This assignment is due by **10pm on Monday October 9** and is worth 8 points.

1 Goals

The goal of this assignment is to get some practice thinking about how the complexity or efficiency of different implementations of an ADT can affect our choices of which implementation to use. You will also get some more practice thinking about how to use an implementation of the Stack ADT.

2 Setup and Requirements

This is a solo assignment. You may certainly discuss the assignment and how to get to your final solutions with your classmates, but you must write your own solution. Also, make sure to cite any sources used or classmates consulted! This is a written assignment, so no coding is required.

Your work should be typed, and must be a PDF. The easiest way to produce a PDF is to write your text in a text editor or a word processing program, then export or print it to PDF. On a Mac (such as the Macs in the lab), you can choose "Print" and then in the lower left corner there will be a "PDF" button. Click on that button and choose "Save as PDF". No format other than PDF is acceptable. If you are familiar with LATEX, the PDF created from that is also a good option.

3 Your Assignment

1. Suppose you are creating a software application that allows prospective college students to review and retrieve information about a group of colleges. You are going to use some implementation of the List ADT to store the list of colleges. In particular, you expect that your users will often want to retrieve information about a schools with a particular ranking or range of rankings (say they want to see information about the schools ranked in the range 15-30). It's not often that a new school will need to be added to the list of rankings or that a school will need to be removed from the list of rankings. Which implementation of the List ADT should your program use and why? (1-2 sentences).

2. The registrar's office has decided that it is time for a new software package to help manage the registration process and they have asked you for help. In particular, they want you to write an application that keeps track of the students on the waitlist for different classes. You need to be able to add students to the waitlist and remove students from the waitlist. In particular, you want to keep students in order on the waitlist so that the student who has been on the waitlist the longest will be the first to be removed from the waitlist when a space opens up in the class. You plan to use some implementation of the List ADT to complete your task. Which implementation of the List ADT should your program use and why? (1-2 sentences).

3. Why might a developer choose to implement a particular program using a singly linked-list over a doubly linked list? (1-2 sentences).

4. Suppose you have some mystery implementation of the Stack ADT that allows you to create new Stack objects using the following line of code. `Stack s = new MysteryStackImp()`.

This mystery implementation of the Stack ADT gives you access to all the standard Stack methods including: `peak(), pop(), push()` which function as described in the Stack ADT in your book. Suppose that I create a new Stack `s` using the following lines of code.

```
Stack s = new MysteryStackImp();
s.push("Schiller");
s.push("is");
s.push("Awesome);
```

Your job is to write some lines of code that will reverse the order of the items stored in `s`. Hint: You may want to create one or more new Stacks to complete this task.

4 Submission and Grading

You'll submit a single PDF to Moodle. Please name your PDF `[your_last_name]_HW7.pdf`. So for example, I would submit the file`Oesper_HW7.pdf`.

This assignment is worth 8 points. Each question is worth 2 points and your responses will be graded on both correctness and clarity. You may also not receive full credit if you do not submit a PDF.

Start early, ask lots of questions, and have fun! Layla, the lab assistants, and the prefect are all here to help you succeed - don't hesitate to ask for help if you're struggling!