COIS 4470H Modelling and Simulation – Winter 2023

Project

Due: Friday, April 14th

For this project, you are required to develop simulation models for an appropriate system. You are responsible to select a system in an application area (computing, management, inventory, manufacturing**,** networking, service, organization, health center, military, logistics, transportation, **…**) that you are interested. Either a general-purpose language such as C, C++, C#, Java, Python, OR a special-purpose simulation languages can be used for your programs.

For comparison, you should consider two or three different configurations of the system and submit a written report for your study. The following sections should be included in your report:

1. Introduction, background
    - Purpose of the study, objectives, related work
2. System description
    - Simulation language selected
    - Conceptual model, diagrams, assumptions
    - Specification model, parameters, distributions
    - Key output measures, alternative configurations
3. Experiment and comparison
    - Results from the simulation runs
    - Comparison and discussion
    - Statistics analysis
4. Conclusions and recommendations
5. References

The report should be 5-10 pages including diagrams, tables, algorithms, and references. Upload both your report (Word or pdf are accepted) and the simulation programs to the Project Drop-in Box on BlackBoard.

Proceedings (https://www.informs-sim.org) from the Winter Simulation conference (https://meetings.informs.org/wordpress/wsc2021/history/), is a good source of references for simulation application and research. You are encouraged to come up with your own topics and develop your own models. It is also ok to replicate a simulation study reported in a research article.

Special-purpose simulation languages such as GPSS have the advantages of building models quickly with built-in features (e.g., queue structures), graphics and animation. The following are some languages identified using Google as SPLs supporting discrete-event simulation: Arena, AWESIM, PASION, PSIM, QUEST, SDX, Shift, SIMAN (SIMulation ANalysis), SIMSCRIPT II.5, SimEngine, SimLogic, SimNet II, SIMPLE++, SIMUL8, SLAM II, and SMPL. You can refer the following links for more selections:

https://en.wikipedia.org/wiki/List_of_discrete_event_simulation_software
https://en.wikipedia.org/wiki/List_of_computer_simulation_software