

## **Allocation of Revision Time before Examination by Mathematical Modelling**

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### **Short Summary**

In this paper, we develop a model to help us to determine how much revision time we should spent on each subject before examination.

Once we define the variables and constants in the model, we work out some results from the model by considering the cases of one subject and two subjects. We also consider the cases under different weights of the subjects. We make use of the solver function in Excel to find out the optimal solution in each case. In the case of two subjects, we try to improve our model by using historical data to determine the constants used in the model by using the solver function in Excel again. The model can be applied to more than two subjects and any different combinations of weights of the subjects.

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## 1. Introduction

When we are preparing for the examination, we may have a question in our mind: How should the revision time be allocated to different subjects before the Examination? Since we have limited time to do our revision, if we spend too much time on one subject, it may lead to insufficient time to revise other subjects. We may think about the levels of difficulty of different subjects. We may spend less time on some subjects that are easier and put those time to the harder subjects. Also the weights of some subjects are higher and those subjects are relatively more “important” (especially core subject including Chinese, English and Mathematics). We may want to spend more time to revise those subjects. Therefore, there are quite a lot of considerations.

In this project, we are trying to build a model to investigate the best way of allocating limited revision time to different subjects.

## 2. Define Constants and Variables

In this model, we have many variables that need to be considered, such as the amount of revision time spent on each subject, the weight and level of difficulty of different subjects are also important variables. Moreover, the final mark of the examination is a dependent variable that depends on other variables, especially the revision time we spent on that each subject.

There are a lot of things that need to be defined in this model.

■ First, suppose there are  $n$  subjects (namely  $S_1, S_2, S_3, \dots, S_n$ ) in the examination.

■ Let  $w_i$  be the weight of subject  $S_i$  and we have

$$w_1 + w_2 + \dots + w_n = 1.$$

■ Let  $t_i$  be the amount of revision time spent on subject  $S_i$  and, for simplicity, we set  $t_i$  as non-negative integers.

■ Let  $T$  be the total available revision time to be allocated. Hence, we have

$$t_1 + t_2 + \dots + t_n \leq T.$$

■ Let  $m_i$  be the score of the subject  $S_i$  and we have

$$0 \leq m_i \leq 100.$$

■ Let  $M$  be the weighted score. Hence, we have

$$M = w_1m_1 + w_2m_2 + \dots + w_nm_n$$

## **6. Conclusion**

In this paper, we have explained how we develop the model to determine how to allocate the revision time to different subjects. We then obtain some results from the model. We consider the cases of one subject and two subjects. The model can be applied to more than two subjects.

This project helps us to think seriously about how much revision time we should spent on different subjects so that we can have the best result of the final average score in the examination.

During our work, we faced a lot of difficulties. There are a lot more factors that should be considered. All of these factors can influence and may have a huge impact on the result, for example, factors including the difficulties of the subjects, the difficulties of the examination papers, the scope of the examination, the schedule of the revision timetable, etc.

We hope in the future we can improve our model by including more factors and have better results.

**END OF THIS PAPER**