

# JAVA ASSIGNMENT 1

Name:- Umme Kulsum

Roll No.:- 25

Div:- A

---

## 1) Assignment on Java Generics:-

### 1.1 Write a java program to demonstrate the Generic Class.

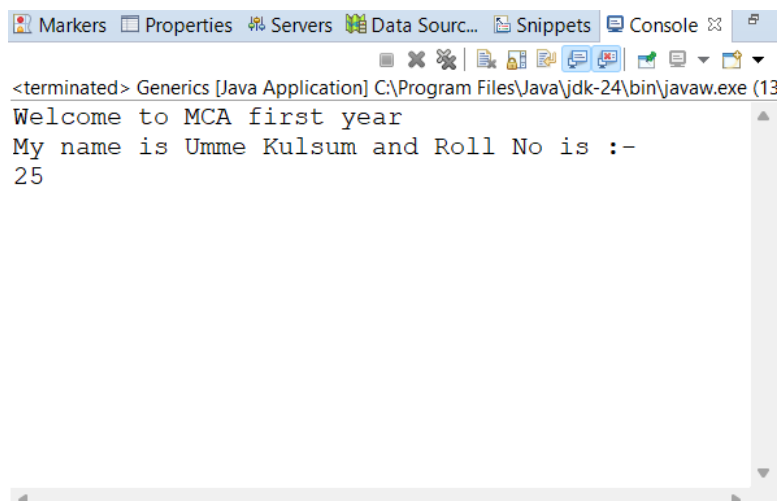
CODE:-

```
package Generics;

class Geg<T>{
    T obj;
    Geg(T obj) { this.obj = obj; }
    public T get() { return this.obj; }
}

public class Generics {
    public static void main(String[] args) {
        Geg <String> s = new Geg<String>("Welcome to MCA
first year");
        System.out.println(s.get());
        Geg <String> S =new Geg<String>("My name is Umme
Kulsum and Roll No is :-");
        System.out.println(S.get());
        Geg <Integer> i = new Geg<Integer>(25);
        System.out.println(i.get());
    }
}
```

### OUTPUT

A screenshot of a Java IDE's console window. The window title is "<terminated> Generics [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (13...". The console output shows the results of the program execution: "Welcome to MCA first year", "My name is Umme Kulsum and Roll No is :-", and "25". The IDE interface includes tabs for Markers, Properties, Servers, Data Sourc..., Snippets, and Console. The console window has a scroll bar on the right side.

```
<terminated> Generics [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (13...
Welcome to MCA first year
My name is Umme Kulsum and Roll No is :-
25
```

## 1.2 Write a java program to demonstrate Generic Methods.

### CODE:

```
package GenericAssignment;

public class GenericAssignment {
    // Generic method definition
    public static <T> void printArray(T[] array) {
        System.out.print("Array elements: ");
        for (T element : array) {
            System.out.print(element + " ");
        }
        System.out.println();
    }

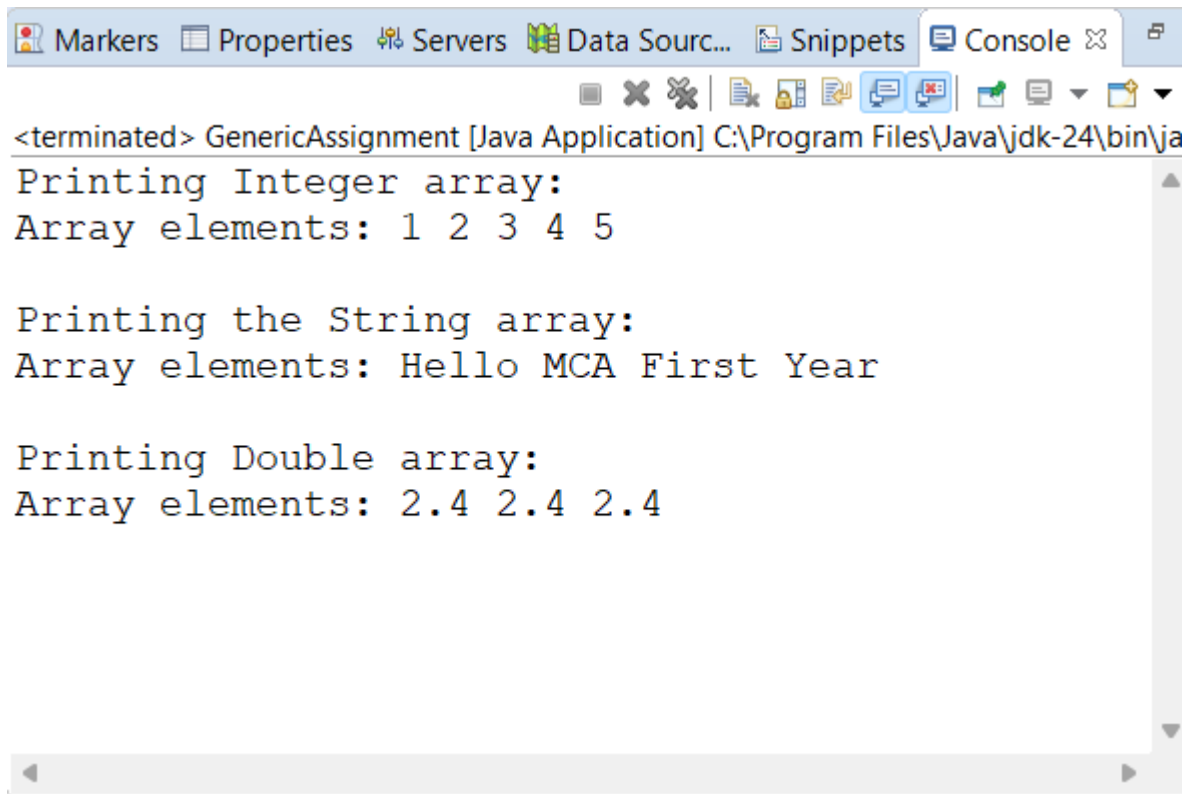
    public static void main(String[] args) {

        Integer[] intArray = {1, 2, 3, 4, 5};
        System.out.println("Printing Integer array:");
        printArray(intArray);

        String[] stringArray = {"Hello", "MCA", "First",
"Year"};
        System.out.println("\nPrinting the String array:");
        printArray(stringArray);

        Double[] doubleArray = {2.4, 2.4, 2.4};
        System.out.println("\nPrinting Double array:");
        printArray(doubleArray);
    }
}
```

### OUTPUT:



The screenshot shows an IDE console window with the following tabs: Markers, Properties, Servers, Data Sourc..., Snippets, and Console. The console output is as follows:

```
<terminated> GenericAssignment [Java Application] C:\Program Files\Java\jdk-24\bin\ja
Printing Integer array:
Array elements: 1 2 3 4 5

Printing the String array:
Array elements: Hello MCA First Year

Printing Double array:
Array elements: 2.4 2.4 2.4
```

### 1.3 Write a java program to demonstrate Wildcards in Java Generics.

#### (a) Upper bounded wildcards:-

```
package WildcardsUpper;
import java.util.*;

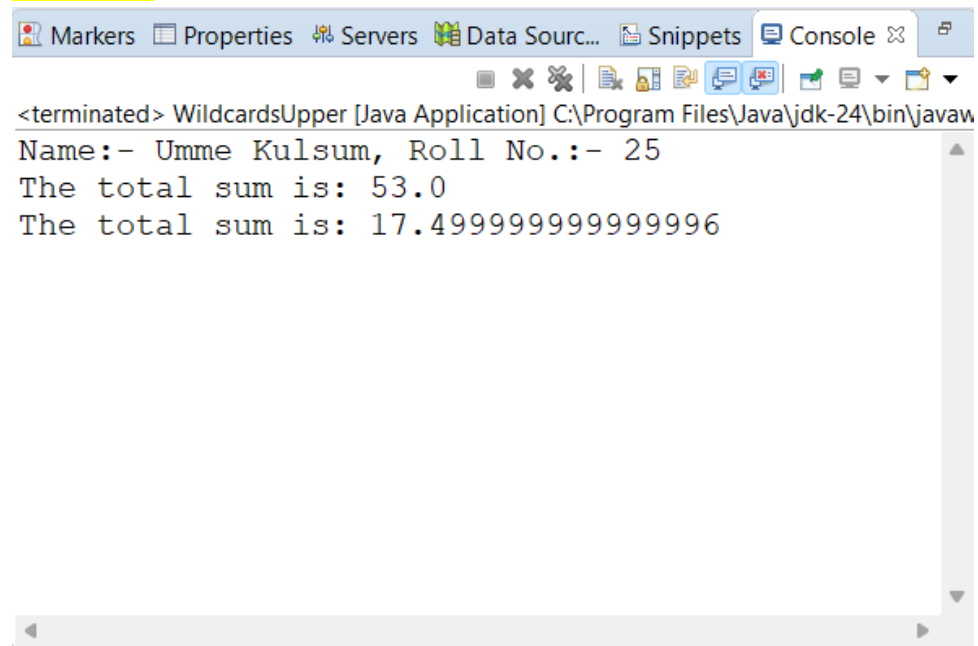
public class WildcardsUpper {
    public static void main(String[] args) {
        System.out.println("Name:- Umme Kulsum, Roll No.:-
25");

        List<Integer> l1 = Arrays.asList(2, 8, 9, 6, 7, 8, 9,
4);
        System.out.println("The total sum is: " + sum(l1));

        List<Double> l2 = Arrays.asList(4.1, 4.3, 6.7, 2.4);
        System.out.println("The total sum is: " + sum(l2));
    }

    private static double sum(List<? extends Number> list) {
        double sum = 0.0;
        for (Number num : list) {
            sum += num.doubleValue();
        }
        return sum;
    }
}
```

## OUTPUT:



```
<terminated> WildcardsUpper [Java Application] C:\Program Files\Java\jdk-24\bin\javaw
Name:- Umme Kulsum, Roll No.:- 25
The total sum is: 53.0
The total sum is: 17.499999999999996
```

## (b) Lower bounded wildcards:-

```
package WildcardsLower;
import java.util.*;

public class WildcardsLower {
    public static void main(String[] args) {
        System.out.println("Name:- Umme Kulsum, Roll No.:-
25");
        List<Integer> list1 = Arrays.asList(7, 8, 9, 3, 4, 5);
        print1(list1);
        List<Number> list2 = Arrays.asList(3, 45, 56, 7, 4);
        print1(list2);
    }

    public static void print1(List<? super Integer> list) {
        System.out.println(list);
    }
}
```

## OUTPUT:

```
<terminated> WildcardsLower [Java Application] C:\Program Files\Java\jdk-24\bin\jav
Name:- Umme Kulsum, Roll No.:- 25
[7, 8, 9, 3, 4, 5]
[3, 45, 56, 7, 4]
```

## (c) Unbounded wildcards:-

```
package WildcardsUnbound;
import java.util.*;

public class WildcardsUnbound {
    public static void main(String[] args) {
        System.out.println("Name:- Umme Kulsum, Roll No.:-
25");
        List<Integer> list1 = Arrays.asList(3, 2, 5, 6);
        List<Double> list2 = Arrays.asList(2.2, 6.7, 6.6,
8.8);
        printlist(list1);
        printlist(list2);
    }
    private static void printlist(List<?> list) {
        System.out.println(list);
    }
}
```

## OUTPUT:

```
<terminated> WildcardsUnbound [Java Application] C:\Program Files\Java\jdk-24\bin\jav
Name:- Umme Kulsum, Roll No.:- 25
[3, 2, 5, 6]
[2.2, 6.7, 6.6, 8.8]
```

## 2) Assignment on List Interface:-

(2.1) Write a Java program to create List containing list of items of type String and use for-each loop to print the items of the list.

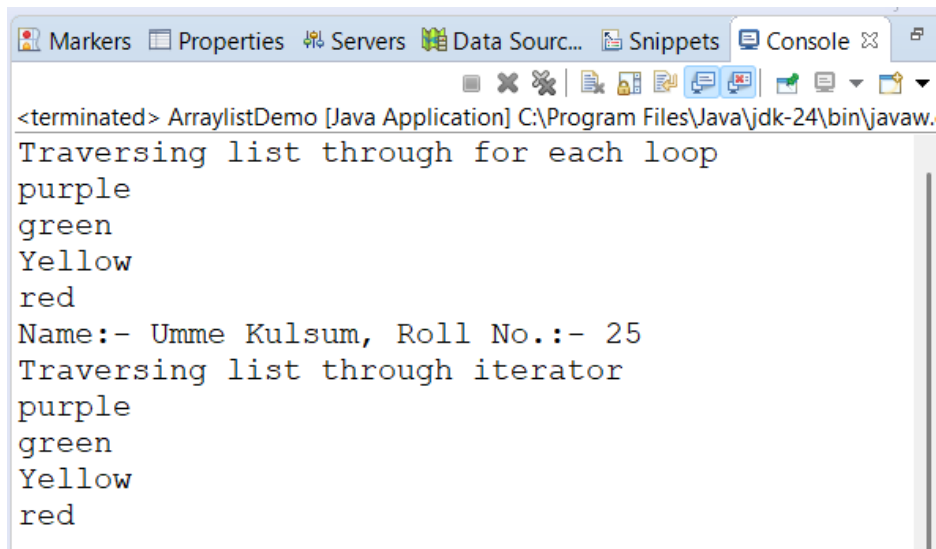
**CODE:**

```
package ArrayListDemo;
import java.util.*;

import java.util.ArrayList;
import java.util.Iterator;

public class ArrayListDemo {
    public static void main(String args[]) {
        int a;
        ArrayList<String> list = new ArrayList<String>();
        list.add("purple");
        list.add("green");
        list.add("Yellow");
        list.add("red");
        System.out.println(list);
        System.out.println("Traversing list through for each
loop");
        for (String color : list)
            System.out.println(color);
        System.out.println("Name:- Umme Kulsum, Roll No.:-
25");
        System.out.println("Traversing list through
iterator");
        Iterator itr = list.iterator();
        while (itr.hasNext()) {
            System.out.println(itr.next());
        }
    }
}
```

**OUTPUT:**



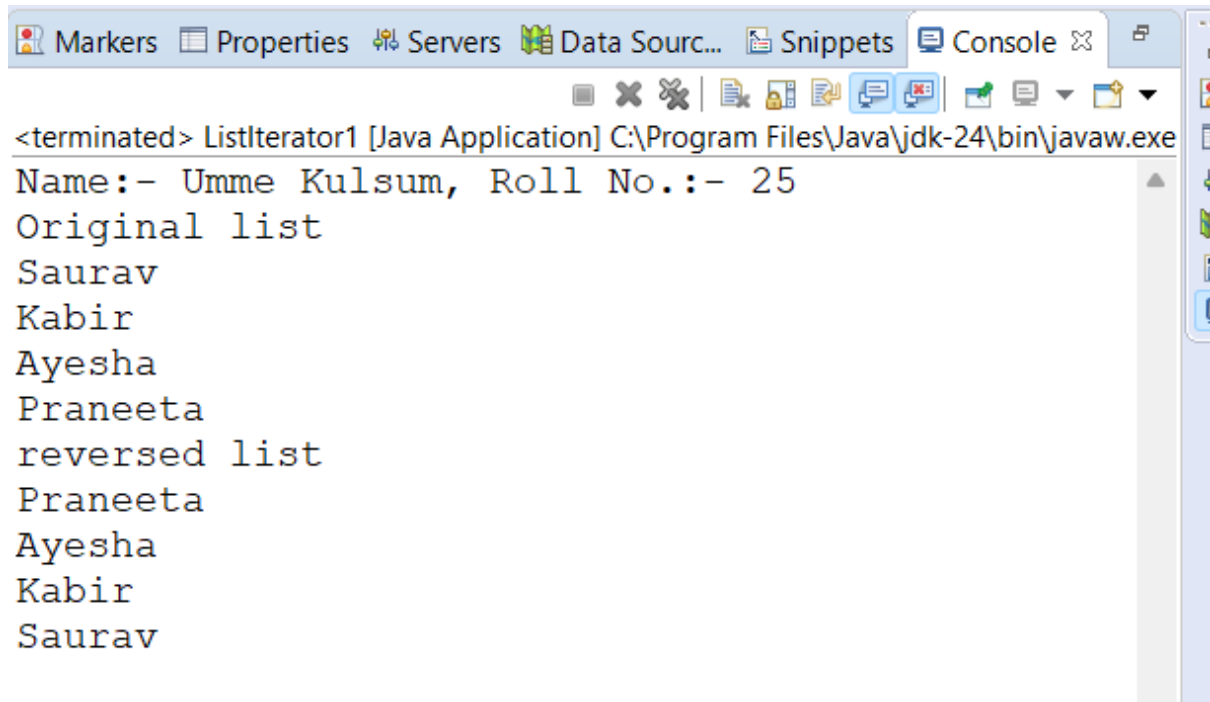
```
<terminated> ArrayListDemo [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.  
Traversing list through for each loop  
purple  
green  
Yellow  
red  
Name:- Umme Kulsum, Roll No.:- 25  
Traversing list through iterator  
purple  
green  
Yellow  
red
```

**2.2 Write a Java program to create List containing list of items and use ListIterator interface to print items present in the list. Also print the list in reverse/backward direction**

**Code:**

```
package ListIterator1;  
import java.util.*;  
  
public class ListIterator1 {  
    public static void main(String args[]) {  
        List<String> mylist = new ArrayList<String>();  
        mylist.add("Saurav");  
        mylist.add("Kabir");  
        mylist.add("Ayesha");  
        mylist.add("Praneeta");  
        System.out.println("Name:- Umme Kulsum, Roll No.:-  
25");  
        System.out.println("Original list");  
        Iterator<String> itr = mylist.iterator();  
        while (itr.hasNext()) {  
            System.out.println(itr.next());  
        }  
        Collections.reverse(mylist);  
        System.out.println("reversed list");  
        Iterator<String> itr1 = mylist.iterator();  
        while (itr1.hasNext()) {  
            System.out.println(itr1.next());  
        }  
    }  
}
```

## OUTPUT:



```
<terminated> ListIterator1 [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe
Name:- Umme Kulsum, Roll No.:- 25
Original list
Saurav
Kabir
Ayesha
Praneeta
reversed list
Praneeta
Ayesha
Kabir
Saurav
```

### 3) Assignment on SET Interface:-

(3.1) Write a Java program to create a Set containing list of items of type String and print the items in the list using Iterator interface. Also print the list in reverse/backward direction.

#### CODE:-

```
package SetIterator1;
import java.util.*;

public class SetIterator1 {
    public static void main(String[] args) {
        System.out.println("Name: Umme Kulsum, Div: A, Roll
No: 25\n");
        Scanner sc = new Scanner(System.in);
        Set<String> itemSet = new LinkedHashSet<>();
        System.out.print("Enter the number of items: ");
        int n = sc.nextInt();
        sc.nextLine();
        System.out.println("Enter the items:");
        for (int i = 0; i < n; i++) {
            System.out.print("Item " + (i + 1) + ": ");
            String item = sc.nextLine();
            itemSet.add(item);
        }
    }
}
```

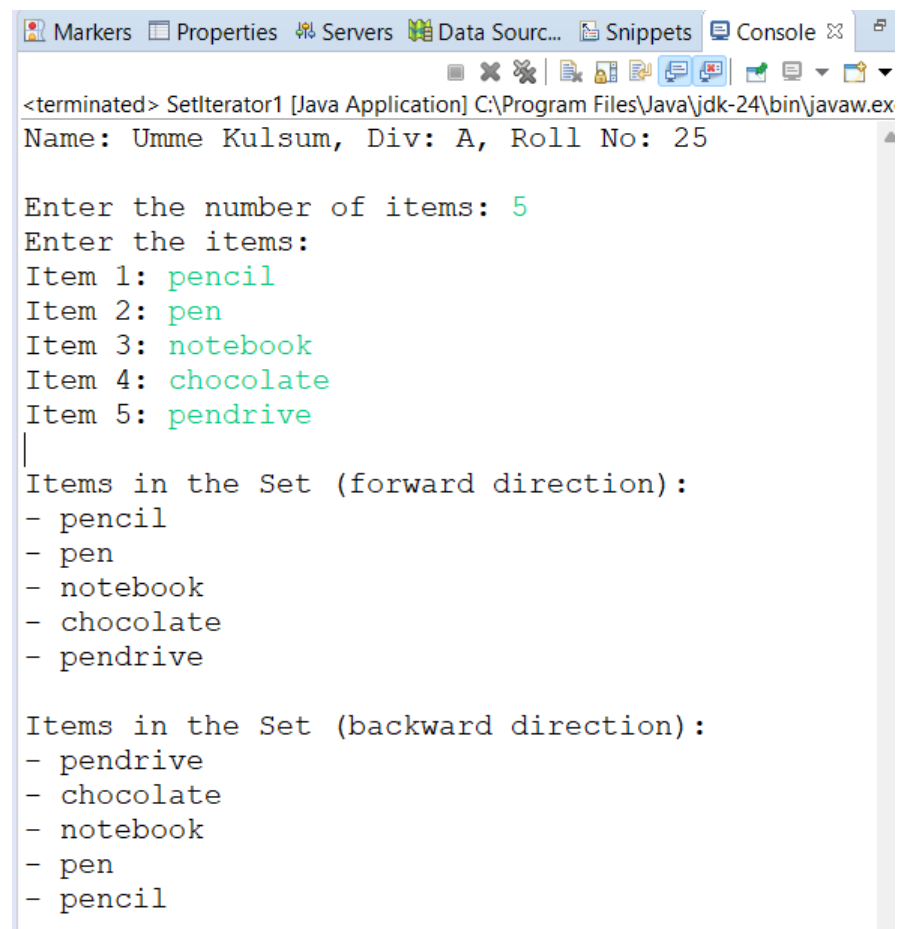


```

        LinkedList<String> itemList = new
LinkedList<>(itemSet);
        ListIterator<String> iterator =
itemList.listIterator();
        System.out.println("\nItems in the Set (forward
direction):");
        while (iterator.hasNext()) {
            System.out.println("- " + iterator.next());
        }
        System.out.println("\nItems in the Set (backward
direction):");
        while (iterator.hasPrevious()) {
            System.out.println("- " + iterator.previous());
        }
        sc.close();
    }
}

```

## OUTPUT:



```

<terminated> SetIterator1 [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe
Name: Umme Kulsum, Div: A, Roll No: 25

Enter the number of items: 5
Enter the items:
Item 1: pencil
Item 2: pen
Item 3: notebook
Item 4: chocolate
Item 5: pendrive
|
Items in the Set (forward direction):
- pencil
- pen
- notebook
- chocolate
- pendrive

Items in the Set (backward direction):
- pendrive
- chocolate
- notebook
- pen
- pencil

```

**(3.2) Write a Java program using Set interface containing list of items and Perform the following operations:**

- a. Add items in the set.**
- b. Insert items of one set in to other set.**
- c. Remove items from the set**
- d. Search the specified item in the set**

**CODE:**

```
package SetLterator2;
import java.util.*;

public class SetLterator2 {
    public static void main(String[] args) {
        System.out.println("Name: Umme Kulsum, Div: A, Roll
No: 25\n");

        Set<String> set1 = new LinkedHashSet<>();
        System.out.print("Enter number of items to add in
first set: ");
        Scanner sc = new Scanner(System.in);
        int n1 = sc.nextInt();
        sc.nextLine();
        System.out.println("Enter items for first set:");
        for (int i = 0; i < n1; i++) {
            System.out.print("Item " + (i + 1) + ": ");
            set1.add(sc.nextLine());
        }
        System.out.println("First Set: " + set1);

        Set<String> set2 = new TreeSet<>();
        System.out.print("\nEnter number of items to add in
second set: ");
        int n2 = sc.nextInt();
        sc.nextLine();
        System.out.println("Enter items for second set:");
        for (int i = 0; i < n2; i++) {
            System.out.print("Item " + (i + 1) + ": ");
            set2.add(sc.nextLine());
        }
        System.out.println("Second Set: " + set2);

        set1.addAll(set2);
        System.out.println("\nAfter inserting items of second
set into first set:");
        System.out.println("First Set (after merge): " +
set1);
    }
}
```

```

        System.out.print("\nEnter item to remove from first
set: ");
        String removeItem = sc.nextLine();
        if (set1.remove(removeItem)) {
            System.out.println(removeItem + " removed
successfully.");
        } else {
            System.out.println(removeItem + " not found in the
set.");
        }
        System.out.println("First Set after removal: " +
set1);

        System.out.print("\nEnter item to search in first set:
");
        String searchItem = sc.nextLine();
        if (set1.contains(searchItem)) {
            System.out.println(searchItem + " is present in
the set.");
        } else {
            System.out.println(searchItem + " is not found in
the set.");
        }

        sc.close();
    }
}

```

**OUTPUT:**

```
Markers Properties Servers Data Source Explorer Snippets Console
<terminated> SetIterator2 [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (13-Dec-2025, 9:51:37 PM)
Name: Umme Kulsum, Div: A, Roll No: 25

Enter number of items to add in first set: 2
Enter items for first set:
Item 1: pen
Item 2: pencil
First Set: [pen, pencil]

Enter number of items to add in second set: 3
Enter items for second set:
Item 1: chocolate
Item 2: candy
Item 3: pendrive
Second Set: [candy, chocolate, pendrive]

After inserting items of second set into first set:
First Set (after merge): [pen, pencil, candy, chocolate, pendrive]

Enter item to remove from first set: pen
pen removed successfully.
First Set after removal: [pencil, candy, chocolate, pendrive]

Enter item to search in first set: pen
pen is not found in the set.
```

## 4) Assignment on MAP Interface:

(4.1) Write a Java program using Map interface containing list of items having keys and associated values and perform the following operations:

- Add items in the map.
- Remove items from the map
- Search specific key from the map
- Get value of the specified key
- Insert map elements of one map in to other map.
- Print all keys and values of the map.

### CODE:

```
package MapIterator1;
import java.util.*;

public class MapIterator1 {
    public static void main(String args[]) {
        System.out.println("Name: Umme Kulsum, Div: A, Roll
No: 25\n");
```

```

Map<String,String> hmap = new HashMap<>();
hmap.put("Delhi", "New Delhi");
hmap.put("South korea", "Seoul");
hmap.put("Japan", "Tokyo");
hmap.put("Russia", "Moscow");
hmap.put("United Kingdom", "London");

for (Map.Entry<String, String> m : hmap.entrySet()) {
    System.out.println("Capital of " + m.getKey() + "
is " + m.getValue());
}

System.out.println("-----");
hmap.remove("United Kingdom");

for (Map.Entry<String, String> m : hmap.entrySet()) {
    System.out.println("Capital of " + m.getKey() + "
is " + m.getValue());
}

System.out.println("_____");
System.out.println("Capital of India is " +
hmap.get("Delhi"));
System.out.println("_____");

Map<String, String> hmap2 = new HashMap<>();
hmap2.put("Germany", "Berlin");
hmap2.put("Georgia", "Tbilisi");

hmap.putAll(hmap2);

for (Map.Entry<String, String> m : hmap.entrySet()) {
    System.out.println("Capital of " + m.getKey() + "
is " + m.getValue());
}
}

```

**OUTPUT:**

```
Markers Properties Servers Data Source Explorer Snippets Console
<terminated> Maplterator1 [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (13-D
Name: Umme Kulsum, Div: A, Roll No: 25

Capital of Delhi is New Delhi
Capital of Japan is Tokyo
Capital of United Kingdom is London
Capital of South korea is Seoul
Capital of Russia is Moscow
-----
Capital of Delhi is New Delhi
Capital of Japan is Tokyo
Capital of South korea is Seoul
Capital of Russia is Moscow
_____
Capital of India is New Delhi
_____
Capital of Delhi is New Delhi
Capital of Japan is Tokyo
Capital of Georgia is Tbilisi
Capital of Germany is Berlin
Capital of South korea is Seoul
Capital of Russia is Moscow
```

## (5) LAMBDA EXPRESSIONS

(5.1) Write a Java program using Lambda Expression to print "Hello World".

**CODE :-**

```
package LamdaHelloWorld;

interface hello1 {
    void hi();
}

public class LamdaHelloWorld {
    public static void main(String[] args) {
        System.out.println("Name:- Umme Kulsum, Roll No.:-
25");
        hello1 h1 = () -> {
            System.out.print("hello world lambda");
        };
        h1.hi();
    }
}
```

**OUTPUT:**

```
<terminated> LamdaHelloWorld [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (1\nName:- Umme Kulsum, Roll No.:- 25\nhello world lambda
```

**(5.2) Write a Java program using Lambda Expression with single parameters.**

**CODE:-**

```
package LambdaSinglePara;

interface cube {
    double cubevolume(double L);
}

public class LambdaSinglePara {
    public static void main(String[] args) {
        System.out.println("Name: Umme Kulsum, Div: A, Roll\nNo: 25\n");
        cube c2 = (L) -> {
            return L * L * L;
        };
        System.out.print(c2.cubevolume(2));
    }
}
```

**OUTPUT:**

```
<terminated> LambdaSinglePara [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe\nName: Umme Kulsum, Div: A, Roll No: 25\n\n8.0
```

**(5.3) Write a Java program using Lambda Expression with multiple parameters to add two numbers.**

**CODE:**

```
package LambdaTwoPara;
import java.util.*;

interface Lambda {
    double addNum(double a, double b);
}

public class LambdaTwoPara {
    public static void main(String[] args) {
```

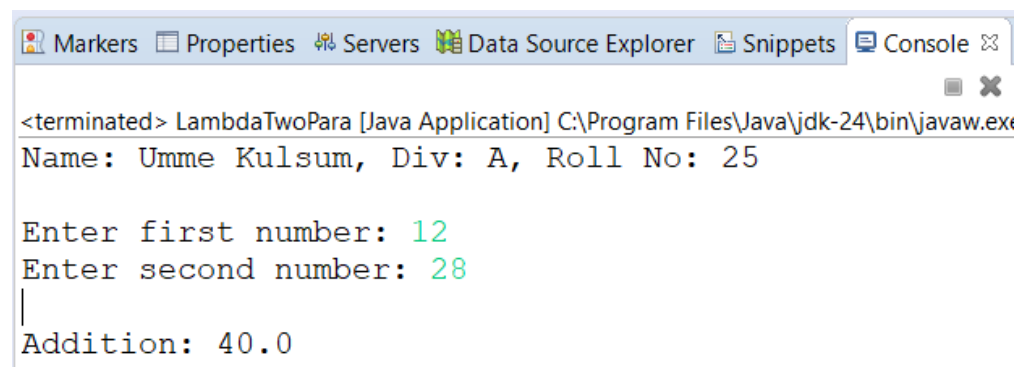
```

        System.out.println("Name: Umme Kulsum, Div: A, Roll
No: 25\n");
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter first number: ");
        double num1 = sc.nextDouble();
        System.out.print("Enter second number: ");
        double num2 = sc.nextDouble();

        Lambda m = (a, b) -> a + b;
        System.out.println("\nAddition: " + m.addNum(num1,
num2));
        sc.close();
    }
}

```

### OUTPUT:



```

<terminated> LambdaTwoPara [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe
Name: Umme Kulsum, Div: A, Roll No: 25

Enter first number: 12
Enter second number: 28
|
Addition: 40.0

```

## 5.4 Write a Java program using Lambda Expression to calculate the following:

**a. Convert Fahrenheit to Celcius**

**b. Convert Kilometers to Miles.**

### CODE:-

```

package ASSIGNMENT;
import java.util.Scanner;
interface TemperatureConverter {
    double convert(double celsius);
}
interface DistanceConverter {
    double convert(double kilometers);
}
public class Temp {
    public static void main(String[] args) {
        System.out.println("Name: Ritesh Shinde, Div: B, Roll No: 54\n");
        Scanner sc = new Scanner(System.in);

        TemperatureConverter tempConverter = (celsius) -> (celsius * 1.8) + 32;
    }
}

```



```

DistanceConverter distanceConverter = (kilometers) -> kilometers * 0.623;

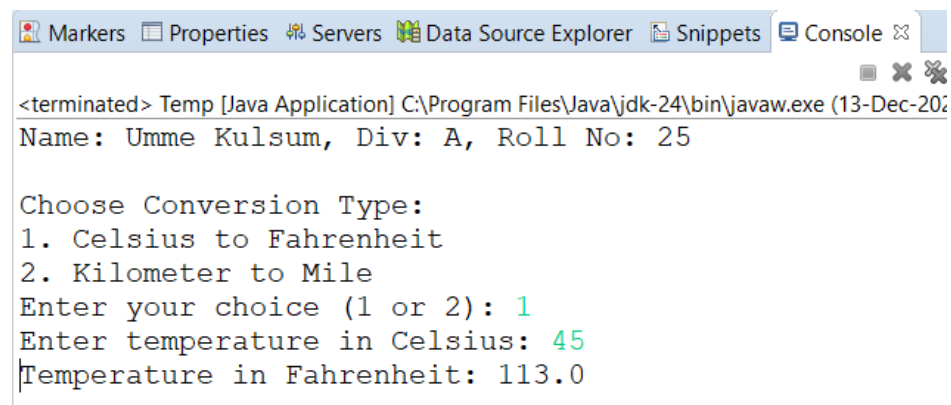
System.out.println("Choose Conversion Type:");
System.out.println("1. Celsius to Fahrenheit");
System.out.println("2. Kilometer to Mile");
System.out.print("Enter your choice (1 or 2): ");

int choice = sc.nextInt();

if (choice == 1) {
    System.out.print("Enter temperature in Celsius: ");
    double celsius = sc.nextDouble();
    System.out.println("Temperature in Fahrenheit: " + tempConverter.convert(celsius));
} else if (choice == 2) {
    System.out.print("Enter distance in Kilometers: ");
    double kilometers = sc.nextDouble();
    System.out.println("Distance in Miles: " + distanceConverter.convert(kilometers));
} else {
    System.out.println("Invalid choice! Please select 1 or 2.");
}
sc.close();
}
}

```

## OUTPUT:

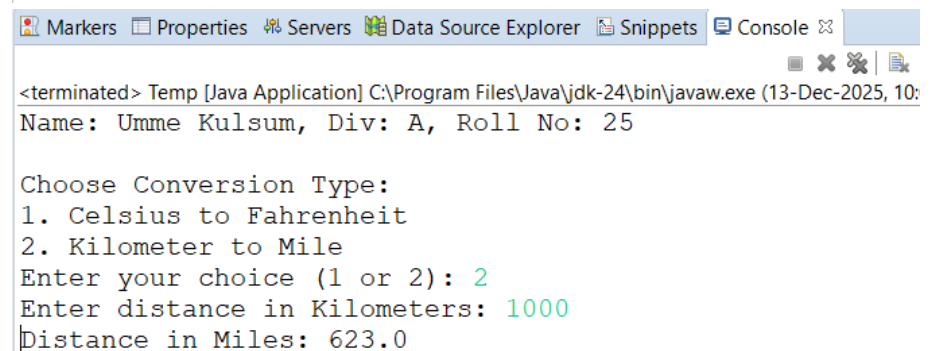


```

<terminated> Temp [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (13-Dec-20:
Name: Umme Kulsum, Div: A, Roll No: 25

Choose Conversion Type:
1. Celsius to Fahrenheit
2. Kilometer to Mile
Enter your choice (1 or 2): 1
Enter temperature in Celsius: 45
Temperature in Fahrenheit: 113.0

```



```

<terminated> Temp [Java Application] C:\Program Files\Java\jdk-24\bin\javaw.exe (13-Dec-2025, 10:
Name: Umme Kulsum, Div: A, Roll No: 25

Choose Conversion Type:
1. Celsius to Fahrenheit
2. Kilometer to Mile
Enter your choice (1 or 2): 2
Enter distance in Kilometers: 1000
Distance in Miles: 623.0

```

**(5.5) Write a Java program using Lambda Expression with or without return keyword.**

**CODE :-**

```
package return1;

import java.util.Scanner;

interface GreetingMessage {
    String showMessage(String name);
}

interface MorningGreeting {
    void greet();
}

public class return1 {
    public static void main(String[] args) {
        System.out.println("Name: Umme Kulsum ,Roll No: 25\n");
        Scanner sc = new Scanner(System.in);

        GreetingMessage personalizedGreeting = (name) -> {
            return "Hello Dear, " + name + ", GOOD EVENING!";
        };

        MorningGreeting morningGreeting = () -> {
            System.out.println("Please take your Coffee!");
        };

        System.out.print("Enter your name: ");
        String userName = sc.nextLine();
        System.out.println(personalizedGreeting.showMessage(userName));
        morningGreeting.greet();

        sc.close();
    }
}
```

**OUTPUT:**

## 5.6 Write a Java program using Lambda Expression to concatenate two strings.

**CODE :-**

```
package strConcat;

import java.util.*;

interface ConcatStr {
    public String concat(String s1, String s2);
}

public class StrConcat {
    public static void main(String[] args) {
        System.out.println("Name: Umme Kulsum, Div: A, Roll
No: 25\n");
        ConcatStr cs = (String s1, String s2) -> s1 + s2;
        System.out.println("Concatenating \"hello,\" and \"
World\" = \" + cs.concat(" Hello,", "World"));
    }
}
```

**OUTPUT:**