CIS 36B – 8th Class / Lab Assignment – **10 Points-**
Student Name KachiLau Student ID 10819338 Point Total

Section 1: Define / Answer

Describe the difference between an **Error** in Java and an **Exception.**

Errors should not be caught or handled (except in the rarest of cases). Exceptions are the bread and butter of exception handling.

Describe the difference between **Checked Exceptions** and **Unchecked Exceptions**

Checked: are the exceptions that are checked at compile time. If some code within a method throws a checked exception, then the method must either handle the exception or it must specify the exception using throws keyword.

Unchecked are the exceptions that are not checked at compiled time.

Give a few examples of **Checked Exceptions.**

```
class Main {
    public static void main(String[] args) {
        FileReader file = new FileReader("C:¥¥test¥¥a.txt");
        BufferedReader fileInput = new BufferedReader(file);

        // Print first 3 lines of file "C:¥test¥a.txt"
        for (int counter = 0; counter < 3; counter++)
            System.out.println(fileInput.readLine());

        fileInput.close();
    }
}
```

Output:

```
Exception in thread "main" java.lang.RuntimeException: Uncompilable source code -
unreported exception java.io.FileNotFoundException; must be caught or declared to
be
thrown
        at Main.main(Main.java:5)
```

Give a few examples of **Unchecked Exceptions.**

```
class Main {
   public static void main(String args[]) {
      int x = 0;
      int y = 10;
      int z = y/x;
  }
}
```

Output:

```
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at Main.main(Main.java:5)
Java Result: 1
```

Describe basic structure of

try{

}

Catch

{

}

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finally

A try statement is used to catch exceptions that might be thrown as your program executes. You should use a try statement whenever you use a statement that might throw an exception That way, your program won't crash if the exception occurs.

The `finally` block *always* executes when the `try` block exits. This ensures that the`finally` block is executed even if an unexpected exception occurs. But `finally` is useful for more than just exception handling — it allows the programmer to avoid having cleanup code accidentally bypassed by a `return`, `continue`, or `break`. Putting cleanup code in a`finally` block is always a good practice, even when no exceptions are anticipated.

When to use **throws** vs **try/catch**?

Before you can catch an exception, some code somewhere must throw one. Any code can throw an exception: your code, code from a package written by someone else such as the packages that come with the Java platform, or the Java runtime environment. Regardless of what throws the exception, it's always thrown with the `throw` statement.

You associate exception handlers with a `try` block by providing one or more `catch` blocks directly after the `try` block. No code can be between the end of the `try` block and the beginning of the first `catch` block.

Task 1-

USE OBJECT ORIENTATED PROGRAM DESIGN TO SOLVE PROBLEM

Change assignment #5

Complete the program with nested menus.

First provide a menu giving the user the opportunity to select the vehicle type first.

Then provide a second menu to allow the user to input values to calculate range.

The program should not crash no matter the user input. Deal with all unexpected input.

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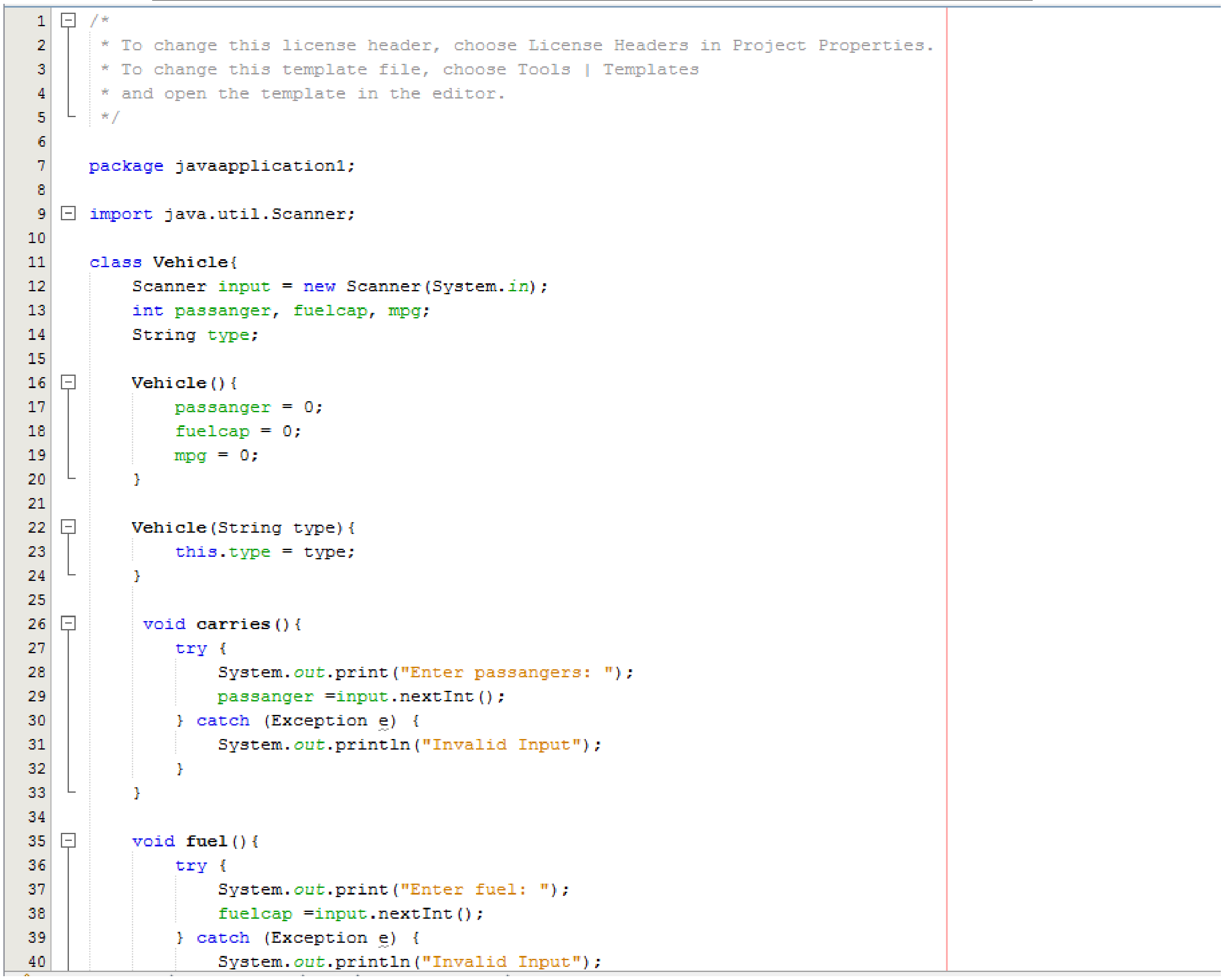

```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */

package javaapplication1;

import java.util.Scanner;

class Vehicle{
    Scanner input = new Scanner(System.in);
    int passanger, fuelcap, mpg;
    String type;

    Vehicle(){
        passanger = 0;
        fuelcap = 0;
        mpg = 0;
    }

    Vehicle(String type){
        this.type = type;
    }

     void carries(){
        try {
            System.out.print("Enter passangers: ");
            passanger =input.nextInt();
        } catch (Exception e) {
            System.out.println("Invalid Input");
        }
    }

    void fuel(){
        try {
            System.out.print("Enter fuel: ");
            fuelcap =input.nextInt();
        } catch (Exception e) {
            System.out.println("Invalid Input");
```

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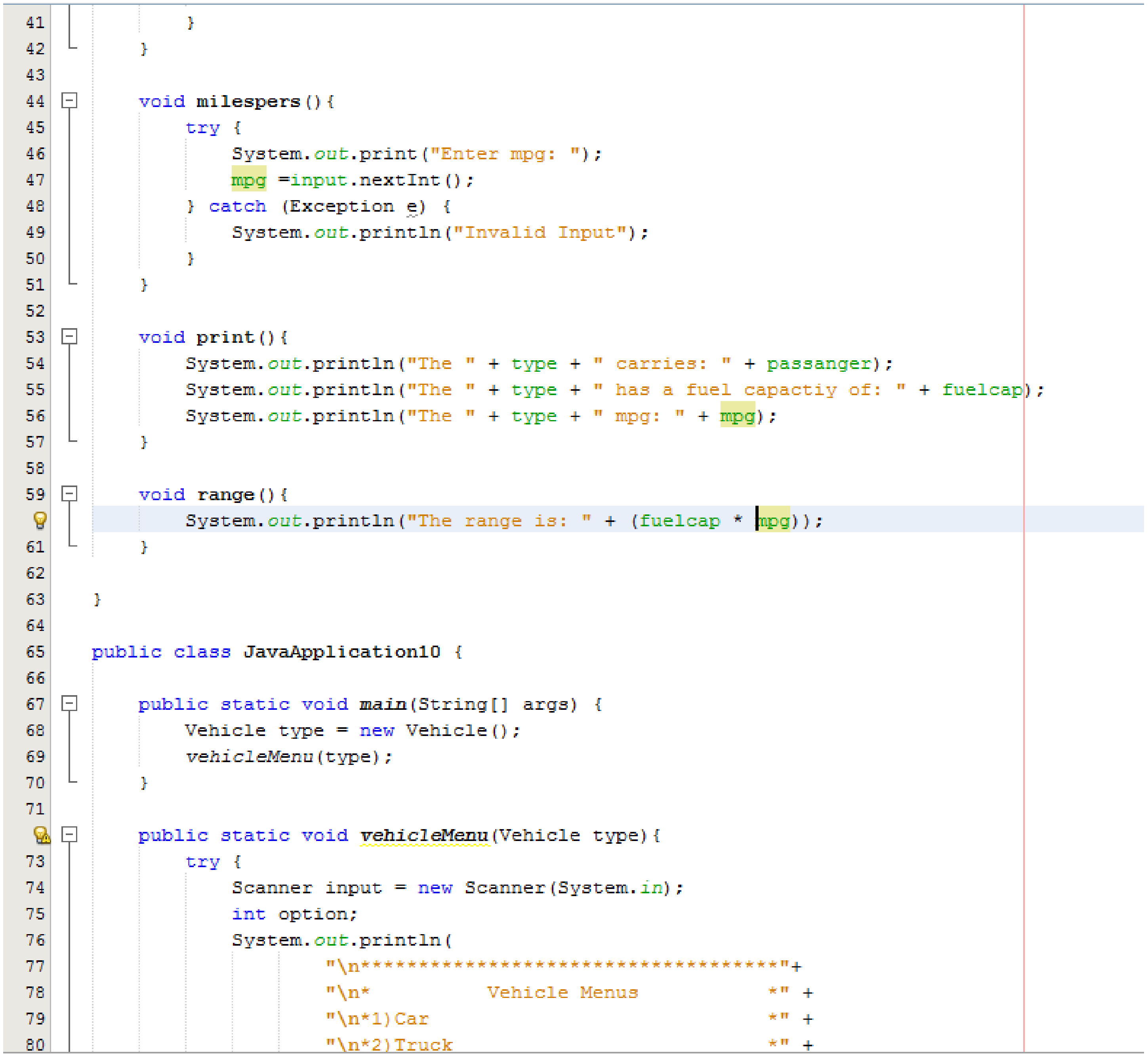

```
            }
        }

        void milespers(){
            try {
                System.out.print("Enter mpg: ");
                mpg =input.nextInt();
            } catch (Exception e) {
                System.out.println("Invalid Input");
            }
        }

        void print(){
            System.out.println("The " + type + " carries: " + passanger);
            System.out.println("The " + type + " has a fuel capactiy of: " + fuelcap);
            System.out.println("The " + type + " mpg: " + mpg);
        }

        void range(){
            System.out.println("The range is: " + (fuelcap * mpg));
        }

    }

    public class JavaApplication10 {

        public static void main(String[] args) {
            Vehicle type = new Vehicle();
            vehicleMenu(type);
        }

        public static void vehicleMenu(Vehicle type){
            try {
                Scanner input = new Scanner(System.in);
                int option;
                System.out.println(
                        "\n***************************************"+
                        "\n*          Vehicle Menus             *" +
                        "\n*1)Car                               *" +
                        "\n*2)Truck                             *" +
```

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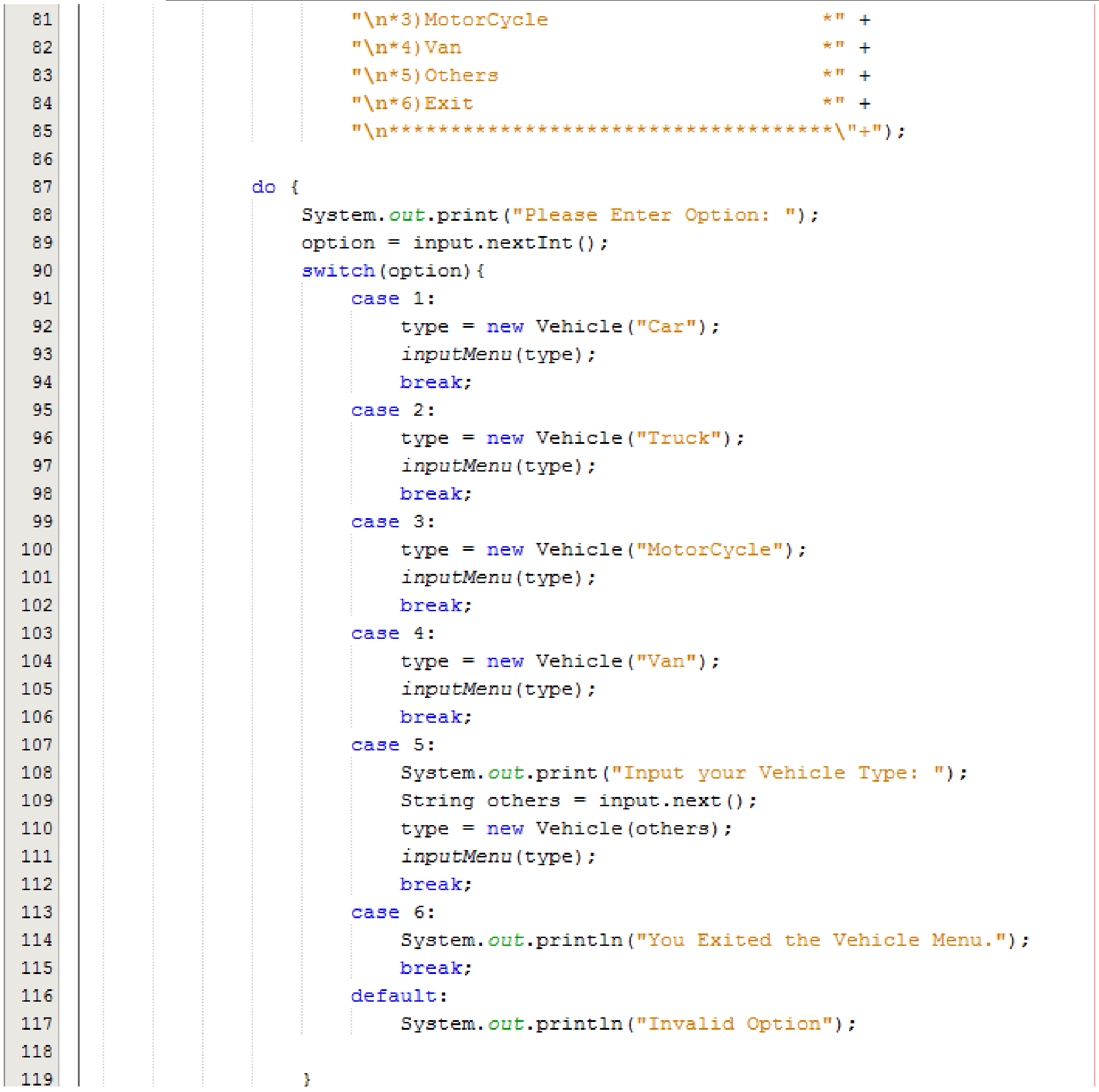

```
                    "\n*3)MotorCycle                       *" +
                    "\n*4)Van                              *" +
                    "\n*5)Others                           *" +
                    "\n*6)Exit                             *" +
                    "\n************************************\"+");

            do {
                System.out.print("Please Enter Option: ");
                option = input.nextInt();
                switch(option){
                    case 1:
                        type = new Vehicle("Car");
                        inputMenu(type);
                        break;
                    case 2:
                        type = new Vehicle("Truck");
                        inputMenu(type);
                        break;
                    case 3:
                        type = new Vehicle("MotorCycle");
                        inputMenu(type);
                        break;
                    case 4:
                        type = new Vehicle("Van");
                        inputMenu(type);
                        break;
                    case 5:
                        System.out.print("Input your Vehicle Type: ");
                        String others = input.next();
                        type = new Vehicle(others);
                        inputMenu(type);
                        break;
                    case 6:
                        System.out.println("You Exited the Vehicle Menu.");
                        break;
                    default:
                        System.out.println("Invalid Option");

                }
```

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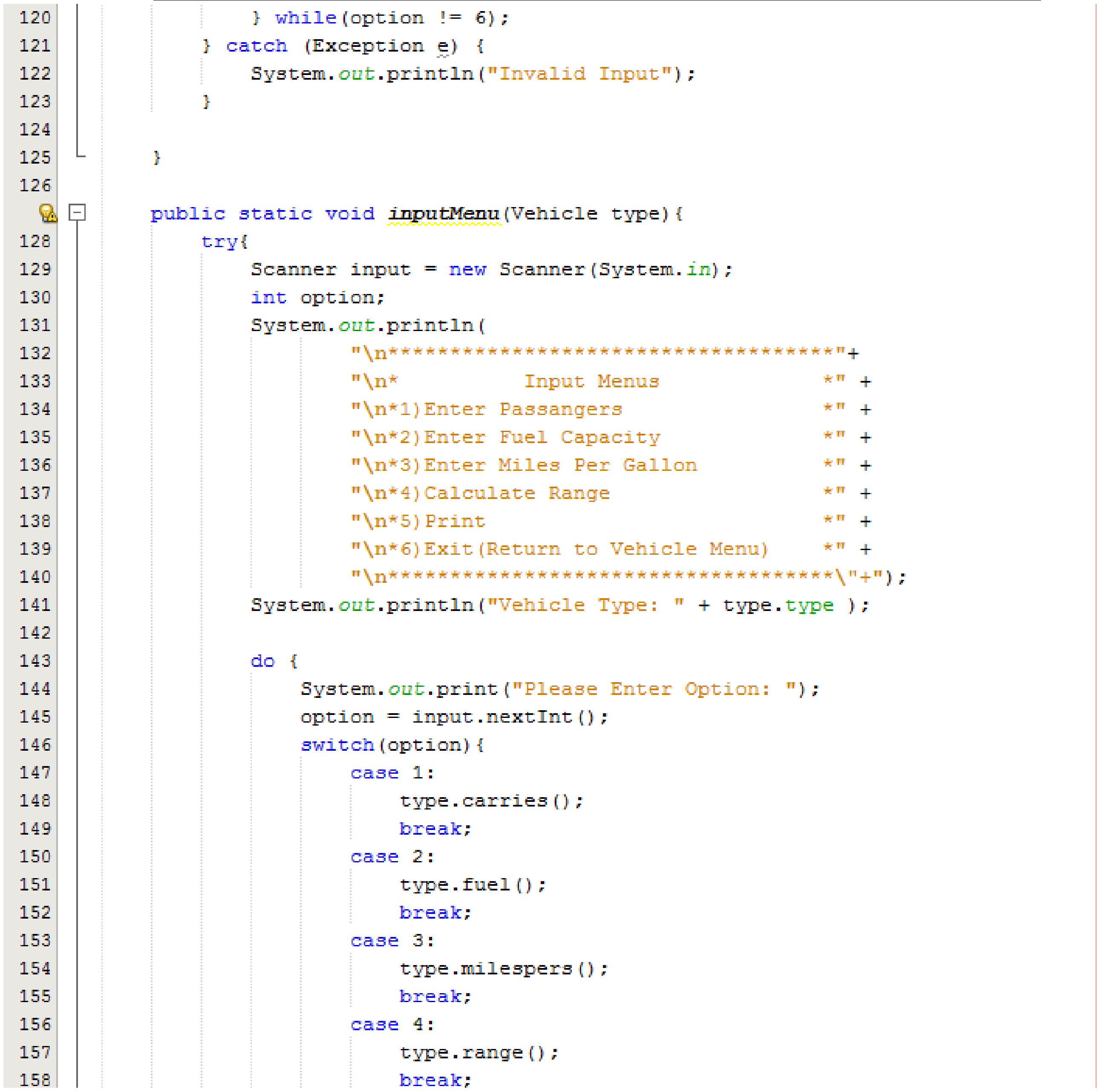
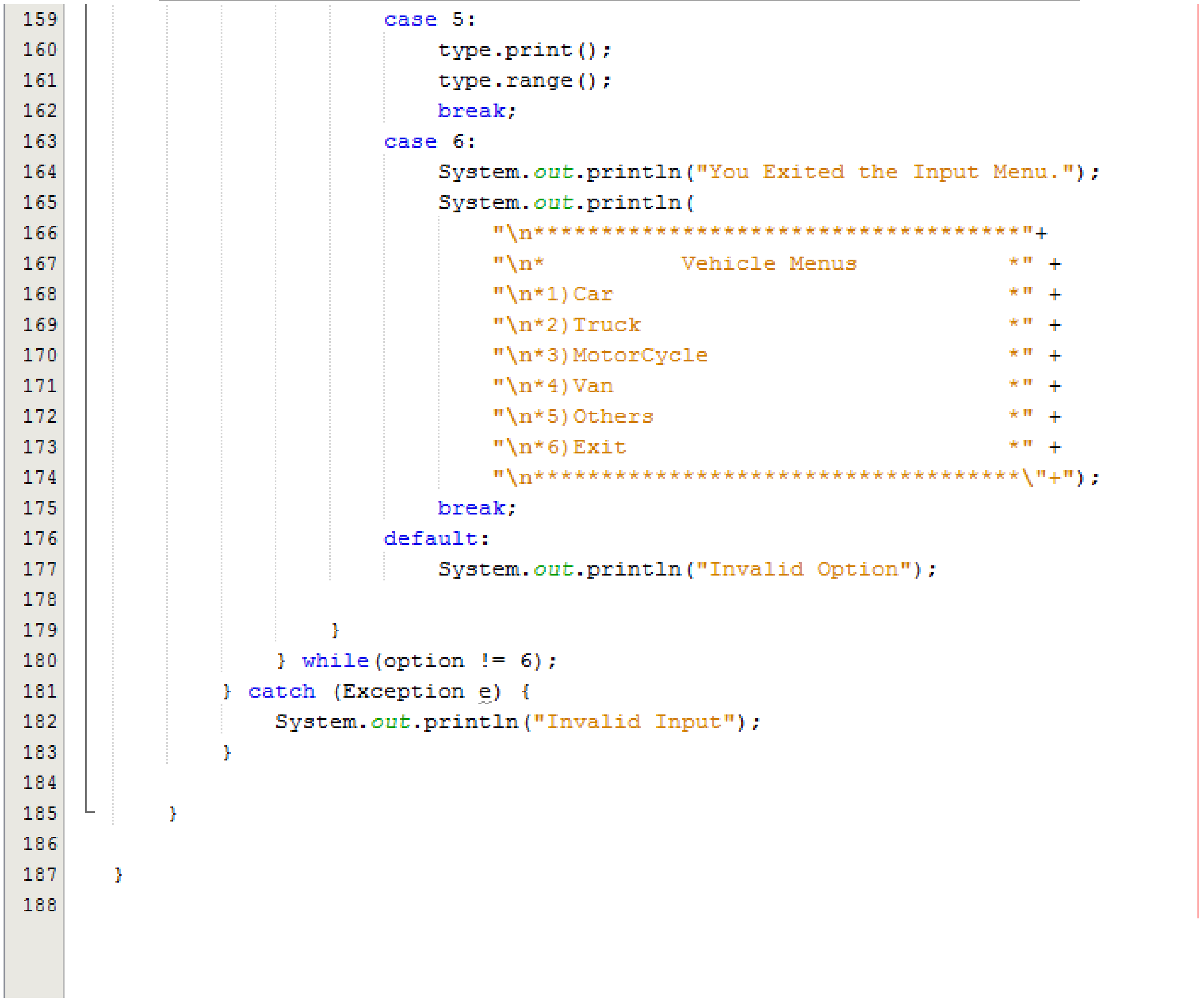


```java
            } while(option != 6);
        } catch (Exception e) {
            System.out.println("Invalid Input");
        }

    }

    public static void inputMenu(Vehicle type){
        try{
            Scanner input = new Scanner(System.in);
            int option;
            System.out.println(
                    "\n************************************"+
                    "\n*          Input Menus             *" +
                    "\n*1)Enter Passangers                *" +
                    "\n*2)Enter Fuel Capacity             *" +
                    "\n*3)Enter Miles Per Gallon          *" +
                    "\n*4)Calculate Range                 *" +
                    "\n*5)Print                           *" +
                    "\n*6)Exit(Return to Vehicle Menu)    *" +
                    "\n************************************\"+");
            System.out.println("Vehicle Type: " + type.type );

            do {
                System.out.print("Please Enter Option: ");
                option = input.nextInt();
                switch(option){
                    case 1:
                        type.carries();
                        break;
                    case 2:
                        type.fuel();
                        break;
                    case 3:
                        type.milespers();
                        break;
                    case 4:
                        type.range();
                        break;
```



```
                    case 5:
                        type.print();
                        type.range();
                        break;
                    case 6:
                        System.out.println("You Exited the Input Menu.");
                        System.out.println(
                            "\n************************************"+
                            "\n*          Vehicle Menus           *" +
                            "\n*1)Car                             *" +
                            "\n*2)Truck                           *" +
                            "\n*3)MotorCycle                      *" +
                            "\n*4)Van                             *" +
                            "\n*5)Others                          *" +
                            "\n*6)Exit                            *" +
                            "\n************************************\"+");
                        break;
                    default:
                        System.out.println("Invalid Option");

                }
            } while(option != 6);
        } catch (Exception e) {
            System.out.println("Invalid Input");
        }

    }

}
```

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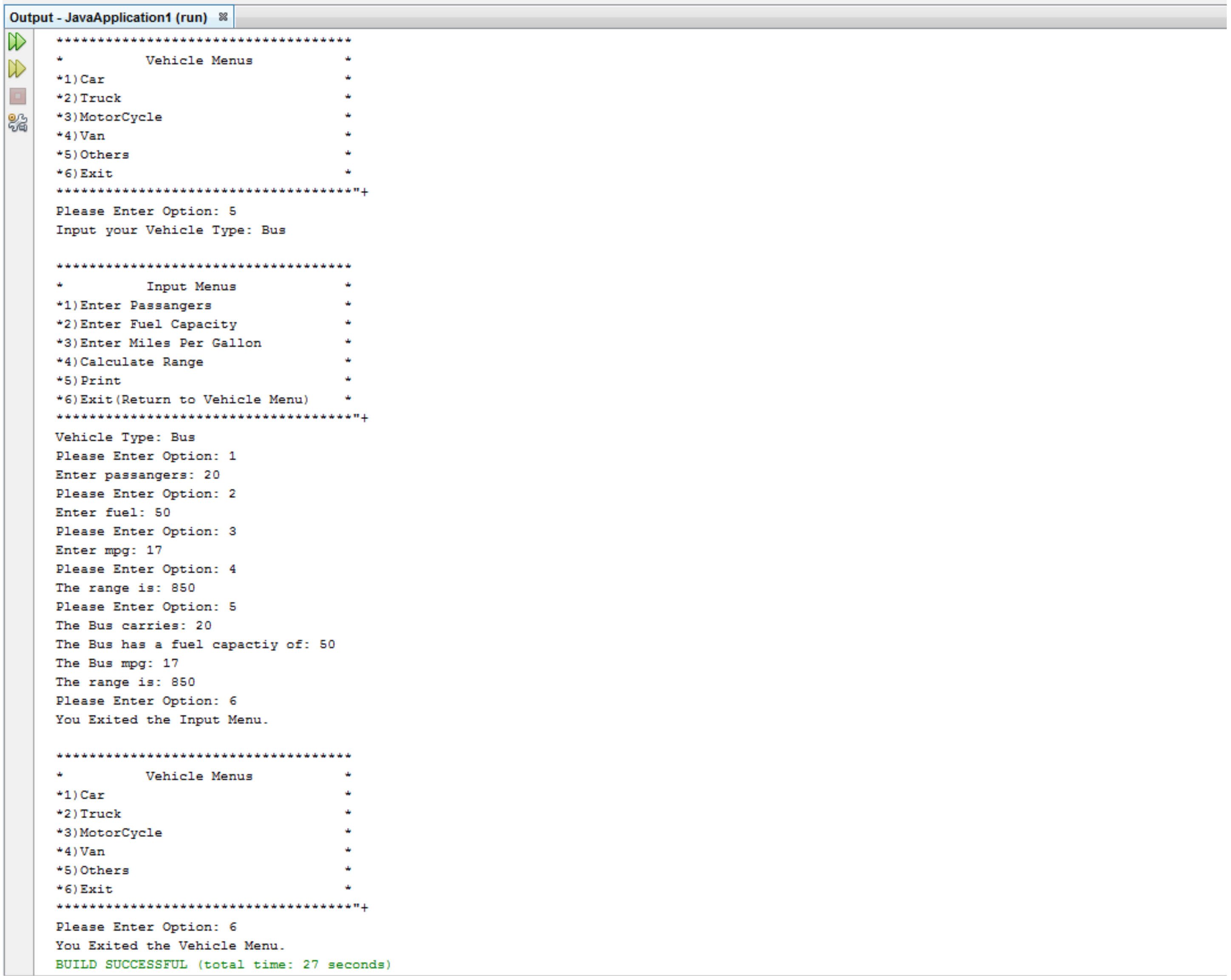

```
*************************************
*           Vehicle Menus           *
*1)Car                              *
*2)Truck                            *
*3)MotorCycle                       *
*4)Van                              *
*5)Others                           *
*6)Exit                             *
************************************"+
Please Enter Option: 5
Input your Vehicle Type: Bus

*************************************
*           Input Menus             *
*1)Enter Passangers                 *
*2)Enter Fuel Capacity              *
*3)Enter Miles Per Gallon           *
*4)Calculate Range                  *
*5)Print                            *
*6)Exit(Return to Vehicle Menu)     *
************************************"+
Vehicle Type: Bus
Please Enter Option: 1
Enter passangers: 20
Please Enter Option: 2
Enter fuel: 50
Please Enter Option: 3
Enter mpg: 17
Please Enter Option: 4
The range is: 850
Please Enter Option: 5
The Bus carries: 20
The Bus has a fuel capactiy of: 50
The Bus mpg: 17
The range is: 850
Please Enter Option: 6
You Exited the Input Menu.

*************************************
*           Vehicle Menus           *
*1)Car                              *
*2)Truck                            *
*3)MotorCycle                       *
*4)Van                              *
*5)Others                           *
*6)Exit                             *
************************************"+
Please Enter Option: 6
You Exited the Vehicle Menu.
BUILD SUCCESSFUL (total time: 27 seconds)
```

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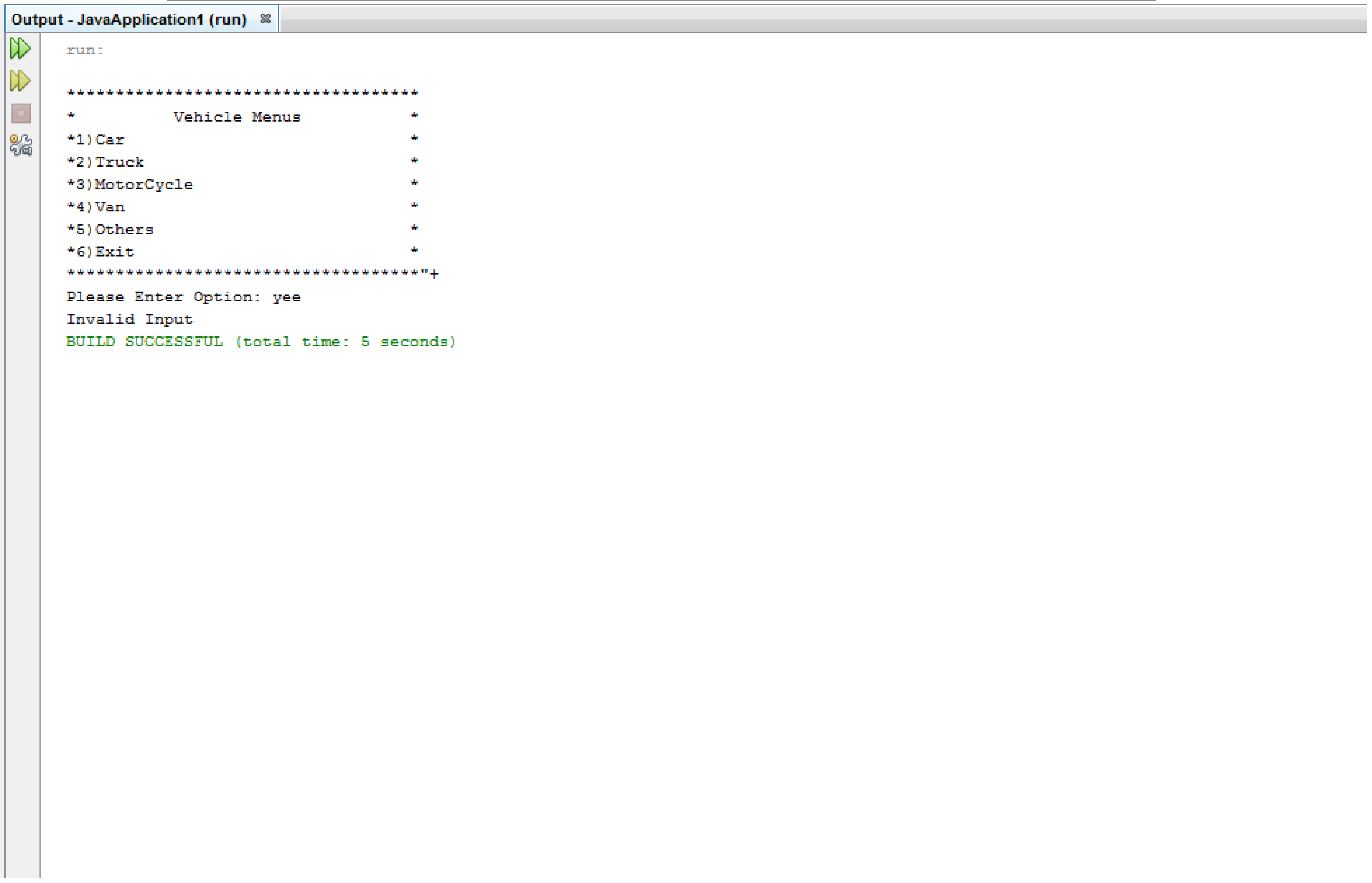

```
run:

*************************************
*           Vehicle Menus           *
*1)Car                              *
*2)Truck                            *
*3)MotorCycle                       *
*4)Van                              *
*5)Others                           *
*6)Exit                             *
*************************************"+
Please Enter Option: yee
Invalid Input
BUILD SUCCESSFUL (total time: 5 seconds)
```

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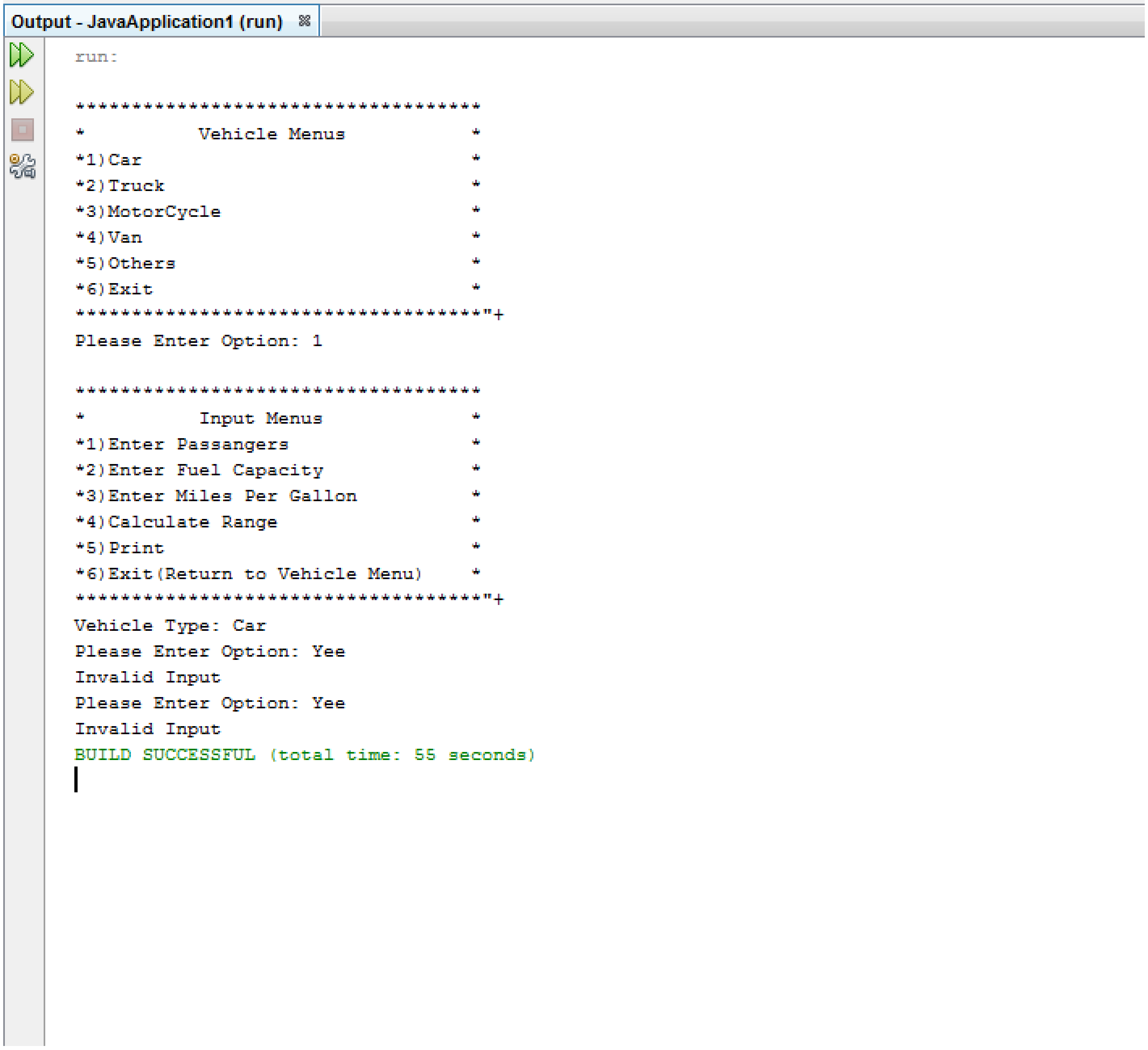

```
run:

**************************************
*           Vehicle Menus            *
*1)Car                               *
*2)Truck                             *
*3)MotorCycle                        *
*4)Van                               *
*5)Others                            *
*6)Exit                              *
**************************************"+
Please Enter Option: 1

**************************************
*           Input Menus              *
*1)Enter Passangers                  *
*2)Enter Fuel Capacity               *
*3)Enter Miles Per Gallon            *
*4)Calculate Range                   *
*5)Print                             *
*6)Exit(Return to Vehicle Menu)      *
**************************************"+
Vehicle Type: Car
Please Enter Option: Yee
Invalid Input
Please Enter Option: Yee
Invalid Input
BUILD SUCCESSFUL (total time: 55 seconds)
```