PURPOSE:

Single/Group assignment: Maximum limit of three people to a group

Select a problem area or system of interest where you can model this problem with the concepts, tools, and methodologies of stochastic processes. Identify the probability distributions and random variables of interest along with the system constraints and parameters and suggest how they can be represented through a mathematical model of the system. We are also interested in estimating the parameters of the model, analyzing the model, and synthesizing the results to possibly finding ways of improving the system. So we have the following steps:

Step 1.0: System Model Description
Step 2.0: Model Analysis
Step 3.0: Model Synthesis

Remember that this is a course where a collection or sequence of random variables is of paramount importance and we wish to characterize this collection or sequence of random variables, develop appropriate models of this process, and seek, if possible, optimal operating policies or solutions for improving this system. Computational solution of the model is also strongly encouraged such as is possible with MATLAB, Maple, or Mathematica. Demonstration of the project with App Inventor software is highly encouraged.

Your final typewritten project report (10 pages maximum) should include the following sections:

1. Introduction (Background) – a clear description of the system or problem under study and the purpose of your study. What are you attempting to accomplish and what key measures of effectiveness are to be used? What are the key random variables of the system?
2. Model analysis – What data were collected and how? What parameters were estimated? What analysis was performed? The raw data should be organized and tabulated in an appendix.
3. Model Synthesis – If possible, develop some optimal policies or good operating policies. Would they be optimal? Please try to use computers where possible to numerically estimate the solutions of your model.
4. Conclusions and recommendations – what conclusions can you make from your analysis? What do you recommend be done – to improve the system and/or for future work?

REQUIREMENTS:

As a first step in the project, I would like a one page typewritten description of the project proposed by February 16th, 2018. This proposal will be evaluated as part of your term project assignment. You will be evaluated based upon the following criteria:

- Creativity and originality of your problem and its formulation
- Thoroughness and completeness of your results;
- Correctness of your results;
- Communication, Clarity, and Quality of your overall presentation.

As a final aspect of the project, we may have a presentation to the class of the various term projects.