IT2023 ASSIGNMENT 01 (Due Date: Sept 22, 2023)

Instructions: You only have to answer Question 1. Your answers can be in either Chinese or English. The following points should be noted.

- If you use a word processing software to edit your answer, please make sure that the file to be submitted is either in WORD or PDF format.

- You need to submit the answer file before the due date to the Gmail account `johnsum.nchu@gmail.com`.

- Email heading must be conformed to `IT2023_Assignment01_studentID`.

- File name must be conformed to `IT2023_Assignment01_studentID`.

- It is a bonus assignment. If you are too busy to complete the assignment, you can just skip it.

The assessment of this course is solely depended on your work in the course project including your written report and your oral presentation. The scores obtained from the assignments are bounce which are added up on your project score.

Question 1

(a) You are given a set of 9 balls. All of them look the same and sensed the same. Eight of them weight 2000 grams and one of them weights 1999 grams. Pan balance is the only tool for use. Describe in detail, step by step, how do you use the pan balance to find the lighter ball.

(b) You are given a set of 9 balls. All of them look the same and sensed the same. Eight of them weight 2000 grams and one of them weights 2001 grams. Pan balance is the only tool for use. Describe in detail, step by step, how do you use the pan balance to find the heavier ball.

(c) Again, you are given a set of 9 balls which are looked and sensed the same. Eight of them are 2000 grams. However, we do not know if the abnormal ball is lighter or heavier. Describe in detail, step by step, how do you use the pan balance to find the abnormal ball.

Question 2

Now, the pan balance is not free for use. Each time you use the pan balance to weight the balls, you will need to pay NTD100. Calculate the costs for your solutions for the problems specified in Question 1.

Question 3

Do you need any intelligent technology to help you solving the problems as specified in Question 1, Question 2 and Question 3? Please explain your answer with reason(s).

Question 4

Now, pan balance is not available for use. Only an electronic balance is available. Each time you use the electronic balance, you need to pay NTD100. Describe in detail, step by step, how do you use the electronic balance to solve the abnormal ball problems specified in Question 1 and Question 2. Besides, calculate the costs for your solutions.

Question 5

Similar to Question 1, you are given a set of 9 balls which are looked and sensed the same. Now, there are two abnormal balls and their weights are unknown. Describe in detail, step by step, how do you use the pan balance to find the abnormal balls.