CISC 3115 EWQ6

Exercises for Stack and Queue

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Exercises

- Infix expression evaluation
- Compute directory size (including subdirectory) without using recursion
- Passenger seat assignment using a priority queue (1st class and economy class)

Infix Evaluation

- Complete the example program in section 20.11 in the textbook
  - Create a directory for this exercise
  - Enter, compile, and run the programs in Section 20.11 (Listing 20.12)
  - Revise the program to add an operator “^”, i.e., the power operator, e.g., 2^3 = 2 * 2 * 2 = 8. Note that the power operator has higher precedence than * and /

Directory Size

- This is exercise 20.18 in the textbook, i.e., to write a program to compute total size in bytes of a directory including all files and subdirectories.
  - Solution 1. Use recursion.
  - Solution 2. Redesign the program using iteration instead, for which, we use a Queue data structure. The algorithm is given in exercise 20.18
- Create a directory for each solution

Passenger Seat Assignment

- This is to extend the example program discussed in class. We assign seat on an airplane for passengers in a queue. We now consider that passengers have priority, i.e., the 1st and economy classes.
  - Create a directory for this exercise
  - Randomly generate a number of passengers to form a queue, and randomly assign one of the two classes
  - Use PriorityQueue to assign seats, the passengers in the 1st class have higher priority
    - Assume the aircraft has only one cabin.
    - The passengers in the 1st class get to pick a seat first. You may simulate it by randomly assign a seat (no user interaction). You can list available seat and enter one from the list if you wish to.