Lab 7 Due 11:59pm, 11 April

The Two Towers

1 Short Answers

No short answers this week...

2 Lab Program

Do the laboratory at the end of Chapter 7. A few details:

- 1. Your first step is to implement a SubsetIterator class that extends AbstractIterator. Be sure to import structure.* and java.util.Iterator at the top of your file.
- 2. Your SubsetIterator should be completely generic. It should know nothing about the values of the Objects in the Vector.
- 3. For testing, write a main method of your SubsetIterator that creates a Vector with the Integers from 0 through 7, creates a SubsetIterator with this Vector, and then prints out all subsets returned and a count of the subsets returned. Make sure you end up with 256 subsets printed.
- 4. Write the main method to solve the two-towers problem in a separate class called TwoTowers, proceeding as specified at the top of p. 165.

2.1 Deliverables

When you are finished, create and submit a tar file lab7.tar that includes the following:

- 1. Your well-documented and nicely-formatted source code. Include pre- and post-conditions, as appropriate. Also use Assertions to enforce your preconditions. Be sure to name your files Sub-setIterator.java and TwoTowers.java.
- 2. A README file that includes your answers to the two thought questions in the text.

Also in the README file, answer these extra questions (let's call them thought question 3): How long does it take your program to find the answer to the 20-block problem? Rather than instrumenting your source code with a timer, try instead the Unix time command, as in the following:

time java TwoTowers

Based on the time taken to solve the 20-block problem, about how long do you expect it would take to solve the 21-block problem? What is the actual time? How about the 25-block problem? Do these agree with your expectations, given the time complexity of the problem? What about the 40- and 60-block problems? (You can try these if you're very patient, but for the purposes of this question, just estimate based on the run times of the smaller problems).

To create a tar file, use the "tar" command to archive the full contents of a directory into a single file. For example, the command tar -cf lab7.tar lab7dir creates a file called lab7.tar containing the full contents of the directory lab7dir. You can then run turnin -c 136 lab7.tar to submit the tar file.