Exercise 2

Hariesh R - 23110344

Aim:

The aim is to develop a Java application that performs conversions for currency (Dollar, Euro, and Yen to INR and vice versa), distance (meters to kilometers, miles to kilometers, and vice versa), and time (hours to minutes, seconds, and vice versa), utilizing packages for better organization and modularity.

Algorithm:

1. Package converter.currency
    a. Start
    b. Define the currency_converter class in Exercise2.converter.currency.
    c. Implement conversion methods:
        i. dollar_to_inr(value): Return value * 83.73.
        ii. inr_to_dollar(value): Return value * 0.012.
        iii. euro_to_inr(value): Return value * 90.86.
        iv. inr_to_euro(value): Return value * 0.011.
        v. yen_to_inr(value): Return value * 0.54.
        vi. inr_to_yen(value): Return value * 1.84.
    d. End

2. Package converter.distance
    a. Start
    b. Define the distance_converter class in Exercise2.converter.distance.
    c. Implement conversion methods:

i. meter_to_km(value): Return value * 0.001.

ii. km_to_meter(value): Return value * 1000.

iii. mile_to_km(value): Return value * 1.60934.

iv. km_to_mile(value): Return value * 0.621371.

d. End

3. Package converter.time

a. Start

b. Define the time_converter class in Exercise2.converter.time.

c. Implement conversion methods:

i. hour_to_minutes(value): Return value * 60.
ii. minute_to_hour(value): Return value / 60.
iii. hour_to_second(value): Return value * 3600.
iv. second_to_hour(value): Return value / 3600.
v. minute_to_second(value): Return value * 60.
vi. second_to_minute(value): Return value / 60.

d. End

4. Package main_program

a. Start

b. Import necessary classes.

c. Create main_program class with main method:
   i. Initialize a Scanner for user input.
   ii. Set exit flag to false.

d. Loop until exit is true:
   i. Display main menu options.
   ii. Get user's choice.

e. Handle user choice:

f. Case 1: Currency Converter

    i. Display currency options.
    ii. Get conversion choice and amount.
    iii. Perform conversion based on choice.
    iv. Print converted amount.

g. Case 2: Distance Converter

    i. Display distance options.
    ii. Get conversion choice and amount.
    iii. Perform conversion based on choice.
    iv. Print converted distance.

h. Case 3: Time Converter

    i. Display time options.
    ii. Get conversion choice and amount.
    iii. Perform conversion based on choice.
    iv. Print converted time.

i. Case 4: Exit

    i. Print exit message.
    ii. Set exit to true and close Scanner.

j. Default:
    i. Print "Invalid choice" message.

k. End

Source Code:

1. Package converter.currency:

```
package Exercise2.converter.currency;

public class currency_converter {

   public static double dollar_to_inr(double value){

      return value * 83.73;
   }
```

```
    public static double inr_to_dollar(double value){

        return value * 0.012;
    }

    public static double euro_to_inr(double value){

        return value * 90.86;
    }

    public static double inr_to_euro(double value){

        return value * 0.011;
    }

    public static double yen_to_inr(double value){

        return value * 0.54;
    }

    public static double inr_to_yen(double value){

        return value * 1.84;
    }
}
```

2. Package converter.distance

```
package Exercise2.converter.distance;

public class distance_converter {

    public static double meter_to_km(double value){

        return value * 0.001;
    }

    public static double km_to_meter(double value){

        return value * 1000;
    }

    public static double mile_to_km(double value){

        return value * 1.60934;
```

```
    }

    public static double km_to_mile(double value){

        return value * 0.621371;
    }
}
```

3. Package converter.time

```
package Exercise2.converter.time;

public class time_converter {

    public static double hour_to_minutes(double value){

        return value * 60;
    }

    public static double minute_to_hour(double value){

        return value / 60;
    }

    public static double hour_to_second(double value){

        return value * 3600;
    }

    public static double second_to_hour(double value){

        return value / 3600;
    }

    public static double minute_to_second(double value){

        return value * 60;
    }

    public static double second_to_minute(double value){

        return value / 60;
    }
}
```

4. Package main_program

```
package Exercise2.main_program;

import Exercise2.converter.currency.currency_converter;
import Exercise2.converter.distance.distance_converter;
import Exercise2.converter.time.time_converter;

import java.util.Scanner;

public class main_program {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        boolean exit = false;

        while (!exit) {

            System.out.println("Select conversion type:");
            System.out.println("1. Currency Converter");
            System.out.println("2. Distance Converter");
            System.out.println("3. Time Converter");
            System.out.println("4. Exit");
            System.out.print("Enter your choice: ");
            int choice = scanner.nextInt();

            switch (choice) {

                case 1:
                    System.out.println("Currency Converter:");
                    System.out.println("1. Dollar to INR");
                    System.out.println("2. INR to Dollar");
                    System.out.println("3. Euro to INR");
                    System.out.println("4. INR to Euro");
                    System.out.println("5. Yen to INR");
                    System.out.println("6. INR to Yen");

                    System.out.print("Enter your choice: ");
                    int currencyChoice = scanner.nextInt();

                    System.out.print("Enter amount to convert: ");
                    double amount = scanner.nextDouble();

                    double convertedAmount = 0;
```

```
    switch (currencyChoice) {

        case 1:
            convertedAmount = currency_converter.dollar_to_inr(amount);
            break;

        case 2:
            convertedAmount = currency_converter.inr_to_dollar(amount);
            break;

        case 3:
            convertedAmount = currency_converter.euro_to_inr(amount);
            break;

        case 4:
            convertedAmount = currency_converter.inr_to_euro(amount);
            break;

        case 5:
            convertedAmount = currency_converter.yen_to_inr(amount);
            break;

        case 6:
            convertedAmount = currency_converter.inr_to_yen(amount);
            break;
    }

    System.out.println("Amount converted: " + convertedAmount);
    break;

case 2:
    System.out.println("Distance Converter:");
    System.out.println("1. Meter to KM");
    System.out.println("2. KM to Meter");
    System.out.println("3. Miles to KM");
    System.out.println("4. KM to Miles");

    System.out.print("Enter your choice: ");
    int distanceChoice = scanner.nextInt();

    System.out.print("Enter amount to convert: ");
    double distance = scanner.nextDouble();
    double convertedDistance = 0;

    switch (distanceChoice) {
```

```
            case 1:
                convertedDistance = distance_converter.meter_to_km(distance);
                break;

            case 2:
                convertedDistance = distance_converter.km_to_meter(distance);
                break;

            case 3:
                convertedDistance = distance_converter.mile_to_km(distance);
                break;

            case 4:
                convertedDistance = distance_converter.km_to_mile(distance);
                break;
        }

        System.out.println("Distance converted: " + convertedDistance);
        break;

    case 3:
        System.out.println("Time Converter:");
        System.out.println("1. Hour to Minute");
        System.out.println("2. Minute to Hour");
        System.out.println("3. Hour to Second");
        System.out.println("4. Second to Hour");
        System.out.println("5. Minute to Second");
        System.out.println("6. Second to Minute");

        System.out.print("Enter your choice: ");
        int timeChoice = scanner.nextInt();

        System.out.print("Enter amount to convert: ");
        double time = scanner.nextDouble();
        double convertedTime = 0;

        switch (timeChoice) {

            case 1:
                convertedTime = time_converter.hour_to_minutes(time);
                break;

            case 2:
                convertedTime = time_converter.minute_to_hour(time);
                break;
```

```
                    case 3:
                        convertedTime = time_converter.hour_to_second(time);
                        break;

                    case 4:
                        convertedTime = time_converter.second_to_hour(time);
                        break;

                    case 5:
                        convertedTime = time_converter.minute_to_second(time);
                        break;

                    case 6:
                        convertedTime = time_converter.second_to_minute(time);
                        break;
                }

                System.out.println("Time converted: " + convertedTime);
                break;

            case 4:
                System.out.println("Exited !");
                exit = true;
                scanner.close();
                break;

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

Output:

```
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 1
Currency Converter:
1. Dollar to INR
2. INR to Dollar
3. Euro to INR
4. INR to Euro
5. Yen to INR
6. INR to Yen
Enter your choice: 1
Enter amount to convert: 5
Amount converted: 418.65000000000003
```

```
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 1
Currency Converter:
1. Dollar to INR
2. INR to Dollar
3. Euro to INR
4. INR to Euro
5. Yen to INR
6. INR to Yen
Enter your choice: 6
Enter amount to convert: 675
Amount converted: 1242.0
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 2
Distance Converter:
1. Meter to KM
2. KM to Meter
3. Miles to KM
4. KM to Miles
Enter your choice: 2
Enter amount to convert: 8
Distance converted: 8000.0
```

```
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 2
Distance Converter:
1. Meter to KM
2. KM to Meter
3. Miles to KM
4. KM to Miles
Enter your choice: 4
Enter amount to convert: 23
Distance converted: 14.291533
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 3
Time Converter:
1. Hour to Minute
2. Minute to Hour
3. Hour to Second
4. Second to Hour
5. Minute to Second
6. Second to Minute
Enter your choice: 3
Enter amount to convert: 5
Time converted: 18000.0
```

```
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 3
Time Converter:
1. Hour to Minute
2. Minute to Hour
3. Hour to Second
4. Second to Hour
5. Minute to Second
6. Second to Minute
Enter your choice: 6
Enter amount to convert: 500
Time converted: 8.333333333333334
Select conversion type:
1. Currency Converter
2. Distance Converter
3. Time Converter
4. Exit
Enter your choice: 4
Exited !

Process finished with exit code 0
```

Result:

The Java application performs currency, distance, and time conversions. It converts between Dollar, Euro, Yen, and INR; meters, kilometers, and miles; and hours, minutes, and seconds. Users select the conversion type and input values via a command-line menu, and the program provides the converted results, all organized into separate packages for modularity.