Coding the Program Evaluation and Review Technique (PERT)

CS 315 Final Project (Draft)

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Abstract:

The Program Evaluation and Review Technique, abbreviated PERT, is a technique commonly used in project management in order to determine different time constraints on a project by looking at individual steps, or activities, that must be completed to complete a project. These activities can be classified as predecessor and/or successor events, where different activities can only be started once other activities have been completed. Each activity also has a variety information. One type of information is the time it might take to complete a certain activity, this duration then has four subcategories: pessimistic, optimistic, most likely, and expected time. In a diagram, an activity may also have descriptors that relay what the earliest and latest start and finish times are of that activity, and how much slack is available for each activity. Using PERT, one can find an order of activities from start to finish that would need the least amount of time to complete, one can also see the critical path of the project and find out how long it would take when traversing it.

The goal of the program is to allow for a user to easily find the most optimal (time efficient) path to take on a project. The program will consider best and worst-case scenarios and will receive user input to allow for the user to customize the output to better fit his or her needs.

This program will take an input of a list of activities, and after receiving some information about the activity, the program will be able to analyze the different paths of the project. The program will then output the paths, and their information, that would take the shortest amount of time and the longest amount of time (also referred to as the critical path). Since the activities in the project will form a Directed Acyclic Graph, topological sorting can be used in order to determine specific values needed by the user.

Materials/References:

Visual Studio Code will be used to code in C++

<https://en.wikipedia.org/wiki/Program_evaluation_and_review_technique>

<https://ascelibrary-org.ezproxy.uky.edu/doi/10.1061/%28ASCE%29CO.1943-7862.0001358>

<https://babel.hathitrust.org/cgi/pt?id=mdp.39015016222955&view=1up&seq=1>