TEAM PROJECT #3

OM 516 STEM/CREATE

Fall 2022

Topic: Project Scheduling via PERT

Problem Description

A homebuilder has broken down the total work of building a single-family home into 34 tasks. The precedence relationships among those tasks are given. The company has collected actual task duration data from 95 (numbered 0, .., 94) recently completed projects. Team *k* is assigned past project *k* from the data.

Resources

- Data
  - In two ("Tasks.csv" and "PastDurations.csv") files
- A Python library ("PublicFunctions.py") including functions you may need for the project.
- Python
  - Install Anaconda (https://docs.anaconda.com/anaconda/install/)
  - Install Jupyter Notebook (https://jupyter.org/install)
- Power Point presentation template

Tasks

1. (50pts.) Using the probability distributions from all past projects, apply PERT on the (uncertain) project. Specifically:
   i. What is the expected project completion time?
   ii. What is the expected critical path?
   iii. What are the variance and standard deviation of the project completion time?
   iv. If you want 95% confidence in completing a project on time, what completion time would you quote?
   v. Draw a Gantt chart for the project assuming each non-critical task starts as early as possible.
2. (30pts.) Analyze the past project assigned to your team. Specifically:
   i. What is the actual project completion time?
   ii. What is the actual critical path? Which critical tasks are common with the expected critical path in part 1.ii, which are different?

iii. What is the probability of completing the uncertain project in this much time or less?

3. (20pts.) Discuss the variability of task durations and the project completion time. Do you observe a large or small amount of variability? If you were in charge of operations for this construction company, how would you tackle variability? What would you do to reduce variability?

Python proficiency is a sought-after skill is today's job market, and this project is based on it to provide you with a learning opportunity in a controlled environment. However, you're by no means required to use Python to complete this project. If you prefer to use any other software (such as MS Excel), or no software at all, to complete the above-listed tasks, you certainly can. We just won't be able to provide additional sample solution templates.

Deliverables

- Details of your work (i.e., Python notebook(s). If you used another software, files showing your work there. If you didn't use any software, then scanned images of your manual work.)
- Power Point presentation (which you may present to class during our discussion).
- TeamProject3 assignment on Blackboard where you can submit the two afore-mentioned files by the due date (11:59PM on 11/29/2022).
- Discussion in class (on 11/30/2022).