**Project Management**

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1. Problem Setup
2. I set up estimated days to finish the tasks and the resources needed as below. For expected hours, I use best case hours \* 1.2; for worst case hours, I use best case hours \*1.5. The set up of manpower resource.

テーブル

自動的に生成された説明

1. Model Specification and Programming
   1. For this case, I choose Pulp to solve it as I am more familiar with its package.
   2. As I am not very sure how to convert Pert management to code, I asked Claude to provide Pert formula.
   3. Once perk duration is suggested, I use the duration to work on the minimum time needed for the project.

テキスト

自動的に生成された説明

1. Solution
   1. The solution of programming is as below. It suggests the total time needed is 185 days, from a the perspective of developing a software, this number looks reasonable.

テーブル

自動的に生成された説明

1. Overview
   1. In initial code, I have resources constraint added in the code. However, after few times trouble shooting and error, the programming keep showing the resource cannot be found with a feasible solution. Therefore, I deleted the resource code. I assume the minimum for resources is too less for programming to run. The cost for this set up will cost the salary for 1 project manager, 2 frontend developers, 2 backend developers, 2 data scientists and 1 data engineer. As the complexity of the software is not feasible, therefore, I set up this arrangement according to the tasks. If the function or features are more, then the set up might change accordingly.
   2. Beside from Pert, Monte Carlo simulation might be helpful if there are more information such as the urgency of the project or the resource constraint could be provided. From the information as of now, the skill of engineers and the complexity of requirements are the most uncertain factors to simulate the project plan.