ASSIGNMENT WEEK 6

A ***priority queue*** may be implemented using a linked list which stores the data and the priority. We will consider generic data and integer priority where lower values indicate higher priority (like for the Unix **`nice`** command).

For this assignment, you will implement four methods as outlined below ***in Java*** for submission.

1. Use the data structure **`LinkedList`** from the **`java.util`** library to store a custom class containing attributes **`data`** of generic type (to be determined at compile time) and **`priority`** of integer type.
2. Write two methods **`Insert`** with the following signatures: **`Insert(data, priority)`** and **`Insert(data)`**, where the latter assumes a default priority of 19. Your method will find the place in the linked list to insert the new node such that subsequent nodes have priorities that are not less than the new priority. The head of the linked list ***must have*** the minimum priority.
3. Write a method **`Del_Min()`** which removes the head of the linked list and returns its data value (if non-empty).
4. Write a method **`Decrease_Priority(data, k)`** which finds a node with **`data`** and decreases its priority (by **`k`**). Note that you may need to reestablish the correct order. This does not have to be implemented in the most efficient way.
5. Test and debug your methods. Provide test runs in form of a main file in which you create appropriate variables, fill the priority queue with data, and run some cases to show your methods work.

Modification of code provided during this course counts as “creating your own class”.

Each of the problems 1 – 5 will be graded according to the following rubric for a total of 20 points.

SCORE	**4**	**3**	**2**	**1**	**0**
SKILL LEVEL	Response gives evidence of a complete understanding of the problem; is fully developed; is clearly communicated.	Response gives the evidence of a clear understanding of the problem but contains minor errors or is not fully communicated.	Response gives evidence of a reasonable approach but indicates gaps in conceptual understanding. Explanations are incomplete, vague, or muddled.	Response gives some evidence of problem understanding but contains major math or reasoning errors.	No response or response is completely incorrect or irrelevant.