

**CS112 LBA**  
**Yuhao Chen**  
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## Description

Thomas Nam is the owner of AST Cafe in Seoul, who started to run the cafe two years ago. Since Thomas has another job, Ast Cafe opens only on weekends from 7 am to 12 am. The rental fee for the estate is \$1000 per month, and the electricity fee is \$300 per month. Besides Thomas, only one part-time employee is working for AST, who is paid \$400 per month.

Thomas estimates that there are about 40 customers on average coming to the cafe every day when it opens. The current profit situation is that the amount of revenue matches the amount of expense, and Thomas does not earn or lose money by running the cafe.

## Problem

To improve the revenue of the cafe by redesigning the menu.

## Memo

To: Mr. Nam

From: Yuhao Chen

Subject: How to redesign the menu of AST Cafe

### 1. Adjust The Type of Drinks And Desserts<sup>1</sup>

There are many drinks and desserts listed on the menu. Some of them are popular, while some of them are not. We can collect the data of the daily sales of each drink and dessert for three months, to average out the fluctuations. By analyzing and comparing the data, we can grasp customers' preference on the popular drinks and desserts. The most popular ones will be marked on the menu as "recommended". For the less popular ones, more steps will be taken to help us understand why they are not preferred. People will be divided into two groups to receive the interview: people who bought the popular items and people who didn't. For

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<sup>1</sup> #breakitdown: I break the problem "how to redesign the menu" down into three sub-question: how to change the type, how to change the price, and how to conduct the discount activities. Then I explain the solutions to these questions individually.

the first group, they will be asked their purchase reasons, and their suggestions to promote the unpopular items. For the second group, they will be asked about their reasons for buying the unpopular ones, their taste, whether they'll buy them again and suggestions for promotions. From analyzing the responses, we will understand why the unpopular ones are dismissed, and solve the existing problems. For example, if it is because of the high price, we will decrease the price to the optimum level; if it is because of the bad taste, we can improve the taste by refining the recipe ourselves or learning from other cafes; if it is because this kind of food is not popular among local residents, we can delete it from the menu.<sup>2</sup>

Besides refining the menu, we should also consider adding seasonal items favored by customers, such as chestnut bubble tea, and observe customers' purchase rates.

## **2. Adjust The Price**

The price of the drinks and desserts should be optimized to maximize the total revenue. Generally speaking, price and sale units are inversely related. Since people buy items from a cafe not only for its function as food, but also for the right to work or communicate in the cafe, the relationship between prices and sales is more sophisticated for the goods sold in AST Cafe. We can use a drivetrain model to find the best prices for goods. The objective is to find the best price for each drink and dessert, which leads to highest revenues. The levers we can change are the prices of the items. The data to collect are the corresponding average sale volumes of each price. Finally, with the data, we can generate the model showing the relationship between price and sales. Practically, we will randomize the prices for drinks and desserts every day for six months. For example, if the current price of Espresso is \$3.5, we can take a random number in the range \$3 to \$5 as the daily price of Espresso. After collecting the prices and their corresponding sales, we can calculate the net profit using the

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<sup>2</sup> #decisionselection: I talk about the framework of how to decide whether or not to change the recipe or price of a certain item on the menu, and explain why it helps to increase the popularity.

formula  $\text{Profit} = (\text{Price} - \text{Cost}) * \text{Sales}$  for each price we set, thereby finding the highest value of profit and its corresponding price.

### **3. Conduct Effective Discount Activities**

Holding certain discount activities will stimulate customers' purchasing desire. Therefore, we can use randomized experimental studies to understand the treatment effect of conducting a discount activity on revenue. For example, in scenarios with fixed prices and absence of additional advertising activities, we can randomly choose ten days from the six months to give a certain discount to certain drinks or desserts. All other features like prices and promotion campaigns will be fixed except the discount. Then, we compare the average profits under discount activities with the average profits under a control situation. The difference of means will be the treatment effect. However, in the cases that prices change and special advertising activities happen, we need to match every object from the treatment group to its most similar counterpart from the control group. For instance, an object from the treatment group can be: a day having 80% discount and the price of Espresso is \$3.8, while there is no special advertising activity. Its closest object in the control group<sup>3</sup> will be: a day having 80% discount and the price of Espresso is \$3.9, while there is no special advertising activity. In this way, although the price changes, we can use matching to decrease the bias as much as possible. The treatment effect will be attained by calculating the difference of means. If the treatment effect is positive, which means we earn more by conducting discount activities, discount activities should happen more often. The effects of other interventions such as changing the percentage of discount can also be explored in the future.<sup>4</sup>

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<sup>3</sup> #controlgroups: I recognize the control and treatment groups in this experiment, and discuss how to find the treatment effect.

<sup>4</sup> #interventionalstudy: I describe how I will conduct the experimental study to understand the treatment effect of having discounting activities. I also give clear examples to explain my method.

## Summary

In order to improve the revenue of the cafe by redesigning the menu, we can think of three ways to promote: change the type and recipe of food to make the food more popular, adjust the price of the food, and conduct discount activities. To further specify these three ways, I come up multiple methods to collect data and analyze data. Finally, I elaborate how to solve the problems with the data and the knowledge we learn from CS112.

## Pictures



The photo of Thomas and me talking with each other



The appearance of AST Cafe

About Simple Thing

COFFEE		DRAFT BEER	
Espresso	에스프레소 3.5	Heineken	6.0
Americano	아메리카노 4.0	제이내켄/세일런드/5% / 330ml / PILSE LAGER	
Flat White	플랫 화이트 4.5	Edelweiss	
Café Latte	카페 라떼 4.5	에델바이스/오스트리아/5% / 330ml / WHEAT BEER	7.0
Cappuccino	카푸치노 4.5		
Vanilla Latte	바닐라 라떼 5.0		
Caramel Macchiato	카라멜 마키아토 5.0		
Café Mocha	카페 모카 5.0		
Kahlua Latte (Only Ice)	칼루아 라떼 6.0		
TEA & ADE		WINE	
Milk Tea	밀크티 5.0	Torre De Rejas Verdejo	glass/bottle 8.0/29.0
Cream Chocolate	크림 초콜렛 5.0	토레 드 레야스, 레소베르(white)	
Yuja Tea	유자차 6.0	수제당 / 12% / 750ml	
Quince Tea	애플차 6.0	Casa Del Bouque Reserva Chardonnay	8.0/50.0
Plum Tea	매실차 6.0	카사 델 부크 레소베르 샤르도네(white)	
Yuja Ade	유자데이드 6.5	필라 / 14% / 750ml	
Quince Ade	애플데이드 6.5	J. Ruemer Rhein Riesling	60.0
Plum Ade	매실데이드 6.5	조지아의 리얼링 리저브(white)	
Grapefruit Ade	자몽데이드 6.5	독일 / 8% / 750ml	
Green Grape Ade	청포도데이드 6.5	Torre De Rejas Crianza	6.0/29.0
Kusul Tea	कुसुम차 7.0	토레 드 레야스, 크리안자(white)	
(Jasmine Green)	(자스민 그린티)	수제당 / 13.5% / 750ml	
(Ginger Lemon)	(진지 레몬차)	La Pazulina Syrah	7.0/49.0
Marlape Fresas	마리페라 초콜렛 7.0	라 파줄리나 시라	
(Marco Polo)	(마르코 폴로)	수제당 / 13.5% / 750ml	
(Vanilla)		Blackbeet Gewachse Syrah	7.5/49.0
		블랙비트 (2015년)	
		수제당 / 13% / 750ml	
		Alada Pinot Noir	8.0/50.0
		알라드 핀, 노르 (2014년)	
		필라 / 14.5% / 750ml	

The menu of AST Cafe

## **Interview Questions**

1. Why do you run a cafe?
2. Why do you open the cafe just on weekends?
3. How do you learn to make drinks and desserts?
4. Do you earn money from running the cafe?
5. How much is the rental/electricity/salary fee?
6. How many customers come every day on average?
7. What's your problem about your cafe that you want to solve?
8. What kind of attempt have you tried to solve the problem?
9. Are the solutions effective?
10. Do you have ideas to improve the profit?