



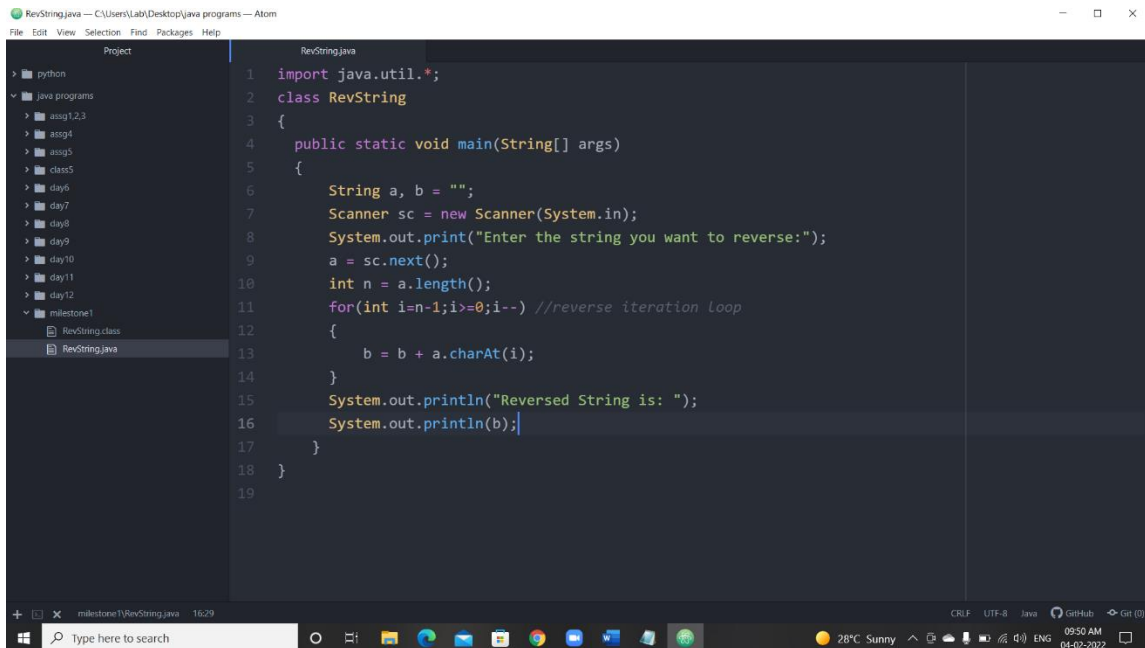
MILESTONE - 1

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Milestone: -1

Adithya K Prabhu – 211480

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



The screenshot shows the Atom code 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 indicates the file is 'RevString.java' and the time is 16:29.



The screenshot shows a terminal window with the following 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>
```

- 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:

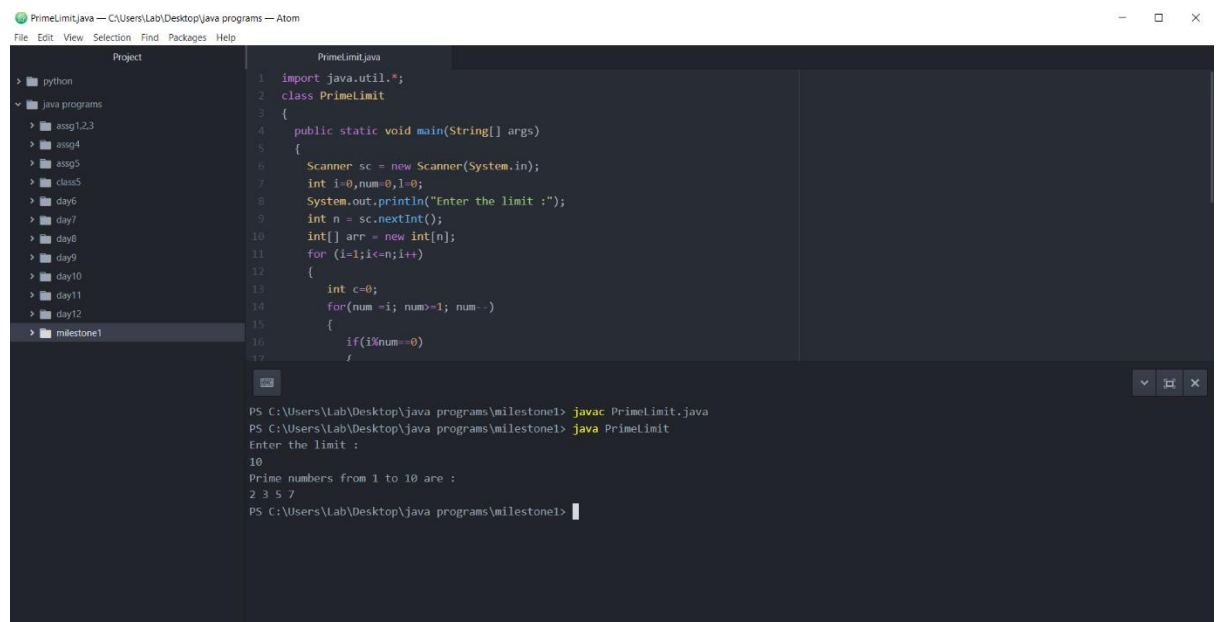
1,2,3,5,7



```

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[l] = 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     }

```



```

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.

```

PallinString.java — 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
      > PallinString.class
      > PallinString.java
      > PrimeLimit.class
      > PrimeLimit.java
      > RevString.class
      > RevString.java

PallinString.java
1  import java.util.*;
2  class PallinString
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 }

Enter the string you want to check:malayalam
The string malayalam is a palindrome.
PS C:\Users\Lab\Desktop\java programs\milestone1> java PallinString
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.

```

DuplString.java — C:\Users\Lab\Desktop\java programs — Atom
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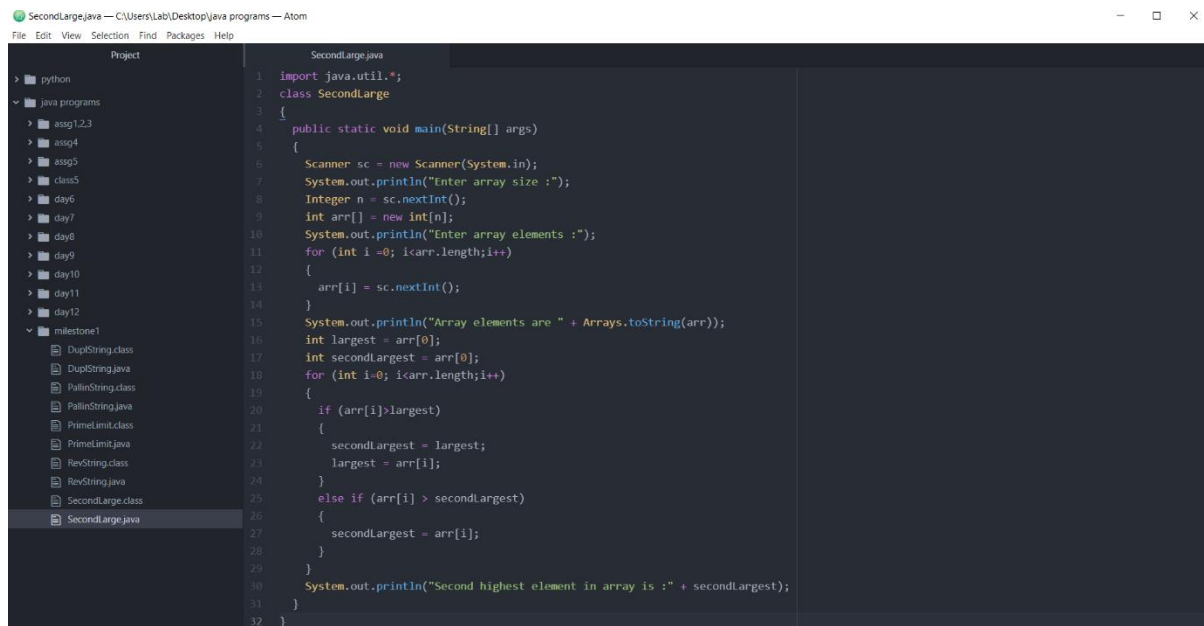
Project
  > python
  > java programs
    > assg1,2,3
    > assg4
    > assg5
    > class5
    > day6
    > day7
    > day8
    > day9
    > day10
    > day11
    > day12
    > assg12
    > BinarySearch.java
    > InsertionSort.class
    > InsertionSort.java
    > LinearSearch.java
    > milestone1

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         }
25     }
26 }

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.

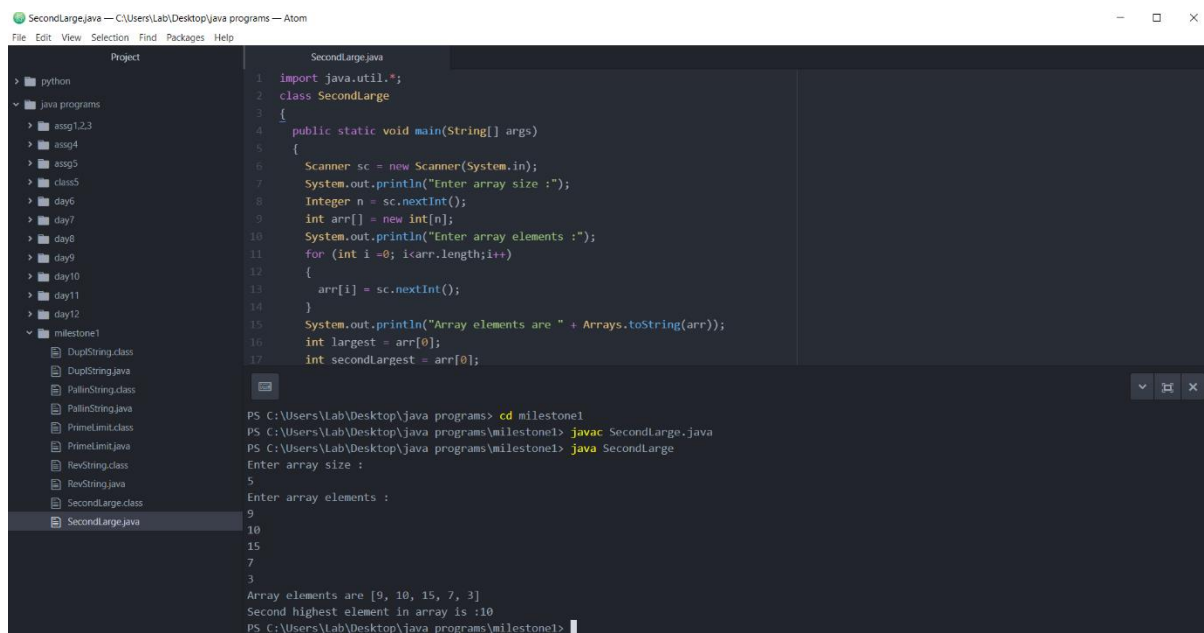


The screenshot shows an IDE window titled "SecondLarge.java - C:\Users\Lab\Desktop\java programs - Atom". The code is as follows:

```

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 with the code from the previous screenshot. Below the code editor, the terminal output is visible:

```

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.

```

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 }

```

```
MatSub.java — 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
    DuplString.class
    DuplString.java
    MatSub.class
    MatSub.java
    PalinString.class
    PalinString.java
    PrimeLimit.class
    PrimeLimit.java
    RevString.class
    RevString.java
    SecondLarge.class
    SecondLarge.java

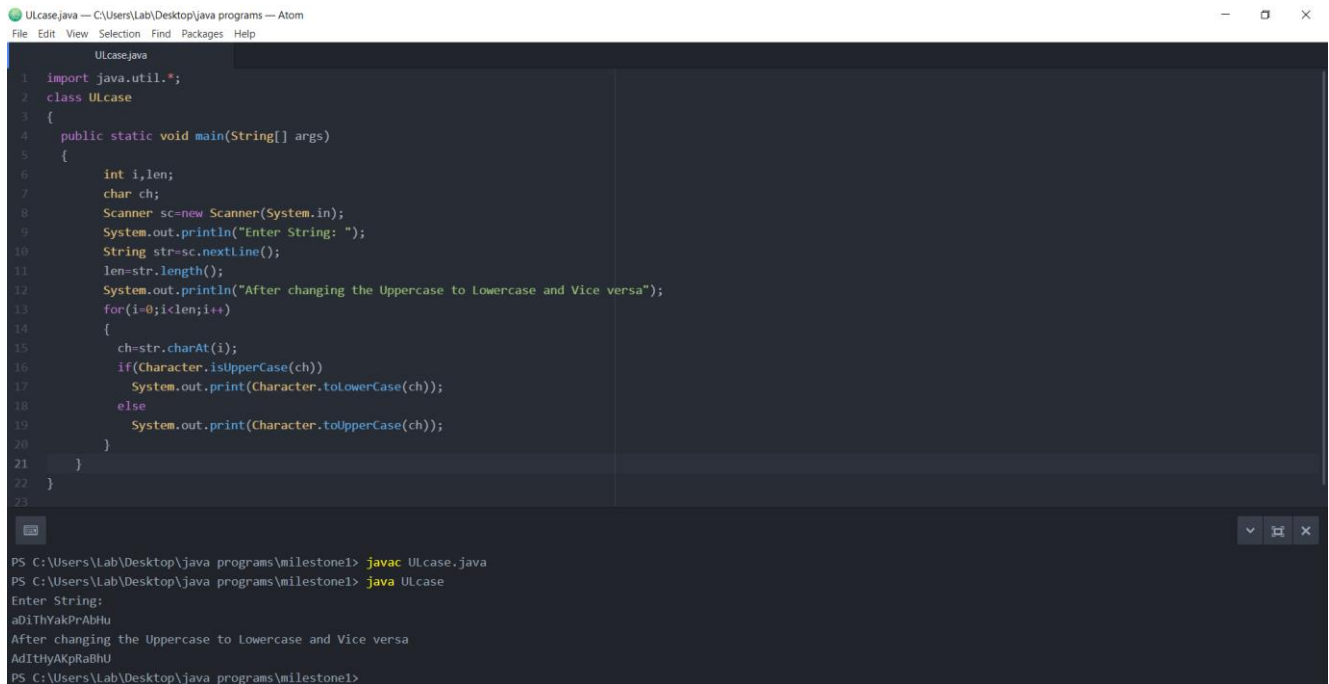
PS C:\Users\Lab\Desktop\java programs\milestone1> java MatSub
Enter the value of row and column size of the matrix
3
3
Enter the values of the first matrix
6
7
8
9
8
6
7
First Matrix :
6 7 8
9 8 7
6 5 9
Enter the values of the second matrix
1
2
3
4
3

MatSub.java — 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
    DuplString.class
    DuplString.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
2
5
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
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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>
```

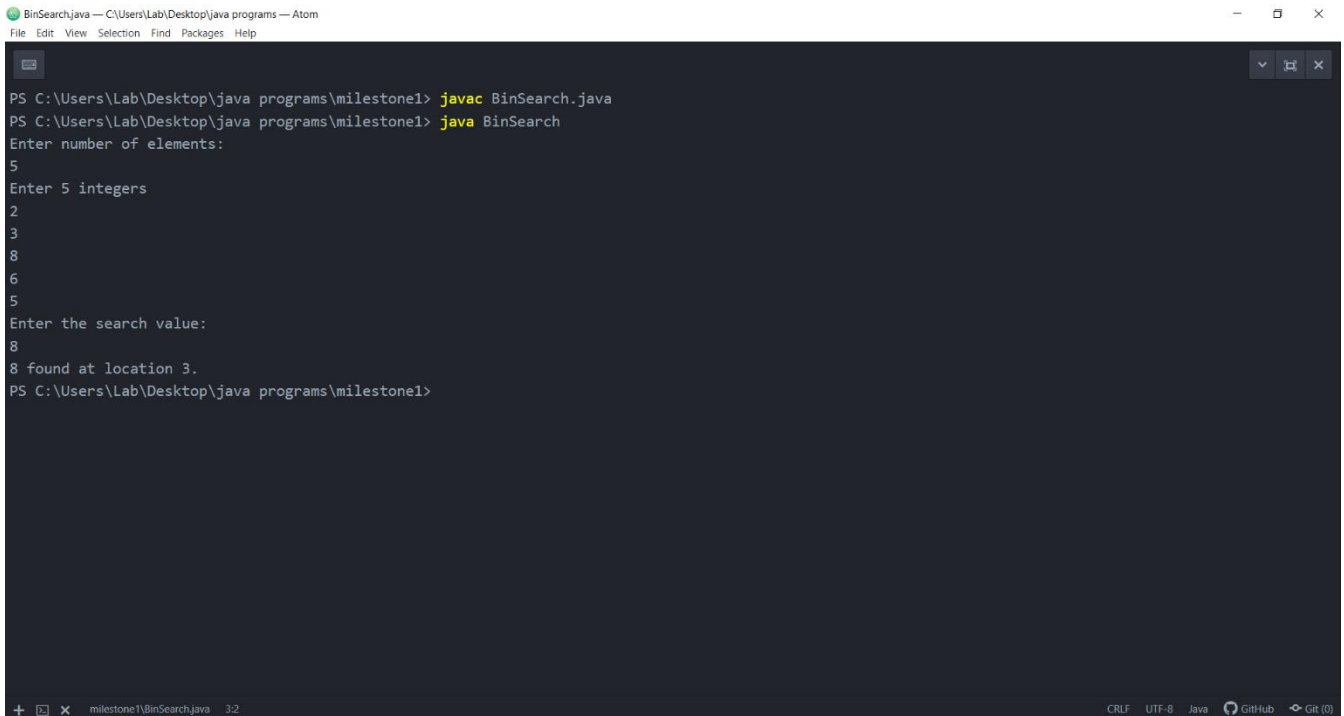
9. Write a java program to take an input array of integers and search for a particular number given by the user. Use binary search algorithm.

```
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

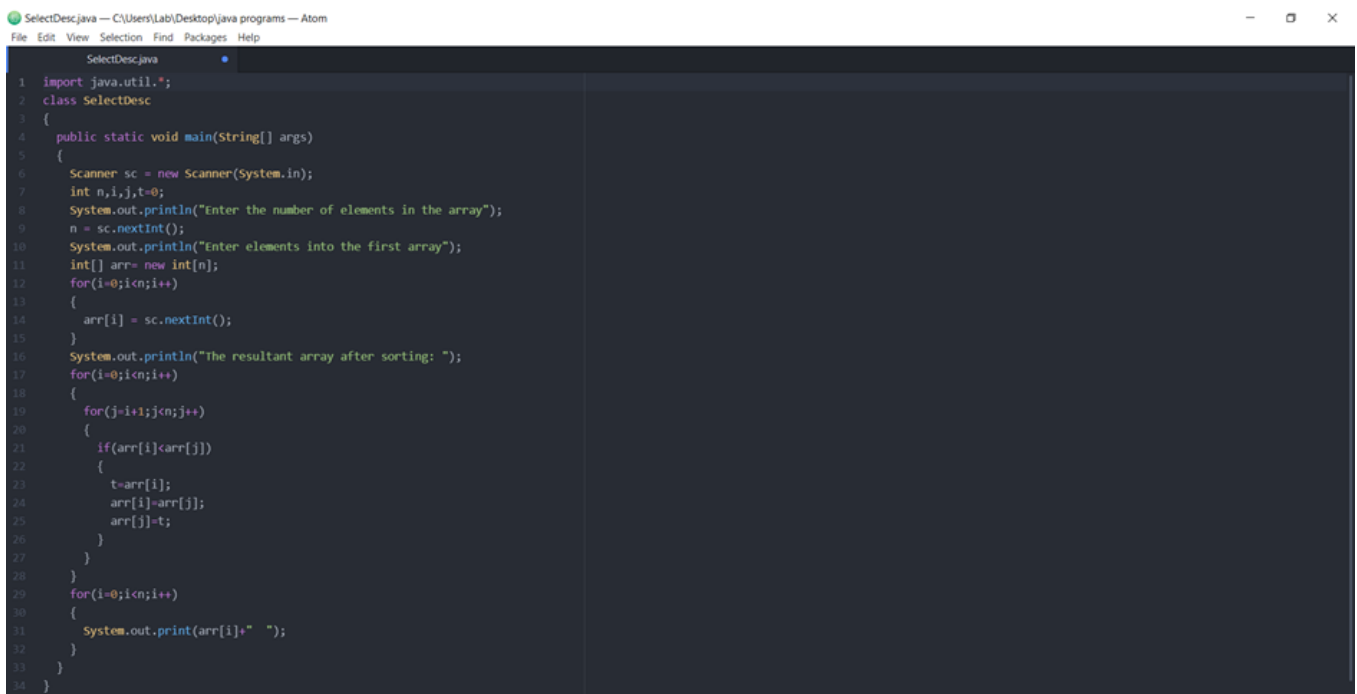
BinSearch.java
12        for (i=0; i<num;i++)
13            array[i] = input.nextInt();
14        System.out.println("Enter the search value:");
15        item = input.nextInt();
16        first = 0;
17        last = num - 1;
18        middle = (first+last)/2;
19        while( first <= last )
20        {
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 }
```



The screenshot shows a Java IDE window titled "BinSearch.java". The code is being executed in a command prompt. The output shows the user entering 5 elements, then 5 integers (2, 3, 8, 6, 5), and then the search value 8. The program finds the value 8 at location 3.

```
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.



The screenshot shows a Java IDE window titled "SelectDesc.java". The code is for a selection sort program that sorts an array of integers in descending order. The code includes imports, class definition, main method, and the sorting logic using nested loops and a temporary variable for swapping.

```
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 }
```

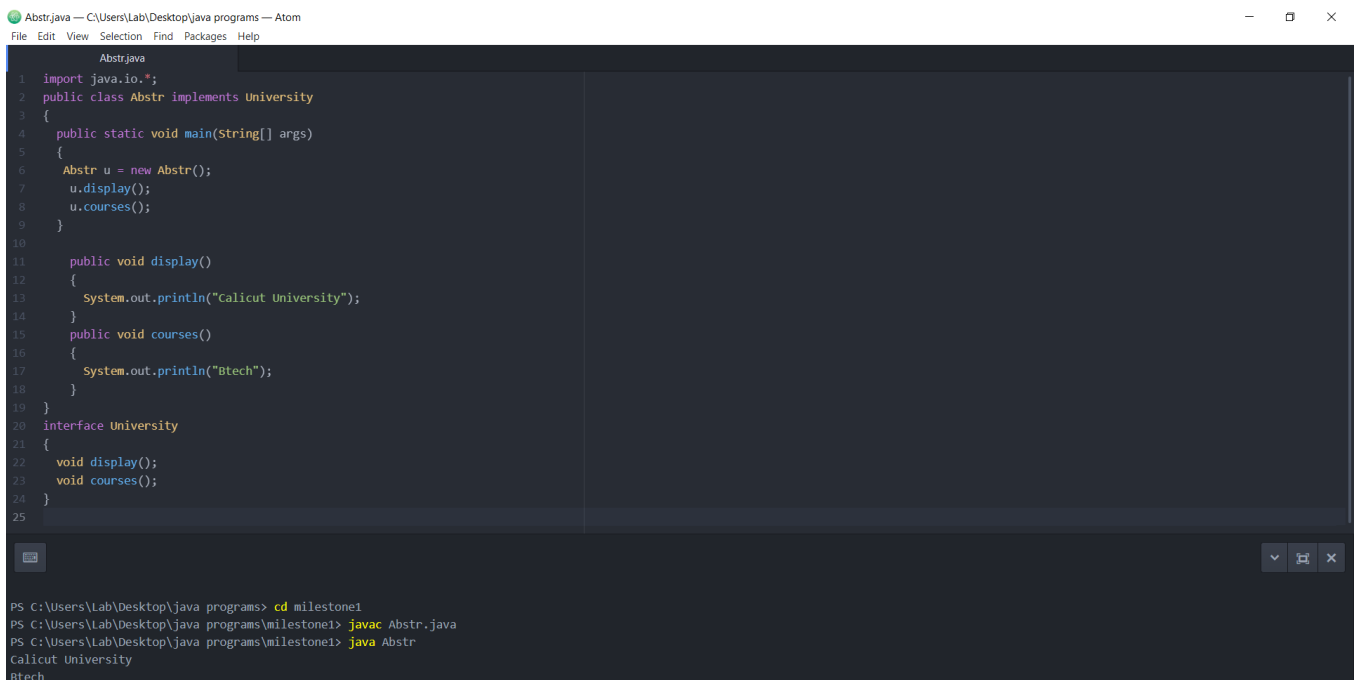


```
SelectDesc.java — C:\Users\Lab\Desktop\java programs — Atom
File Edit View Selection Find Packages Help

Project
> python
> java programs
  > assg1,2,3
  > assg4
  > assg5
  > class5
  > day6
  > day7
  > day8
  > day9
  > day10
  > day11
  > day12
  > milestone1

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.



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

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

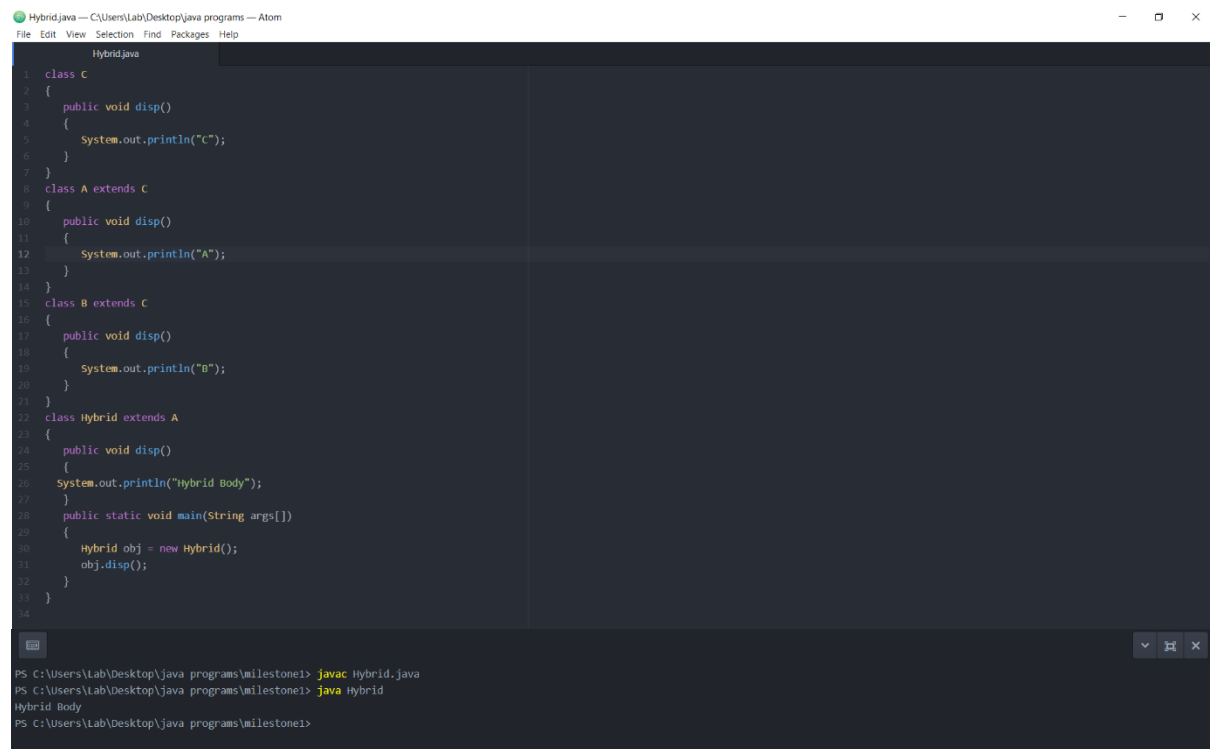
MethRide.java
1 class MethRide
2 {
3     public static void main(String[] args)
4     {
5         University u = new Uoc();
6         u.display();
7         u.location();
8     }
9 }
10 class University
11 { void display()
12 {
13     System.out.println("University invoked");
14 }
15 void location()
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>
```

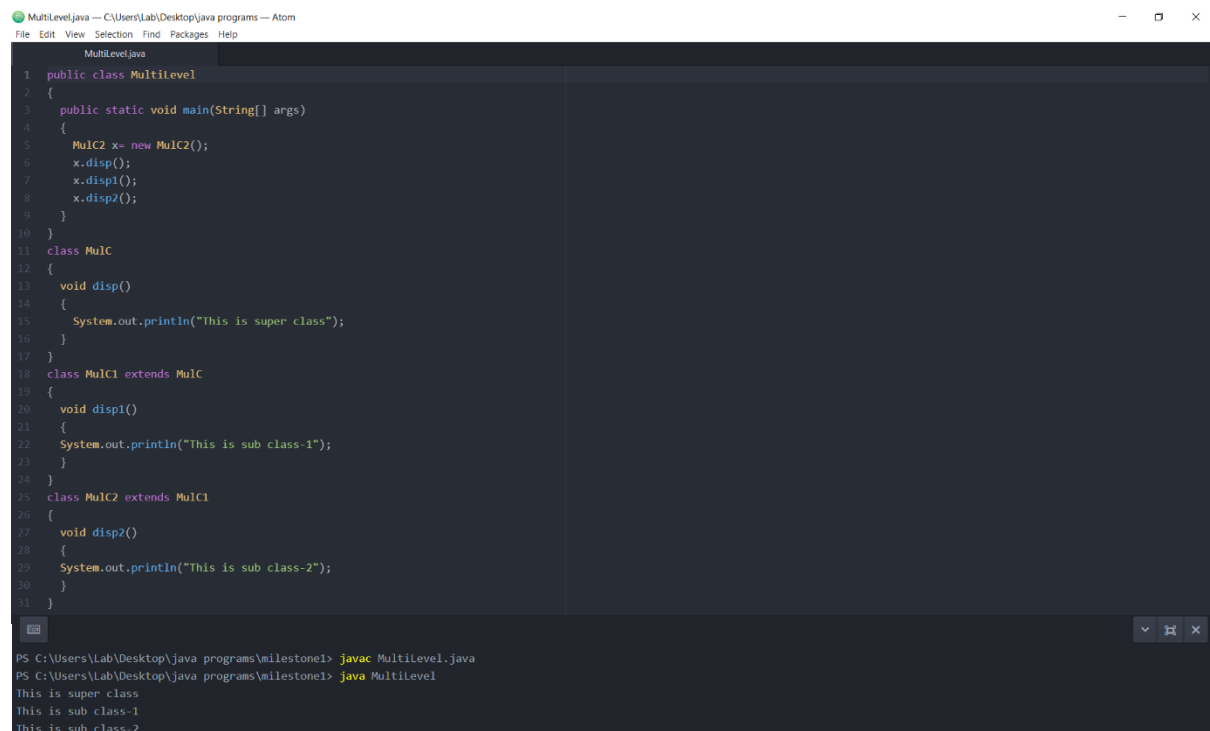
14. Write a java program to implement Hybrid Inheritance.



```
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

```

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     }

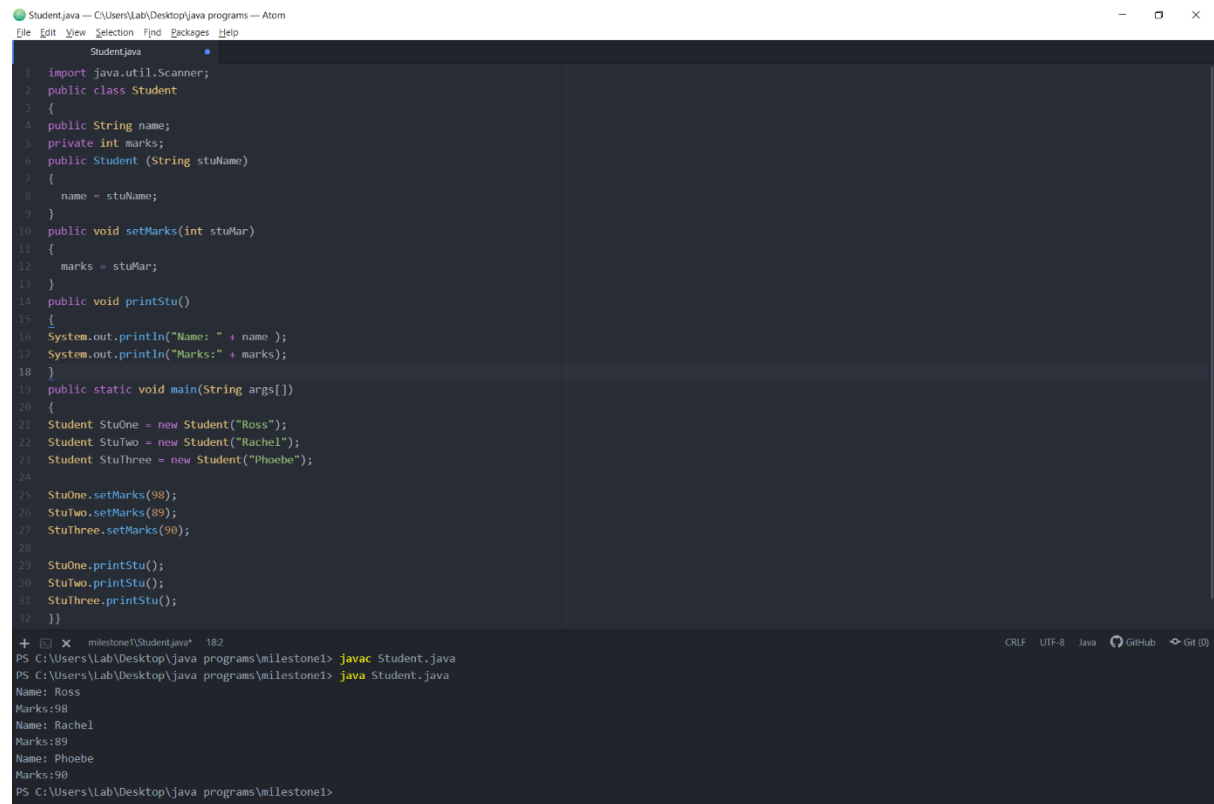
```

```

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.



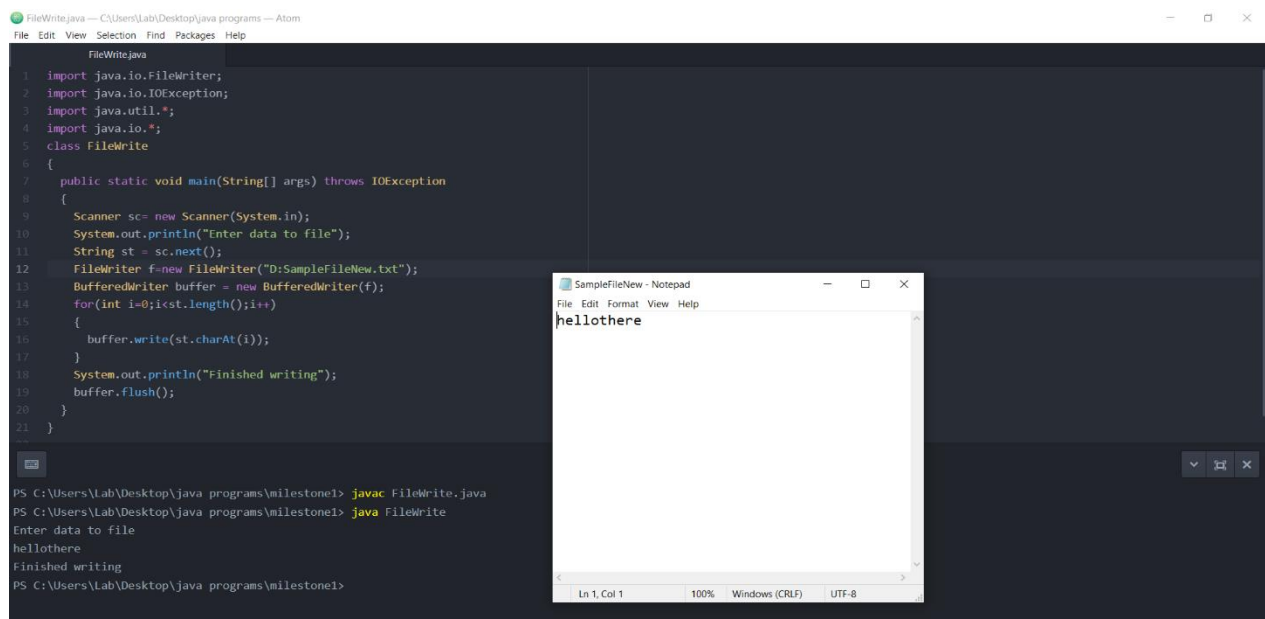
```

Student.java
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.



```

FileWrite.java
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      SampleReader2.java

import java.io.FileNotFoundException;
import java.io.FileReader;
import java.io.IOException;
class SampleReader2
{
    public static void main(String[] args) throws IOException
    {
        char ch;
        FileReader fr=null;
        try
        {
            fr = new FileReader("D:\SampleOutputWriter.txt");
        }
        catch (FileNotFoundException fe)
        {
            System.out.println("File not found");
        }
        int count=0;

        while ((ch=fr.read())!=-1)
        {
            for (int i = 0; i < fr.size(); i++)
            {
                if (ch.charAt(i) == 'a' || ch.charAt(i) == 'e'
                    || ch.charAt(i) == 'i'
                    || ch.charAt(i) == 'o'
                    || ch.charAt(i) == 'u')
                {
                    count++;
                }
            }
            System.out.print(ch);
        }
        fr.close();
    }
}
```

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);
28        }
29    }
30 }
```

```
SwitchOp.java
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
```

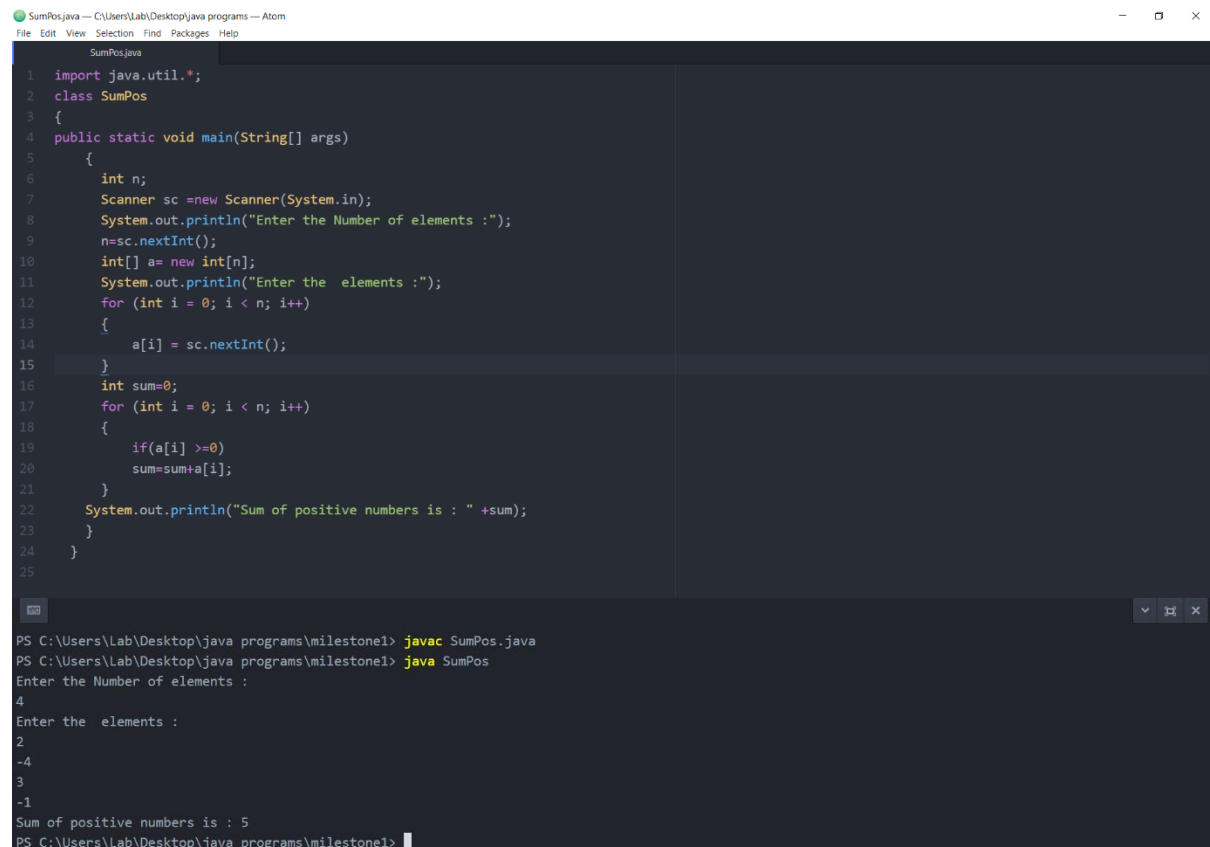
21. Create an array of 10 elements and print them using the for each loop.

```
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).



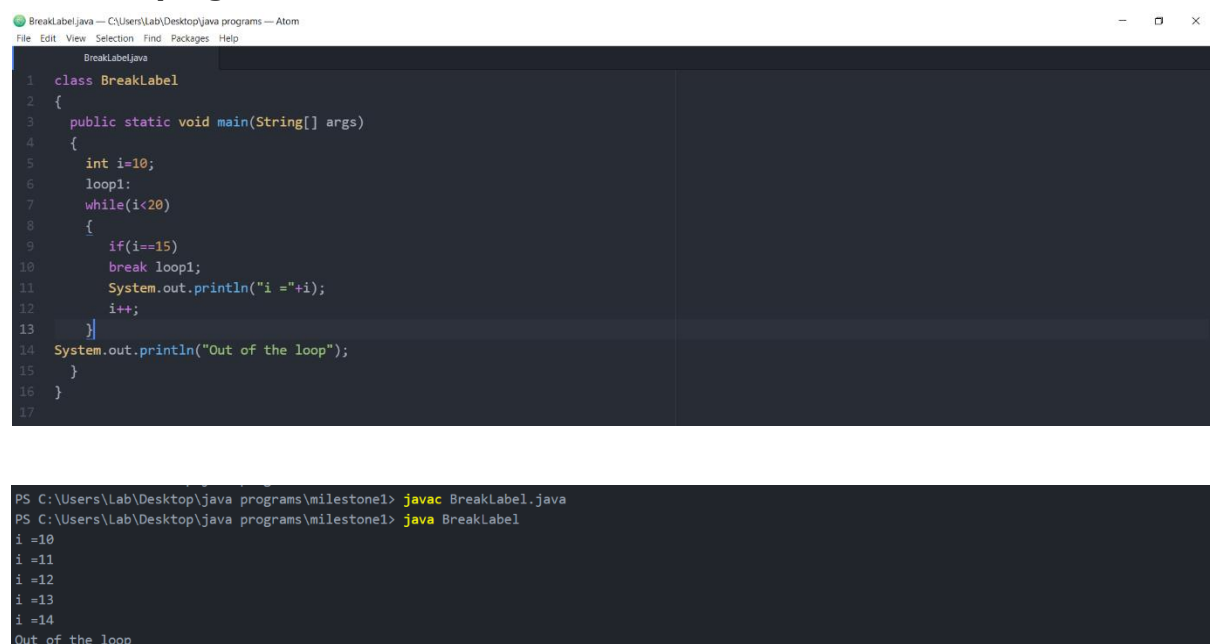
The screenshot shows a Java IDE window titled "SumPos.java" with the following code:

```
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 execution output in the terminal is as follows:

```
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 a Java 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 execution output in the terminal is as follows:

```
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
PS C:\Users\Lab\Desktop\java programs\milestone1>
```

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

```

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 }
    
```

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)

```

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
    
```

```

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 }

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

```
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
File Edit View Selection Find Packages Help

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 }

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
File Edit View Selection Find Packages Help

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

File Edit Format View Help

This is just some sample content

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


```

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 file=new File("D:SampleOutput.txt");
11         int len=(int) file.length();
12         try
13         {
14             FileReader fr=new FileReader(file);
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
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 }
35
PS C:\Users\Lab\Desktop\java programs\milestone1> java CopyFile
File copied successfully!!
PS C:\Users\Lab\Desktop\java programs\milestone1>

```

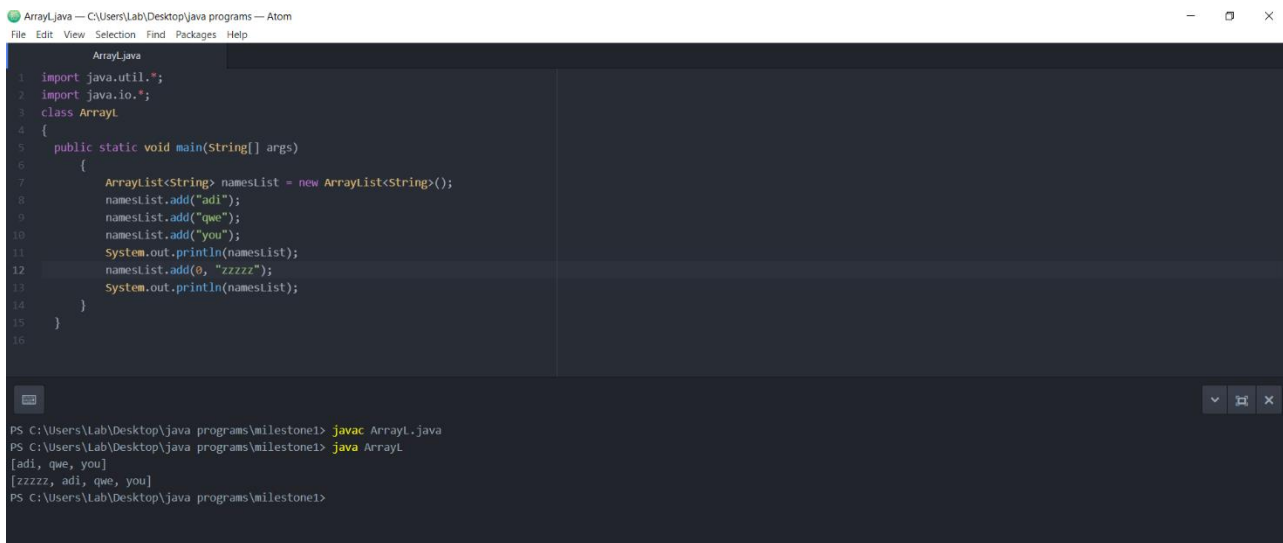
Sample - Notepad

This is just some sample content

Sample - Notepad

This is just some sample content

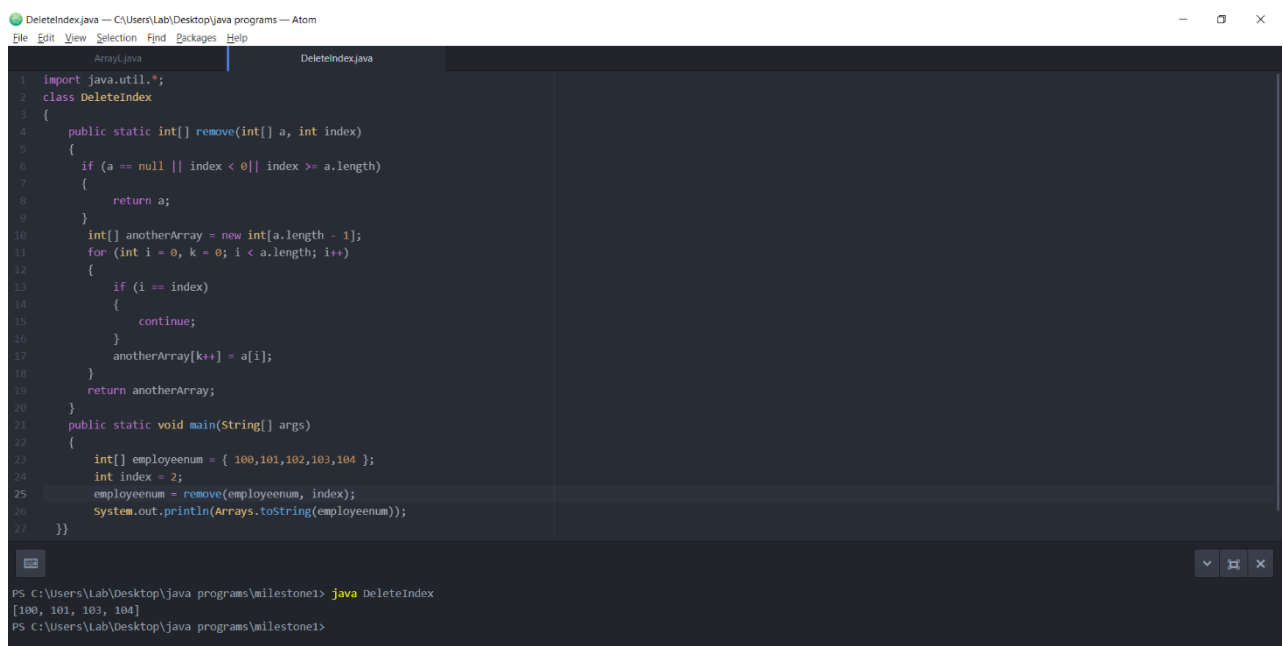
33. How to add an element at a specific position in an ArrayList (create using <>)



```
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>
```

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