Programming Fundamentals

Lab #8

Topics

- Queues
- Linked lists
- Trees

Concepts

Queue data structure
Linked list modification
Tree terminology
Tree traversal

Exercise 1

Modify the main method of the Driver class from Lab #7. In this method, do the following:

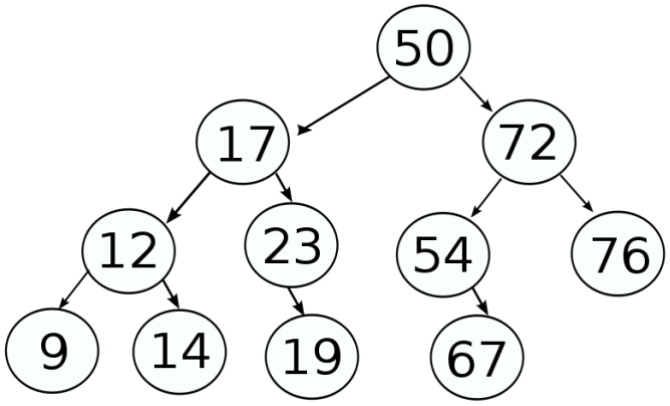
1. Create instances of an `ArrayQ` and a `LinkedQueue`
2. Enqueue the following `int`'s onto the two queues: `(1,7,3,4,9,2)`
3. Dequeue all the elements from the queues, displaying each `int` as it's removed

Exercise 2

Modify the `LinkedQueue` class to include a new method called `removeMiddle`, which removes from the queue the value that is in the middle.
For example, if the queue contains 3, 7, 2, 4, 5, then 2 will be removed.
If the queue contains 2, 9, 1, 4 (even number of values), then remove 9 (round down).
Test the method using the `Driver` program.

Exercise 3

Use the tree diagram below to answer the questions below.



a) What is the root node of the tree?

b) What are the leaf nodes of the tree?

c) What are the ancestor nodes of the node containing 19?

d) Write the sequence of node values that you would get from a post-order traversal.