CS357: Assignment 3 (100 points)
Due at 11:59 on May 4 (Monday)

Problem

Define and implement classes `Link` and `LinkedList` and use them in your program (Do not use the JAVA predefined class `java.util.LinkedList`). Class `LinkedList` should include methods for creating a linked-list, displaying a linked-list, and inserting and deleting links. Partial declaration of the classes is as follows.

```
class Link
{
   private int iData;
   private double dData;
   private Link next;

   // define necessary constructor(s) and methods
}

class LinkedList
{
   private Link head;

   // define necessary constructor(s)

   // define insertFirst method which insert a new link at the
   // beginning of the list

   // define insertAfter method which insert a new link after
   // a specific link

   // define find method which find link with given key

   // define deleteLast method which delete the last link,
   // assuming the list is not empty

   // define displayList method which display the list

   // define isEmpty method which returns TRUE if the list is
   // empty
}
```

The following are some example output when running the program.

```
C:\CS357>java Hw3
Input the number of links:
4
Enter the first value of the new link:
11
Enter the second value of the new link:
1.9
Enter the first value of the new link:
22
Enter the second value of the new link:
2.9
Enter the first value of the new link:
33
Enter the second value of the new link:
3.9
Enter the first value of the new link:
44
Enter the second value of the new link:
4.9
List (first-->last): {44, 4.9} {33, 3.9} {22, 2.9} {11, 1.9}
------------------------------
Enter the link you want to find:
33
Found link with key 33 and value 3.9
------------------------------
Delete the last link:
Deleted link with key 11
List (first-->last): {44, 4.9} {33, 3.9} {22, 2.9}
------------------------------
Enter the link after which you want to insert a new link:
44
Enter the first value of the new link:
55
Enter the second value of the new link:
5.9
List (first-->last): {44, 4.9} {55, 5.9} {33, 3.9} {22, 2.9}
```

```
C:\CS357>java Hw3
Input the number of links:
3
Enter the first value of the new link:
77
Enter the second value of the new link:
7.9
Enter the first value of the new link:
88
Enter the second value of the new link:
8.9
Enter the first value of the new link:
99
Enter the second value of the new link:
9.9
List (first-->last): {99, 9.9} {88, 8.9} {77, 7.9}
-----------------------------
Enter the link you want to find:
55
Can't find link
-----------------------------
Delete the last link:
Deleted link with key 77
List (first-->last): {99, 9.9} {88, 8.9}
-----------------------------
Enter the link you want to insert a new link after:
88
Enter the first value of the new link:
100
Enter the second value of the new link:
10.9
List (first-->last): {99, 9.9} {88, 8.9} {100, 10.9}
```

Other Requirements

- Your code should include comments (20 points)
- Your code should compile successfully (20 points)

Submission:

Submit your source code file (.java) on Blackboard.