CS161: Introduction to Computer Science Homework Assignment 8

Due: 3/27 by 11:59pm

To Do Lists

In this assignment, you will implement a To-Do List application similar to the BookCase example we completed in class.

There are 3 Java classes for this assignment: ToDoItem, ToDoList, and Controller.

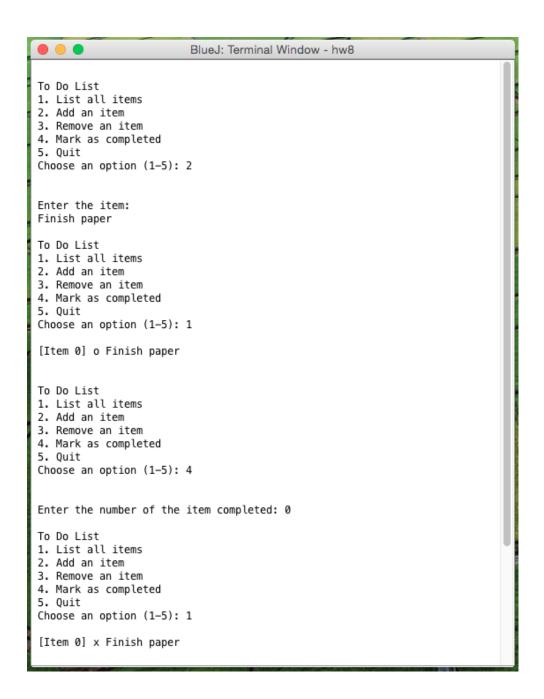
- 1. The ToDoItem class represents a single item on the to do list. This class should contain a piece of text. You should also keep track of whether the item has been completed or not. Add whatever methods to this class that you think are necessary.
- 2. The ToDoList class represents a list of to-do items. In addition to a constructor, the ToDoList class should have the following methods:
 - An addItem(String message) method that adds a new item to the list
 - A removeItem(int index) method that removes an item from the list
 - A markAsCompleted(int index) method that marks a given item as completed
 - A toString() method that returns a String representation of the list

Note that the removeItem and markAsCompleted methods take an integer representing an index into the list. You must check that the index passed in is a valid index into the list.

3. The Controller class should use a do-while loop and a switch statement to continuously print a menu of options for the user to choose from.

The only print statements from your program should come from the Controller class. In particular, the ToDoItem and ToDoList classes should not print anything to the screen.

An example interaction with my To Do List application is shown on the next page:



Note that I used 'o' and 'x' to indicate whether an item has been completed or not. Feel free to get creative and come up with your own design for displaying information to the user!

- 1	_				
	ΗV	ᅝ	nc	I	nc

Looking for additional challenges? Here are some interesting ways that you could extend this application:

- 1. Make a more realistic ToDoItem class. For example, you could allow the user to specify a priority of low, medium, or high for each item on the list.
- 2. Add methods to the ToDoList class that allow the user to promote or demote an item on the list i.e. to move an item up by one or down by one on the list. This would allow the user to order the list according to importance
- 3. Add methods to the ToDoList class that let the user print portions of the list e.g., print all items that have high priority or print all items whose note contains a certain word. For example, I might want to print all the items on the list that contain the word "cs161" to see what I need to do for this course.
- 4. A surprisingly difficult thing to do is to remove all completed tasks from the list. This would require a loop to iterate over all items in the list. However, as you're iterating over the list you are also changing the list (i.e. removing items from the list). This is known as *concurrent modification* you are concurrently traversing and deleting from the list. If you're interested in how to implement this functionality, let me know and I can give you some hints.

\sim			
Sty	ם וי	(_ 1	บปอ
ンしり	10	Vι	nuc

Finally, before you submit your assignment, go through the checklist below and make sure your code conforms to the style guide.

Checklist

☐ All unused variables are deleted	
\square All instance variables are used in more than	one method (if not, make them local)
☐ Javadoc comment for all classes	
\square All methods have Javadoc comments (except	ot for the main method)
☐ All numbers have been replaced with consta	ants (i.e. no magic numbers)
☐ Proper capitalization of variables, methods,	and classes
☐ Use white space to separate different section	ns of your code

Read the "Style Guide" (under "Resources" on the course website) for more information.

Submitting your homework assignment

You should submit your hw8 folder with your ToDoItem, ToDoList, and Controller class inside. Please rename your folder with both your first and last name before you zip it!