CS 1316 – Homework 12 – Planning a Discrete Event Simulation

Due: Friday, April 30th, 2010 before 6pm   -   100 points

THIS IS AN INDIVIDUAL ASSIGNMENT!

You should work individually on this assignment. You may collaborate with other students in this class. Collaboration means talking through problems, assisting with debugging, explaining a concept, etc. You should not exchange code/text or write code/text for others. For individual assignments, each student must turn in a unique program or document. Your submission must not be substantially similar to another student's submission. Collaboration at a reasonable level will not result in substantially similar code/documents.

Planning a Discrete Event Simulation

In this assignment, you will plan an object-oriented simulation. You will turn in a document describing how you will build a discrete event simulation. Note that you will not actually be writing code. Instead, you will be documenting your agents, events, and resources. Your document must describe:

- What you are attempting to simulate.

- The agents your simulation will use.

- The events your agents will react to (and create).

- What resources your simulation has, and which agents will block when waiting for those resources.

Specifically, your simulation plan document must have at a minimum:

- Five different types of events. These events may be shared by one agent type, or spread across multiple agent types. You must describe how each event is scheduled, and what happens when that event occurs.

- You must explicitly describe what the "processEvent" method for each agent type will do.

- A minimum of one resource (upon which agents will block). You must describe what the resource will represent, which agent(s) consume the resource, and which agent(s) restore/produce the resource.

- A representative (sample) "run" of your simulation. You will "run" your simulation manually, and write down the "log file" that your simulation would create (if you implemented it). Note: you are free to actually code your simulation, and allow it to write the log file itself if you would like, but you are not required to write code for this assignment. Your log must show agents acting on all types of events, and your resource(s) blocking and unblocking agents.

Your team must select what to model with your simulation. If you want, you may design your own system to model. Below are a few suggestions if you have trouble thinking of your own:

- A bank simulation with customers, tellers, cash drawers, vaults, etc

- A fast food establishment with customers, cooks, and food queues.
- A classroom final exam with TA's, Students, exams, (and perhaps a limited number of pencils?)

Grading Breakdown:

- Resources & Events

    o   Events are fully described, including agent interactions   …10

    o   Resource(s) fully described, including consumers and producers   …10

- Agents

    o   Agents are fully defined and well chosen   …10

    o   processEvent method behavior for each agent is well defined   …20

- Document

    o   Well formatted, correct grammar and spelling   …15

    o   Fully documents the simulation with enough details to implement it   …15

    o   Log of simulation "run" is accurate and complete   …20