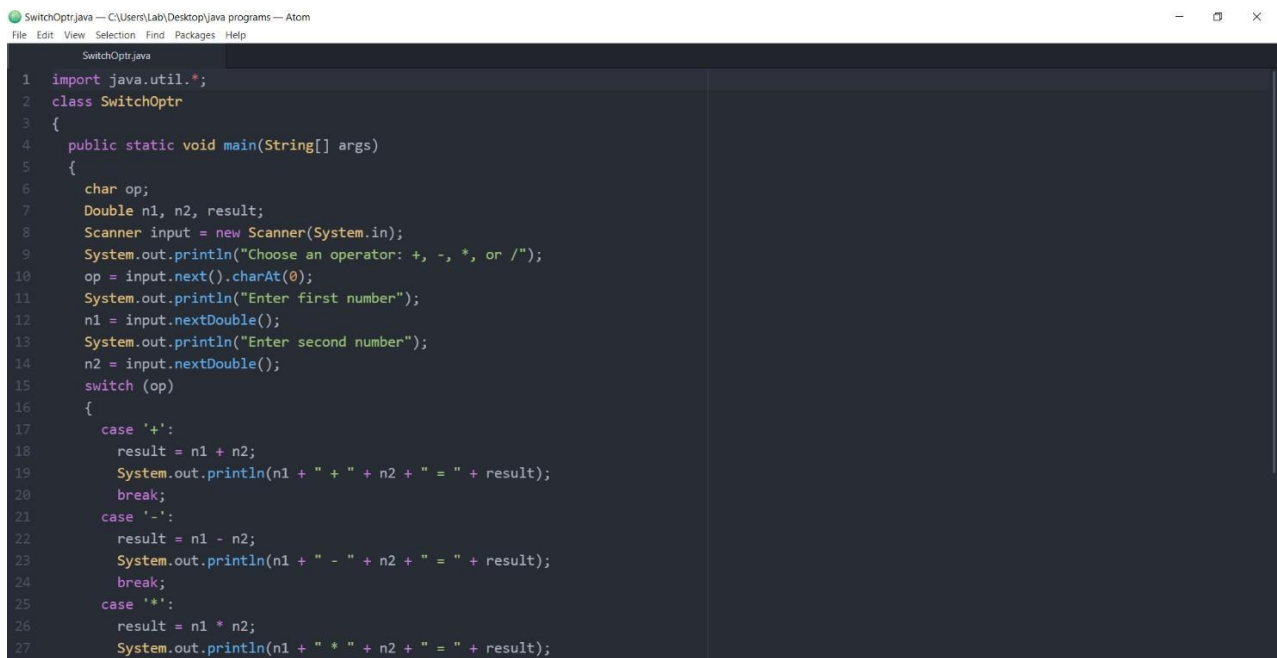
19. Write a program to read a file from a particular location and determine the number of vowels in that file.



```
FileReadNew.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

FileReadNew.java
1 import java.io.FileNotFoundException;
2 import java.io.FileReader;
3 import java.io.IOException;
4 class SampleReadex2
5 {
6     public static void main(String[] args) throws IOException
7     {
8         char ch;
9         FileReader fr=null;
10        try
11        {
12            fr = new FileReader("D:\SampleOutputWriter.txt");
13        }
14        catch (FileNotFoundException fe)
15        {
16            System.out.println("File not found");
17        }
18        int count=0;
19
20        while ((ch=fr.read())!=-1)
21        {
22            for (int i = 0; i <fr.size(); i++)
23            {
24                if (ch.charAt(i) == 'a' || ch.charAt(i) == 'e'
25                    || ch.charAt(i) == 'i'
26                    || ch.charAt(i) == 'o'
27                    || ch.charAt(i) == 'u')
28                {
29                    count++;
30                }
31            }
32            System.out.print(ch);
33        }
34        fr.close();
35    }
36 }
```

20. Write a program to take input of two numbers from the user. Now perform the particular arithmetic operation specified by the user and display the result.



```
SwitchOpTr.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

SwitchOpTr.java
1 import java.util.*;
2 class SwitchOpTr
3 {
4     public static void main(String[] args)
5     {
6         char op;
7         Double n1, n2, result;
8         Scanner input = new Scanner(System.in);
9         System.out.println("Choose an operator: +, -, *, or /");
10        op = input.next().charAt(0);
11        System.out.println("Enter first number");
12        n1 = input.nextDouble();
13        System.out.println("Enter second number");
14        n2 = input.nextDouble();
15        switch (op)
16        {
17            case '+':
18                result = n1 + n2;
19                System.out.println(n1 + " + " + n2 + " = " + result);
20                break;
21            case '-':
22                result = n1 - n2;
23                System.out.println(n1 + " - " + n2 + " = " + result);
24                break;
25            case '*':
26                result = n1 * n2;
27                System.out.println(n1 + " * " + n2 + " = " + result);
```

```

13     System.out.println("Enter second number");
14     n2 = input.nextDouble();
15     switch (op)
16     {
17         case '+':
18             result = n1 + n2;
19             System.out.println(n1 + " + " + n2 + " = " + result);
20             break;
21         case '-':
22             result = n1 - n2;
23             System.out.println(n1 + " - " + n2 + " = " + result);
24             break;
25         case '*':
26             result = n1 * n2;
27             System.out.println(n1 + " * " + n2 + " = " + result);
28             break;
29         case '/':
30             result = n1 / n2;
31             System.out.println(n1 + " / " + n2 + " = " + result);
32             break;
33         default:
34             System.out.println("Invalid operator!");
35             break;
36     }
37 }
38 }

```

```

Enter first number
Enter second number
3
2.0 + 3.0 = 5.0
PS C:\Users\Lab\Desktop\java programs\milestone1> java SwitchOpTr
Choose an operator: +, -, *, or /
-
Enter first number
4
Enter second number
2
4.0 - 2.0 = 2.0
PS C:\Users\Lab\Desktop\java programs\milestone1> java SwitchOpTr
Choose an operator: +, -, *, or /
*
Enter first number
6
Enter second number
1
6.0 * 1.0 = 6.0
PS C:\Users\Lab\Desktop\java programs\milestone1> java SwitchOpTr
Choose an operator: +, -, *, or /
/
Enter first number
8
Enter second number
2
8.0 / 2.0 = 4.0

```

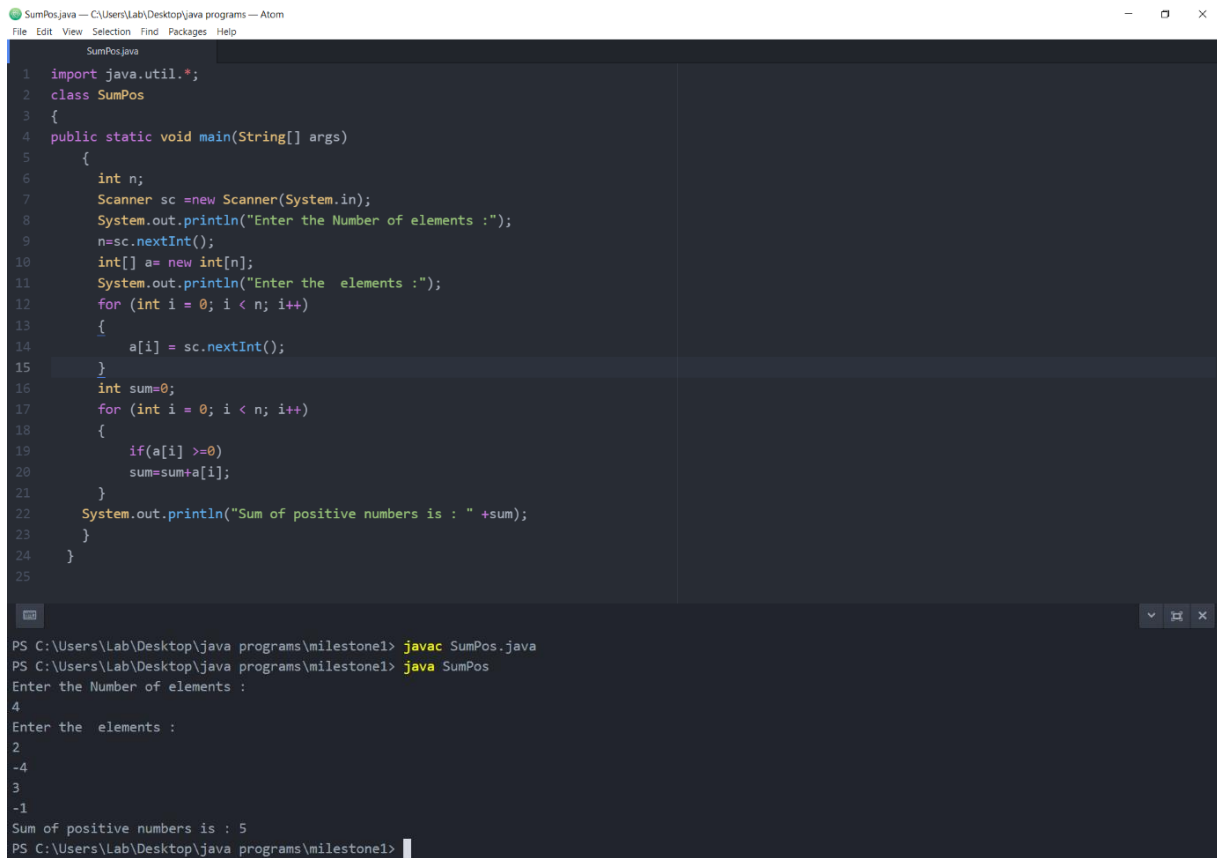
## 21. Create an array of 10 elements and print them using the for each loop.

```
ForEach.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

ForEach.java
1 import java.util.*;
2 class ForEach
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         int[] arr = new int[10];
8         System.out.println("Enter 10 elements");
9         for (int i=0;i<10 ;i++ )
10        {
11            arr[i] = sc.nextInt();
12        }
13        for(int i:arr)
14        {
15            System.out.print(i+" ");
16        }
17    }
18 }
19
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> java ForEach
Enter 10 elements
2
4
5
6
7
8
9
2
10
12
2 4 5 6 7 8 9 2 10 12
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 22. Take the number input from the console and add all the positive numbers. (Not to consider the negative number if entered).



The screenshot shows an IDE window titled "SumPos.java" with the following code:

```
1 import java.util.*;
2 class SumPos
3 {
4     public static void main(String[] args)
5     {
6         int n;
7         Scanner sc = new Scanner(System.in);
8         System.out.println("Enter the Number of elements :");
9         n = sc.nextInt();
10        int[] a = new int[n];
11        System.out.println("Enter the elements :");
12        for (int i = 0; i < n; i++)
13        {
14            a[i] = sc.nextInt();
15        }
16        int sum = 0;
17        for (int i = 0; i < n; i++)
18        {
19            if(a[i] >= 0)
20                sum = sum + a[i];
21        }
22        System.out.println("Sum of positive numbers is : " + sum);
23    }
24 }
25
```

The output console shows the following execution:

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac SumPos.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java SumPos
Enter the Number of elements :
4
Enter the elements :
2
-4
3
-1
Sum of positive numbers is : 5
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 23. Create a labelled break and write a simple logic and execute the program.



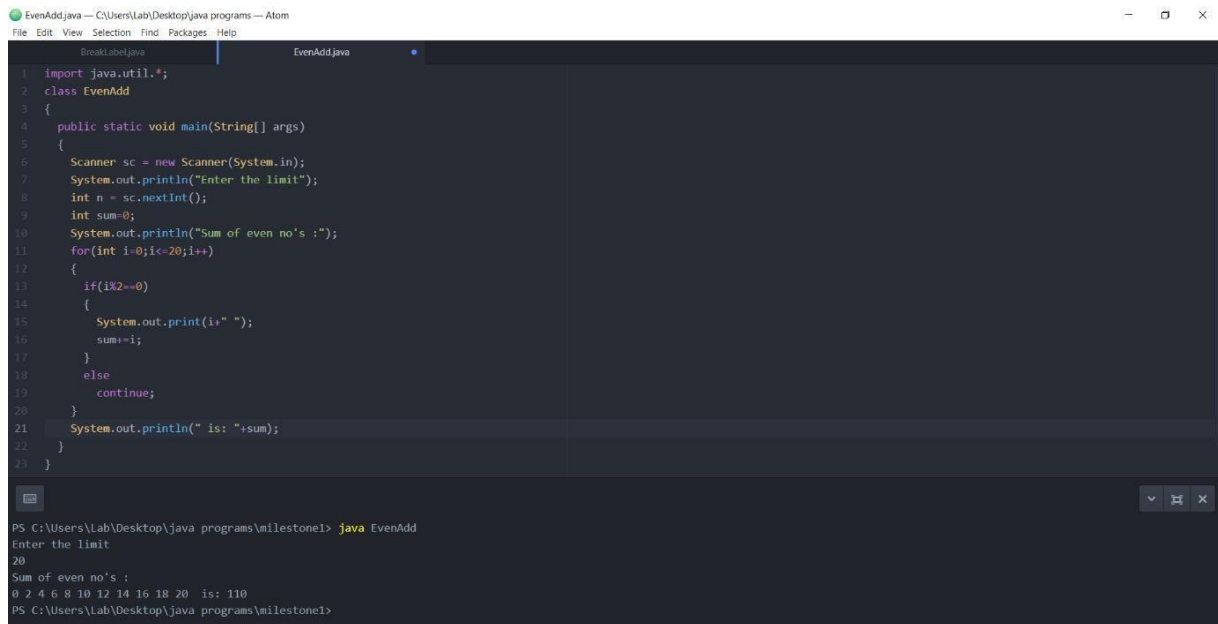
The screenshot shows an IDE window titled "BreakLabel.java" with the following code:

```
1 class BreakLabel
2 {
3     public static void main(String[] args)
4     {
5         int i = 10;
6         loop1:
7         while(i < 20)
8         {
9             if(i == 15)
10                break loop1;
11            System.out.println("i =" + i);
12            i++;
13        }
14        System.out.println("Out of the loop");
15    }
16 }
17
```

The output console shows the following execution:

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac BreakLabel.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java BreakLabel
i =10
i =11
i =12
i =13
i =14
Out of the loop
```

## 24. Do the addition of around 10 even numbers, but use the continue statement in the logic.



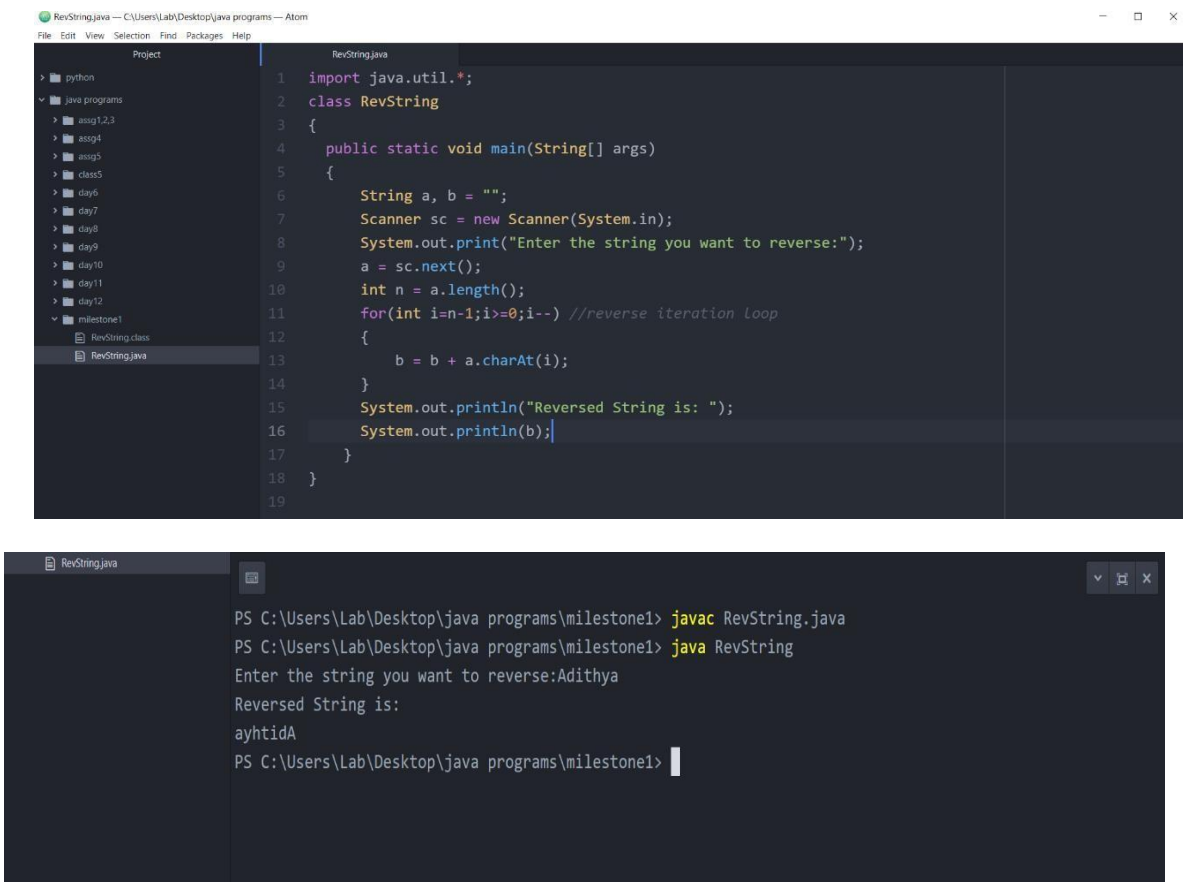
The screenshot shows the Atom IDE with a file named `EvenAdd.java` open. The code is as follows:

```
1 import java.util.*;
2 class EvenAdd
3 {
4     public static void main(String[] args)
5     {
6         Scanner sc = new Scanner(System.in);
7         System.out.println("Enter the limit");
8         int n = sc.nextInt();
9         int sum=0;
10        System.out.println("Sum of even no's :");
11        for(int i=0;i<=20;i++)
12        {
13            if(i%2!=0)
14            {
15                System.out.print(i+" ");
16                sum+=i;
17            }
18            else
19                continue;
20        }
21        System.out.println(" is: "+sum);
22    }
23 }
```

Below the code editor, the terminal output is shown:

```
PS C:\Users\Lab\Desktop\java programs\milestone1> java EvenAdd
Enter the limit
20
Sum of even no's :
0 2 4 6 8 10 12 14 16 18 20 is: 110
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 25. Write a program to reverse the String (use char [] or String built in method)



The screenshot shows the Atom IDE with a file named `RevString.java` open. The code is as follows:

```
1 import java.util.*;
2 class RevString
3 {
4     public static void main(String[] args)
5     {
6         String a, b = "";
7         Scanner sc = new Scanner(System.in);
8         System.out.print("Enter the string you want to reverse:");
9         a = sc.next();
10        int n = a.length();
11        for(int i=n-1;i>=0;i--) //reverse iteration loop
12        {
13            b = b + a.charAt(i);
14        }
15        System.out.println("Reversed String is: ");
16        System.out.println(b);
17    }
18 }
19 }
```

Below the code editor, the terminal output is shown:

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac RevString.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java RevString
Enter the string you want to reverse:Adithya
Reversed String is:
ayhtidA
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

**26. Write programs to depict the usage of contains (), length (), replace (), concat (), equals ().**

```
Stringops.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

Stringops.java
1 class Stringops
2 {
3     public static void main(String[] args)
4     {
5         String s1= "Hello";
6         String s2= "Hello";
7         System.out.println(s1.contains("el"));
8         System.out.println(s1.length());
9         System.out.println(s1.concat(s2));
10        System.out.println(s1.replace('H','c'));
11        System.out.println(s1.equals(s2));
12    }
13 }
14

PS C:\Users\Lab\Desktop\java programs\milestone1> java Stringops
true
5
HelloHello
cello
true
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

**27. Create an inheritance class. (Super class as Vehicle and 2 subclasses Car and Bike and inherit the Vehicle class methods)**

```
1 public class VehicleProgram
2 {
3     public static void main(String[] args)
4     {
5         Car x= new Car();
6         x.drive();
7         x.drive2();
8         System.out.println();
9         Bike b = new Bike();
10        b.drive();
11        b.drive1();
12    }
13 }
14 class Vehicle
15 {
16     void drive()
17     {
18         System.out.println("This is Vehicle");
19     }
20 }
21 class Bike extends Vehicle
22 {
23     void drive1()
24     {
25         System.out.println("This is Bike");
26     }
27 }
28 class Car extends Vehicle
29 {
30     void drive2()
31     {
32         System.out.println("This is Car");
33     }
34 }
35 }
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac VehicleProgram.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java VehicleProgram
This is Vehicle
This is Car

This is Vehicle
This is Bike
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 28. Depict programmatically the Method overloading and Method overriding concepts.

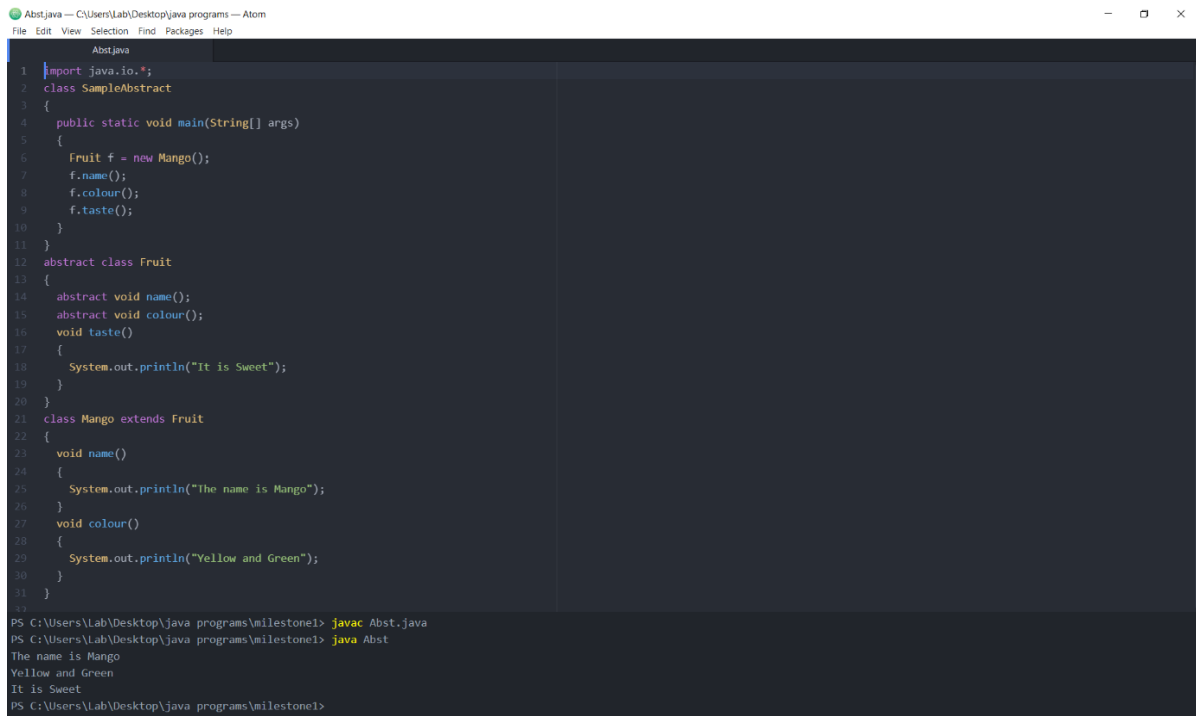
MethOL.java — C:\Users\Lab\Desktop\java programs — Atom

```
File Edit View Selection Find Packages Help

MethOL.java
1  class MethOL
2  {
3      public static void main(String[] args)
4      {
5          add(100,20);
6          add(10,12.5);
7          University u = new Uoc();
8          u.display();
9          u.location();
10     }
11     static class University
12     { static void display()
13       {
14         System.out.println("University invoked");
15       }
16       static void location()
17       {
18         System.out.println("Throughout Kerala");
19       }
20     }
21     static class Uoc extends University
22     {
23     static void display()
24     {
25         System.out.println("University of Calicut invoked");
26     }
27     static void location()
28     {
29         System.out.println("In Malappuram");
30     }
31     }
32
33     static void add(int a,int b)
34     {
35         System.out.println(a+b);
36     }
37     static void add(double a,double b)
38     {
39         System.out.println(a+b);
40     }
41     }
```

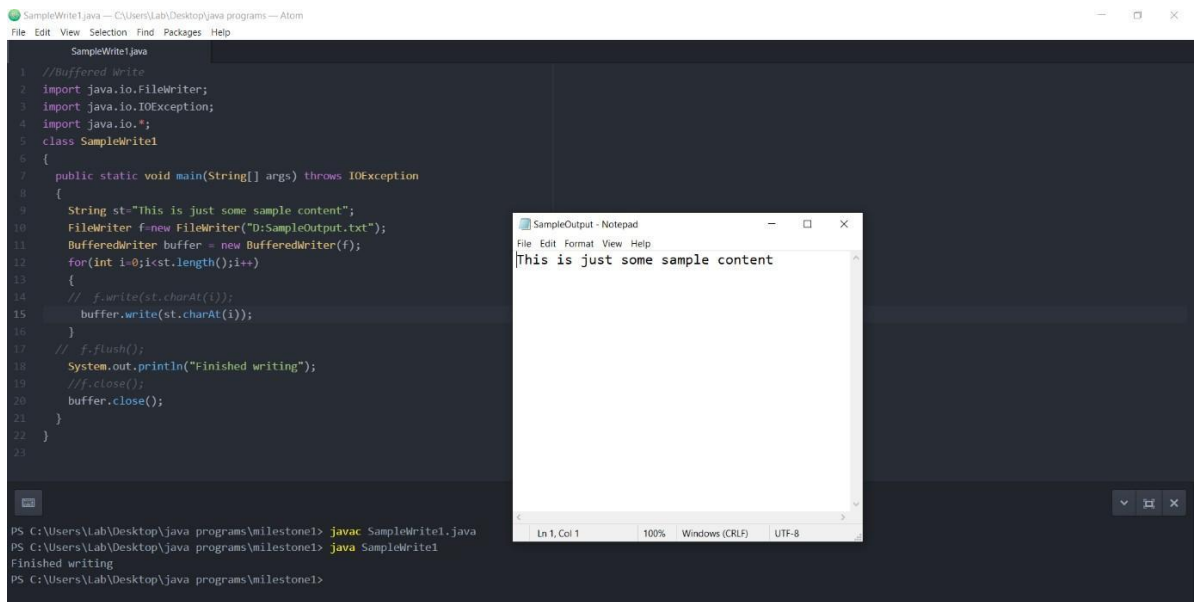
```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac MethOL.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java MethOL
120
22.5
University invoked
Throughout Kerala
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 29. Create an abstract class and extend that class and try to create the object of the abstract class in a program and execute.



```
Abst.java
1 import java.io.*;
2 class SampleAbstract
3 {
4     public static void main(String[] args)
5     {
6         Fruit f = new Mango();
7         f.name();
8         f.colour();
9         f.taste();
10    }
11 }
12 abstract class Fruit
13 {
14     abstract void name();
15     abstract void colour();
16     void taste()
17     {
18         System.out.println("It is Sweet");
19     }
20 }
21 class Mango extends Fruit
22 {
23     void name()
24     {
25         System.out.println("The name is Mango");
26     }
27     void colour()
28     {
29         System.out.println("Yellow and Green");
30     }
31 }
32 }
PS C:\Users\Lab\Desktop\java programs\milestone1> javac Abst.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java Abst
The name is Mango
Yellow and Green
It is Sweet
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

## 30. Write a java program to write the data into a file and read back using FileOutputStream/FileInputStream and also try the same using the BufferedReader and BufferedWriter.



```
SampleWrite1.java
1 //Buffered write
2 import java.io.*;
3 import java.io.IOException;
4 import java.io.*;
5 class SampleWrite1
6 {
7     public static void main(String[] args) throws IOException
8     {
9         String st="This is just some sample content";
10        FileWriter f=new FileWriter("D:\\SampleOutput.txt");
11        BufferedWriter buffer = new BufferedWriter(f);
12        for(int i=0;i<st.length();i++)
13        {
14            // f.write(st.charAt(i));
15            buffer.write(st.charAt(i));
16        }
17        // f.flush();
18        System.out.println("Finished writing");
19        //f.close();
20        buffer.close();
21    }
22 }
23 }
PS C:\Users\Lab\Desktop\java programs\milestone1> javac SampleWrite1.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java SampleWrite1
Finished writing
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

SampleOutput - Notepad

This is just some sample content



```
SampRead.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

SampRead.java
1 import java.io.IOException;
2 import java.io.FileReader;
3 import java.io.FileNotFoundException;
4 import java.io.File;
5 import java.util.*;
6 class SampRead
7 {
8     public static void main(String[] args) throws IOException
9     {
10         File file1=new File("D:SampleOutput.txt");
11         int len=(int) file1.length();
12         try
13         {
14             FileReader fr=new FileReader(file1);
15             char[] x=new char[len];
16             fr.read(x);
17             String filecontent=new String(x);
18             System.out.println(filecontent);
19             int count = 0;
20         }
21         catch(FileNotFoundException e)
22         {
23             System.out.println("File not found");
24         }
25         catch(Exception e)
26         {
27             System.out.println(e);
28         }
29     }
30 }
31 }

PS C:\Users\Lab\Desktop\java programs\milestone1> javac SampRead.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java SampRead
File not found
PS C:\Users\Lab\Desktop\java programs\milestone1> java SampRead
File not found
PS C:\Users\Lab\Desktop\java programs\milestone1> javac SampRead.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java SampRead
This is just some sample content
PS C:\Users\Lab\Desktop\java programs\milestone1> 
```

### 32. Write a java program to copy data from one file to another file.

```
CopyFile.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

CopyFile.java
1 import java.io.*;
2 import java.io.FileInputStream;
3 import java.io.FileOutputStream;
4 import java.io.IOException;
5 public class CopyFile
6 {
7     public static void main(String[] args)
8     {
9         FileInputStream instream = null;
10        FileOutputStream outstream = null;
11        try{
12            File infile =new File("D:SampleOutput.txt");
13            File outfile =new File("D:Sample.txt");
14
15            instream = new FileInputStream(infile);
16            outstream = new FileOutputStream(outfile);
17
18            byte[] buffer = new byte[1024];
19
20            int length;
21            while ((length = instream.read(buffer)) > 0)
22            {
23                outstream.write(buffer, 0, length);
24            }
25            instream.close();
26            outstream.close();
27            System.out.println("File copied successfully!!");
28        }
29        catch(IOException e)
30        {
31            e.printStackTrace();
32        }
33    }
34 }

PS C:\Users\Lab\Desktop\java programs\milestone1> java CopyFile
File copied successfully!!
PS C:\Users\Lab\Desktop\java programs\milestone1> 
```

Sample - Notepad

File Edit Format View Help

This is just some sample content

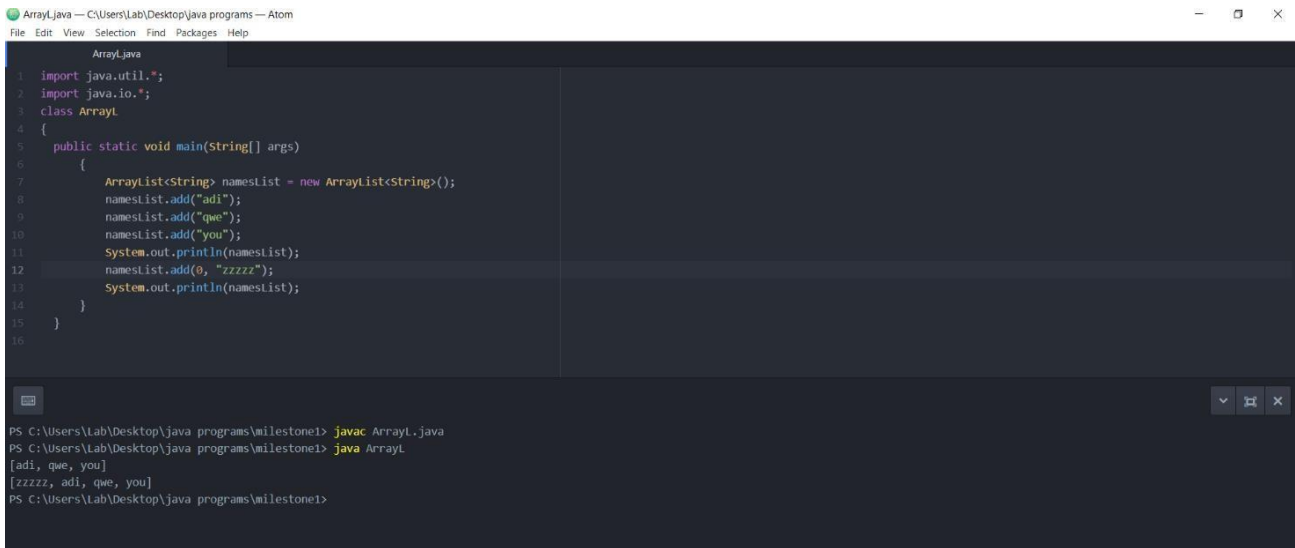
Sample - Notepad

File Edit Format View Help

This is just some sample content

Ln 1, Col 1 100% Windows (CRLF) UTF-8

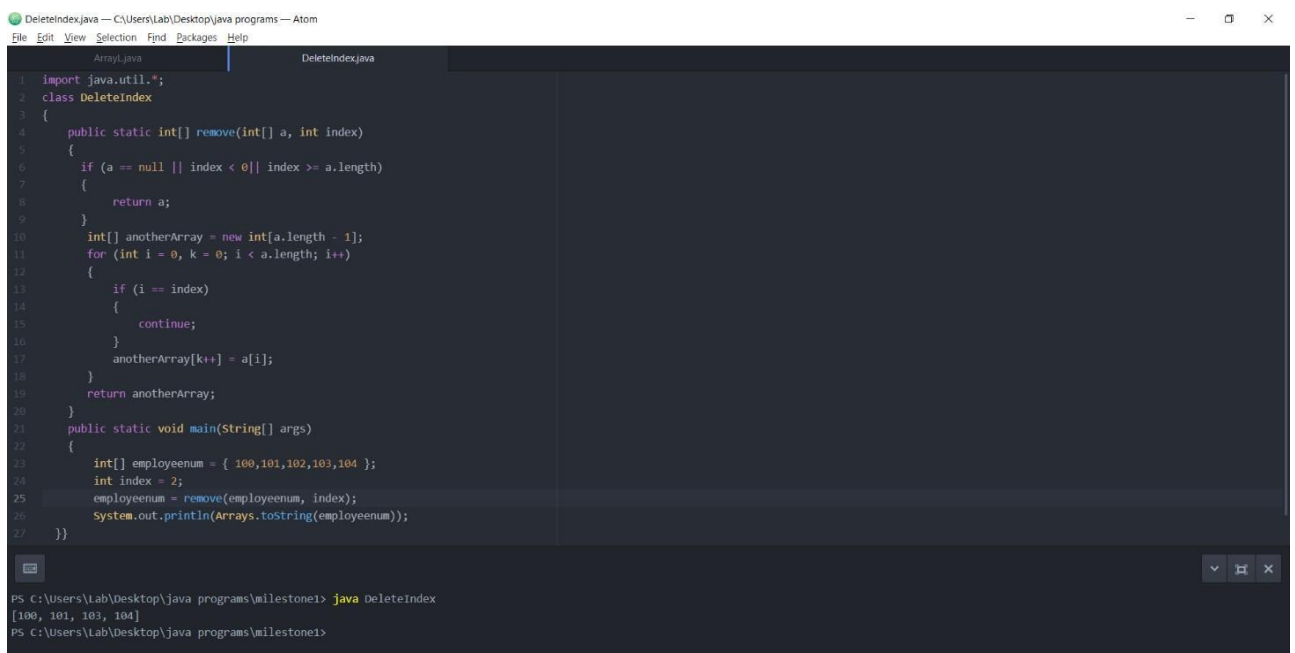
### 33. How to add an element at a specific position in an ArrayList (create using <>)



```
ArrayL.java
1 import java.util.*;
2 import java.io.*;
3 class ArrayL
4 {
5     public static void main(String[] args)
6     {
7         ArrayList<String> namesList = new ArrayList<String>();
8         namesList.add("adi");
9         namesList.add("qwe");
10        namesList.add("you");
11        System.out.println(namesList);
12        namesList.add(0, "zzzzz");
13        System.out.println(namesList);
14    }
15 }
16
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> javac ArrayL.java
PS C:\Users\Lab\Desktop\java programs\milestone1> java ArrayL
[adi, qwe, you]
[zzzzz, adi, qwe, you]
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

### 34. Create an array of employee objects and iterate through it and remove the object at the 2nd position.



```
DeleteIndex.java
1 import java.util.*;
2 class DeleteIndex
3 {
4     public static int[] remove(int[] a, int index)
5     {
6         if (a == null || index < 0 || index >= a.length)
7         {
8             return a;
9         }
10        int[] anotherArray = new int[a.length - 1];
11        for (int i = 0, k = 0; i < a.length; i++)
12        {
13            if (i == index)
14            {
15                continue;
16            }
17            anotherArray[k++] = a[i];
18        }
19        return anotherArray;
20    }
21    public static void main(String[] args)
22    {
23        int[] employeeenum = { 100,101,102,103,104 };
24        int index = 2;
25        employeeenum = remove(employeeenum, index);
26        System.out.println(Arrays.toString(employeeenum));
27    }
28 }
```

```
PS C:\Users\Lab\Desktop\java programs\milestone1> java DeleteIndex
[100, 101, 103, 104]
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

==