

CSC 2720 Data Structures

Homework assignment 4

Instructions: Please complete the following questions on a separate sheet of paper. After you have finished, scan your work and upload it to **Homework Assignment 4** in our **Gradescope** for the **CSC 2720 DATA STRUCTURES XLS Group ACS11 Spring Semester 2025** course.

1. An airport is developing a computer simulation of air-traffic control that handles events such as landings and takeoffs. Each event has a *time stamp* that denotes the time when the event will occur. The simulation program needs to efficiently perform the following two fundamental operations:
 - a. Insert an event with a given time stamp (that is, add a future event).
 - b. Extract the event with smallest time stamp (that is, determine the next event to process).

Which data structure should be used for the above operations? Why?

2. Bill claims that a preorder traversal of a heap will list its keys in nondecreasing order. Draw an example of a heap that proves him wrong.
3. Hillary claims that a postorder traversal of a heap will list its keys in nonincreasing order. Draw an example of a heap that proves her wrong.

Due Date: April 13, 2025