CS284 Final Project

Time Travelling Wookiees on the Oregon Trail

Synopsis

The Doctor travelled to Kashyyyk to visit the great Attichitcuk, Chief of the Kaapauku, as he became a father. While the Doctor saw baby Chewbacca, the smart Wookiees of Kashyyyk snuck in the TARDIS (Time and Relative Dimension in Space) and copied the design to build their own time travel machines. Unfortunately Wookiees are not Time Lords from Gallifrey, and while being great engineers, they were not perfect. Their designs are far from perfect and tend to work fairly erratically.

Your goal is to simulate what will happen to the adventuring time-travelling Wookiees as they test out their defective time machines. There are more Wookiees willing to travel than machines ready for use, so they decide to use the machines based on their age and rank in the clan (see below). Each time machine will support 2 Wookiees at a time (as you should always have a companion when travelling through time and space). Each Wookiee will attempt to go forward in time to the Oregon Trail, at different locations, unfortunately, the instability of the machines may send them somewhere else. Based on their ending location, calculate the outcome of each travel.

Operation

To start the program run "java TTWOTOT filename.dat" where "filename.dat" is a text file with input data (see below). Then display a full text menu with the following options.

1) Show Wookiees
2) Show Time Machines
3) Show Locations
4) Add Wookiee
5) Add Time Machine
6) Add Location
7) Load New File
8) Run simulation
0) Exit

Methods

1) **Show Wookiees**
   Will display the set of Wookiees ready to attempt time travelling, along with their age, rank, engineering skill & fortitude
2) **Show Time Machines**
   Will display the set of time machines in the system, along with their quality level

3) **Show Locations**
   Will display the set of known locations in time & space, along with the events that tend to happen in those locations.
4) **Add Wookiee**
   Will ask the user to input a name, age, rank, engineering skill & fortitude for a new wookiee that will be added to the set of Wookiees
5) **Add Time Machine**
   Will ask the user for a name and instability level and add the machine to the set of machines
6) **Add Location**
   Will ask the user for a location name, an event that could happen there, a category of event (see below), and the rating for the event (see below)
7) **Load New File**
   Prompt the user for an input file name formatted like the original one and load the new data in the program.
8) **Run the simulation**
   See below. This will print the simulation results

Input File Format

The input file will contain a line with the number of Wookiees, locations, and machines to create. Let's call those W, L and M. Next you will have W lines formatted as "Name age rank engineering fortitude". Age is an integer from 1 to 500, rank, engineering and fortitude are integers from 0 to 5. After the W lines, you will have L lines with cities formatted as "Name with spaces|event that may happen|category rating". Where Name and Event are strings, category is a single letter (e: engineering, f: fortitude, w: wisdom, i: intelligence), and rank is a number from 0 to 500. Finally there will be M lines formatted as "name of machine|instability", where quality is a number from 0 to 10 (0 meaning highest quality).
e.g. Your file could look like this:

```
2 1 3
Bewchabbacc 245 4 5 4
Attichitcuk 350 5 4 3
Willamette Valley, Oregon|Party time!|i 0
TARDIS|0
Excellent Phone Booth|4
DMC DeLorean|3
```

The Simulation

The Wookiees should be organized by their combined rank and age, where their total hierarchy is equal to [age + rank *100] (you may want to use a sorted array of Wookiees for this). Each location will be placed in the order it was given on the file, where the first location is the best place to travel (and where everyone wants to go) (probably a Hash Table). Every time machine should be placed in a data structure allowing Wookiees to pick the highest quality machine. Remember

that higher quality is a lower instability (you already implemented a priority queue, might as well use it!).

Once the simulation starts, the top wookiee available will pick the lowest ranked wookiee available as his companion/apprentice. Then they will jump on the best available time machine and attempt to travel to the location at position 0. Since time machines are not perfect, the actual location they end up in will be determined by the formula: [(20*instability/(sum of passengers' rank))%L]. If a time machine already travelled to that location, place it in the next available city.

Calculate where every pair of wookiees will travel to until there are not enough wookiees to create new pairs, no more time machines, or no more available locations. Once the time travelling is done, figure out the outcomes of each travel.

Events assigned to each location will happen to each wookiee travelling there based on the rating and category as follows:

Engineering Events: Affects both passengers if their combined engineering level is less than the event rating. E.g.: Engineering event "machine breaks" with rating 6 and two wookiees of levels 4 and 2. The machine will not break because they're good enough to fix it.

Fortitude Events: Affects each passenger separately if their fortitude level is less than the even rating. E.g. The fortitude event "Dysentery", with rating of 4 and two wookiees of fortitude 3 and 4, would affect the first wookiee but not the second.

Wisdom Events: Affects each passenger separately if their age is less than the rating. E.g.: The event "Gets hunted down by rednecks thinking he's Big Foot", with rating of 250 would happen to any wookiee 249 years old or younger. Older wookiees are wise enough to know how to hide better.

Intelligence Events: Affects both passengers if their combined rank is lower than the event rating. E.g.: The event "Time machines drowns in the river" with rating 8 and two wookiees of rank 3 and 4 would indeed happen.

Simply print what will happen to each wookiee in each different location.