Ex. 2 **UNITS CONVERTERS**

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AIM:

To develop a Java application that converts different units and currencies.

ALGORITHM:

1. Create different classes for each converter and define the members of the classes and the methods used.
2. Create a main class which creates objects in order to access the members of the other classes.
3. Receive the inputs from the user during the runtime.
4. Compute the conversion based on the unit or currency.
5. Display the converted value.

PROGRAM:

```
// Class for Currency Converter
package Java.Lab2;

public class currencyConverter {
    // Constant Factors
    private static final double dollarToINRFactor = 83.72;
    private static final double INRToDollarFactor = 0.012;
    private static final double euroToINRFactor = 90.96;
    private static final double INRToEuroFactor = 0.011;
    private static final double yenToINRFactor = 0.55;
    private static final double INRToYenFactor = 1.83;
    // Methods defined in the Class
    public double dollarToINR(double dollar)
    {
        double INR = dollar * dollarToINRFactor;
        return INR;
    }
    public double INRToDollar(double INR)
    {
        double dollar = INR * INRToDollarFactor;
        return dollar;
    }
    public double euroToINR(double euro)
    {
```

```
        double INR = euro * euroToINRFactor;
        return INR;
    }
    public double INRtoEuro(double INR)
    {
        double euro = INR * INRToEuroFactor;
        return euro;
    }
    public double yenToINR(double yen)
    {
        double INR = yen * yenToINRFactor;
        return INR;
    }
    public double INRToYen(double INR)
    {
        double yen = INR * INRToYenFactor;
        return yen;
    }
}

// Class for Distance Converter
package Java.Lab2;

public class distanceConverter {
    // Constant Factors
```

```
    private static final double milesToKilometerFactor = 1.609;
    private static final double kilometerToMilesFactor = 0.621;
    // Methods defined in the Class
    public double milesToKilometer(double miles)
    {
        double km = miles * milesToKilometerFactor;
        return km;
    }
    public double kilometerToMiles(double km)
    {
        double miles = km * kilometerToMilesFactor;
        return miles;
    }
}

// Class for Time Converter
package Java.Lab2;

public class timeConverter {
    // Constant Factors
    private static final double hoursToMinutesFactor = 60;
    private static final double minutesToHourFactor = 0.0167;
    private static final double minutesToSecondsFactor = 60;
    private static final double secondsToMinutesFactor = 0.0167;
    private static final double hoursToSecondsFactor = 3600;
```

```
private static final double secondsToHoursFactor = 0.000278;
// Methods defined in the Class
public double hoursToMinutes(double hours)
{
   return hours * hoursToMinutesFactor;
}
public double minutesToHours(double minutes)
{
   return minutes * minutesToHourFactor;
}
public double minutesToSeconds(double minutes)
{
   return minutes * minutesToSecondsFactor;
}
public double secondsToMinutes(double seconds)
{
   return seconds * secondsToMinutesFactor;
}
public double hoursToSeconds(double hours)
{
   return hours * hoursToSecondsFactor;
}
public double secondsToHours(double seconds)
{
   return seconds * secondsToHoursFactor;
```

```
    }
}

// Main Class
package Java.Lab2;
// Importing the other classes
import Java.Lab2.distanceConverter;
import Java.Lab2.currencyConverter;
import Java.Lab2.timeConverter;
import java.util.Scanner;
public class lab2 {
    public static void main(String[] args) {
        int choice;
        int subChoice;
        double value;
        boolean loopController = true;
        Scanner input = new Scanner(System.in);
        // Menu Driven Program
        while(loopController)
        {
            System.out.println("Hello!");
            System.out.println("Enter the Serial Number for the Converter Required :");
            System.out.println("1. Distance Converter.");
            System.out.println("2. Currency Converter.");
```

```
            System.out.println("3. Time Converter.");
            System.out.println("4. Exit.");
            choice = input.nextInt();
            switch (choice) {
               case 1:
                  distanceConverter objDistance = new
distanceConverter();
                  System.out.println("Enter the Serial Number for the Type
of Conversion : ");
                  System.out.println("1. Miles to Kilometers.");
                  System.out.println("2. Kilometers to Miles.");
                  subChoice = input.nextInt();
                  switch (subChoice) {
                     case 1:
                        System.out.println("Enter the number of Miles : ");
                        value = input.nextDouble();
                        System.out.println("Kilometers =
"+objDistance.milesToKilometer(value));
                        break;
                     case 2:
                        System.out.println("Enter the number of Kilometers
: ");
                        value = input.nextDouble();
                        System.out.println("Miles =
"+objDistance.kilometerToMiles(value));
                        break;
```

```
                default:
                    System.out.println("Invalid Input.");
                    break;
                }
                break;

            case 2:
                currencyConverter objCurrency = new
currencyConverter();
                System.out.println("Enter the Serial Number for the Type
of Conversion : ");
                System.out.println("1. INR to Dollars.");
                System.out.println("2. Dollars to INR.");
                System.out.println("3. INR to Euro.");
                System.out.println("4. Euro to INR.");
                System.out.println("5. INR to Yen.");
                System.out.println("6. Yen to INR.");
                subChoice = input.nextInt();
                switch (subChoice) {
                case 1:
                    System.out.println("Enter the number of INR : ");
                    value = input.nextDouble();
                    System.out.println("Dollars =
"+objCurrency.INRToDollar(value));
                    break;
                case 2:
```

```
                    System.out.println("Enter the number of Dollars : ");
                    value = input.nextDouble();
                    System.out.println("INR =
"+objCurrency.dollarToINR(value));
                    break;
                case 3:
                    System.out.println("Enter the number of INR : ");
                    value = input.nextDouble();
                    System.out.println("Euro =
"+objCurrency.INRtoEuro(value));
                    break;
                case 4:
                    System.out.println("Enter the number of Euro : ");
                    value = input.nextDouble();
                    System.out.println("INR =
"+objCurrency.euroToINR(value));
                    break;
                case 5:
                    System.out.println("Enter the number of INR : ");
                    value = input.nextDouble();
                    System.out.println("Yen =
"+objCurrency.INRToYen(value));
                    break;
                case 6:
                    System.out.println("Enter the number of Yen : ");
                    value = input.nextDouble();
```

```
                    System.out.println("INR =
"+objCurrency.yenToINR(value));
                    break;
                default:
                    System.out.println("Invalid Input.");
                    break;
            }
            break;

        case 3:
            timeConverter objTime = new timeConverter();
            System.out.println("Enter the Serial Number for the Type
of Conversion : ");
            System.out.println("1. Hours to Minutes.");
            System.out.println("2. Minutes to Hours.");
            System.out.println("3. Minutes to Seconds.");
            System.out.println("4. Seconds to Minutes.");
            System.out.println("5. Hours to Seconds");
            System.out.println("6. Seconds to Hours.");
            subChoice = input.nextInt();
            switch (subChoice) {
                case 1:
                    System.out.println("Enter the number of Hours : ");
                    value = input.nextDouble();
                    System.out.println("Minutes =
"+objTime.hoursToMinutes(value));
```

```
                    break;
                case 2:
                    System.out.println("Enter the number of Minutes :
");
                    value = input.nextDouble();
                    System.out.println("Hours =
"+objTime.minutesToHours(value));
                    break;
                case 3:
                    System.out.println("Enter the number of Minutes :
");
                    value = input.nextDouble();
                    System.out.println("Seconds =
"+objTime.minutesToSeconds(value));
                    break;
                case 4:
                    System.out.println("Enter the number of Seconds :
");
                    value = input.nextDouble();
                    System.out.println("Minutes =
"+objTime.secondsToMinutes(value));
                    break;
                case 5:
                    System.out.println("Enter the number of Hours : ");
                    value = input.nextDouble();
                    System.out.println("Seconds =
"+objTime.hoursToSeconds(value));
```

```
                    break;
                case 6:
                    System.out.println("Enter the number of Seconds :
");
                    value = input.nextDouble();
                    System.out.println("Hours =
"+objTime.secondsToHours(value));
                    break;
                default:
                    System.err.println("Invalid Input.");
                    break;
            }
            break;

        case 4:
            System.err.println("Exiting...");
            loopController = false;
            break;
        default:
            System.out.println("Invalid Input.");
            break;
      }
    }
  }
}
```

OUTPUT:

```
ashwin_vp@Ubuntu:~/Desktop$ javac Java/Lab2/*.java
ashwin_vp@Ubuntu:~/Desktop$ java Java.Lab2.lab2
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
1
Enter the Serial Number for the Type of Conversion :
1. Miles to Kilometers.
2. Kilometers to Miles.
1
Enter the number of Miles :
80
Kilometers = 128.72
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
1
Enter the Serial Number for the Type of Conversion :
1. Miles to Kilometers.
2. Kilometers to Miles.
2
Enter the number of Kilometers :
80
Miles = 49.68
```

```
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
2
Enter the Serial Number for the Type of Conversion :
1. INR to Dollars.
2. Dollars to INR.
3. INR to Euro.
4. Euro to INR.
5. INR to Yen.
6. Yen to INR.
1
Enter the number of INR :
100
Dollars = 1.2
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
2
Enter the Serial Number for the Type of Conversion :
1. INR to Dollars.
2. Dollars to INR.
3. INR to Euro.
4. Euro to INR.
5. INR to Yen.
6. Yen to INR.
2
Enter the number of Dollars :
100
INR = 8372.0
```

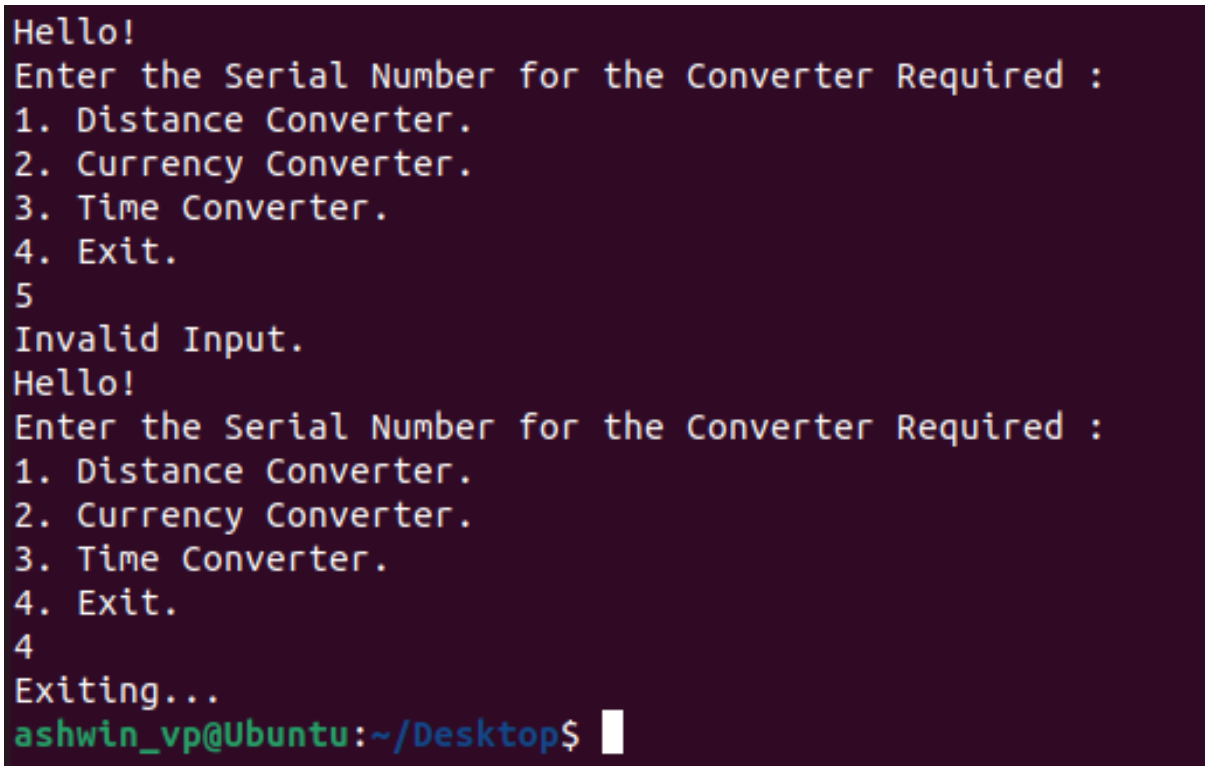
```
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
2
Enter the Serial Number for the Type of Conversion :
1. INR to Dollars.
2. Dollars to INR.
3. INR to Euro.
4. Euro to INR.
5. INR to Yen.
6. Yen to INR.
3
Enter the number of INR :
100
Euro = 1.0999999999999999
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
2
Enter the Serial Number for the Type of Conversion :
1. INR to Dollars.
2. Dollars to INR.
3. INR to Euro.
4. Euro to INR.
5. INR to Yen.
6. Yen to INR.
4
Enter the number of Euro :
100
INR = 9096.0
```

```
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
2
Enter the Serial Number for the Type of Conversion :
1. INR to Dollars.
2. Dollars to INR.
3. INR to Euro.
4. Euro to INR.
5. INR to Yen.
6. Yen to INR.
5
Enter the number of INR :
100
Yen = 183.0
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
2
Enter the Serial Number for the Type of Conversion :
1. INR to Dollars.
2. Dollars to INR.
3. INR to Euro.
4. Euro to INR.
5. INR to Yen.
6. Yen to INR.
6
Enter the number of Yen :
100
INR = 55.00000000000001
```

```
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
3
Enter the Serial Number for the Type of Conversion :
1. Hours to Minutes.
2. Minutes to Hours.
3. Minutes to Seconds.
4. Seconds to Minutes.
5. Hours to Seconds
6. Seconds to Hours.
1
Enter the number of Hours :
10
Minutes = 600.0
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
3
Enter the Serial Number for the Type of Conversion :
1. Hours to Minutes.
2. Minutes to Hours.
3. Minutes to Seconds.
4. Seconds to Minutes.
5. Hours to Seconds
6. Seconds to Hours.
2
Enter the number of Minutes :
100
Hours = 1.67
```

```
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
3
Enter the Serial Number for the Type of Conversion :
1. Hours to Minutes.
2. Minutes to Hours.
3. Minutes to Seconds.
4. Seconds to Minutes.
5. Hours to Seconds
6. Seconds to Hours.
3
Enter the number of Minutes :
100
Seconds = 6000.0
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
3
Enter the Serial Number for the Type of Conversion :
1. Hours to Minutes.
2. Minutes to Hours.
3. Minutes to Seconds.
4. Seconds to Minutes.
5. Hours to Seconds
6. Seconds to Hours.
5
Enter the number of Hours :
100
Seconds = 360000.0
```

```
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
3
Enter the Serial Number for the Type of Conversion :
1. Hours to Minutes.
2. Minutes to Hours.
3. Minutes to Seconds.
4. Seconds to Minutes.
5. Hours to Seconds
6. Seconds to Hours.
4
Enter the number of Seconds :
100
Minutes = 1.67
Hello!
Enter the Serial Number for the Converter Required :
1. Distance Converter.
2. Currency Converter.
3. Time Converter.
4. Exit.
3
Enter the Serial Number for the Type of Conversion :
1. Hours to Minutes.
2. Minutes to Hours.
3. Minutes to Seconds.
4. Seconds to Minutes.
5. Hours to Seconds
6. Seconds to Hours.
6
Enter the number of Seconds :
100
Hours = 0.0278
```



RESULT:

Thus, a Java application to calculate and display the electricity bill for a consumer based on the type of EB connection (domestic or commercial) and the number of units consumed is successfully created.