WIA1002 Data Structure
Tutorial 4: Linked List

1. Create the ListNode.java and LinkedList.java file (only the methods required based on the lecture notes). Then, create a tester class that insert the following numbers into a linked list. (23.1, 36.5, 12.8, 42.6, 32.8).

   Example output:

   ```
   The number in the linked list
   23.1 --> 36.5 --> 12.8 --> 42.6 --> 32.8 -->
   ```

2. After that, add 10.5 for each number in the list that is more than 20. You need to add the required methods to the LinkedList.java file

   Example output:

   ```
   The number in the linked list after updated
   33.6 --> 47.0 --> 12.8 --> 53.1 --> 43.3 -->
   ```

3. The currency notes of a country consist of 100, 50, 20, 10, 5 and 1. Create the ListNode.java and LinkedList.java file (only the methods required based on the lecture notes). Then, create a tester class that insert the currency notes into a linked list. Then, write a program that convert the amount of money to the currency notes. Store the number of notes in another linked list.

   Example output:

   ```
   Enter the total amount: 1468
   Total amount: 1468
   MYR 100 : 14
   MYR 50 : 1
   MYR 20 : 0
   MYR 10 : 1
   MYR 5 : 1
   MYR 1 : 3
   ```

4. Modified the LinkedList.java file to include the following methods:
   a. Create a method that returns the sum of all Integers.
   b. Create a method that returns the number of even number.
   c. Write a program in the tester class that insert the following numbers into a linked list (23, 15, 17, 28, 12, 40). Then, display the sum of the numbers and the number of even number.

   Example output:

```
23 --> 15 --> 17 --> 28 --> 12 --> 40 -->
Linked List has 6 node(s)
Total is 135
Total even number is 3
```

5. Modified the LinkedList.java file to include the following methods:

   a. Create a method that generates random number based on arguments.
   b. Create a method that deletes the nodes that match the integer value given.
   c. Write a program in the tester class that generate 15 random numbers within 0 -
      10. Then, delete all the nodes where the number is equal to 4.

   Example output:

```
Linked List has 15 node(s)
10--> 6--> 7--> 7--> 0--> 9--> 4--> 10--> 10--> 5--> 5--> 8--> 4--> 10--> 9-->
Delete the number 4 from the list.

Linked List has 13 node(s)
10--> 6--> 7--> 7--> 0--> 9--> 10--> 10--> 5--> 5--> 8--> 10--> 9-->
```

6. Modified the LinkedList.java file to include the following methods:
   a. Create a method to insert node at the front.
   b. Create a method that returns the value of the middle element of a linked list.
   c. Write a program in the tester class that insert the following numbers into a
      linked list (78, 45, 34, 23, 17, 10, 8). Each number is added to the front
      position. Then, display the median.

   Example output:

```
8--> 10--> 17--> 23--> 34--> 45--> 78-->
The median is 23
```