

## BAX 442 Homework 1

Team F: Richard Liu, Charles Wang, Qinyi Qiu, Yuxin Yi, Jie Zhu

### 1. The narrative on what is conjoint analysis, how it works, and its benefits.

Conjoint analysis is a statistical technique that helps to determine how people value different attributes of a single product or service (the attribute's importance). It works to evaluate multiple product attributes, leads to the understanding of how people make purchase decisions based on their preferences of products and finds out the best combination of attributes to maximize their profit for the product.

#### How it works:

1. The first step of the conjoint analysis is to identify the important attributes. For example, in our case, the important attributes of a TV will be screen size, screen resolution, brand name, and price. By setting up these attributes, we can determine which one affects the purchasing decisions most.
2. The second step is to select attribute levels. In our study of designing flat-panel TVs, we are setting the attribute levels in screen size (55,65,75,85 inches), screen resolution (1080P, 4K, 8K), brand name (Sony, Sharp, etc), and price range (\$1500, \$2000, \$2500, etc)
3. The third step is to construct product profiles. In our situation, to implement our experiment, we have limited to 24 profiles by using 3 sizes\*2 resolution\*2 brands\*2 prices, instead of using the original level of profiles, since the original level of profiles will give us 144 profiles which are too high.
4. The fourth step we're collecting the personal preference ranking from different group members for all the attribute combinations which include screens of 75 inches and 85 inches, resolution 4K or not, Sony brand or not, and price low or high.
5. The fifth step after we collect all the preference rankings from the team, we apply a linear regression model to analyze each member's ranking and determine which attribute is more important for attracting different consumers to have the intention of purchasing a TV. In our step of the analysis, we use the OLS regression to analyze the dependent variable for the ranking, and the independent variables are the attributes and levels.

#### Benefits:

1. It benefits by helping companies to have a better understanding of customer preferences.
2. Understanding the product attributes can help companies with product development and pricing strategies, which allow them to maximize profit and market share.
3. This technique can allow companies to do market segmentation by identifying different segments in the market and different preferences by customers.

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4. It can better simulate real-world purchasing decisions, providing more realistic insight and information about the features.
5. The conjoint analysis also can be used for competitive analysis by comparing the different importance of attributes. The industry can understand their competitor's position and how to differentiate their products in the market.

### 2. Describe your findings in a table containing rows containing the first 6 outputs and each team member in column

#### 2.1. Partworths for each attribute level.

Your Name	Intercept	Screen_75	Screen_85	Resolution	Brand_sony	Price
Richard Liu	12.50	3.88	3.63	6.50	-1.50	-10.00
Charles Wang	20.91	-1.25	-4.00	-0.83	-0.50	-12.00
Yuxin Yi	7.04	1.75	3.88	12.00	1.17	-6.00
Qinyi Qiu	9.63	0.75	3.37	9.83	0.83	-6.00
Jie Zhu	15.21	-6.88	-5.00	7.25	2.42	-7.08

#### 2.2. Attribute Importance of each attribute

Your Name	Screen_Size	Screen_4k	Brand_sony	Price
Richard Liu	-1.69	44.07	-10.17	67.80
Charles Wang	-34.74	-10.53	-6.316	151.58
Yuxin Yi	9.98	56.36	5.48	28.18
Qinyi Qiu	14.89	55.80	-4.73	34.04
Jie Zhu	10.07	38.93	12.98	38.03

#### 2.3. Willingness to pay for each non-price attribute level

Your Name	Screen_Size	Screen_4k	Brand_sony
Richard Liu	181.25	325.00	-75.00
Charles Wang	-166.67	-34.72	-20.83
Yuxin Yi	322.92	1000.00	97.22
Qinyi Qiu	281.25	819.44	-69.44
Jie Zhu	-352.94	511.76	170.59

#### 2.4. Optimal price

Your Name	Optimal price
Richard Liu	2,100
Charles Wang	2,100
Yuxin Yi	2,200
Qinyi Qiu	2,200

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Jie Zhu	2,200
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### 2.5. Maximum profit

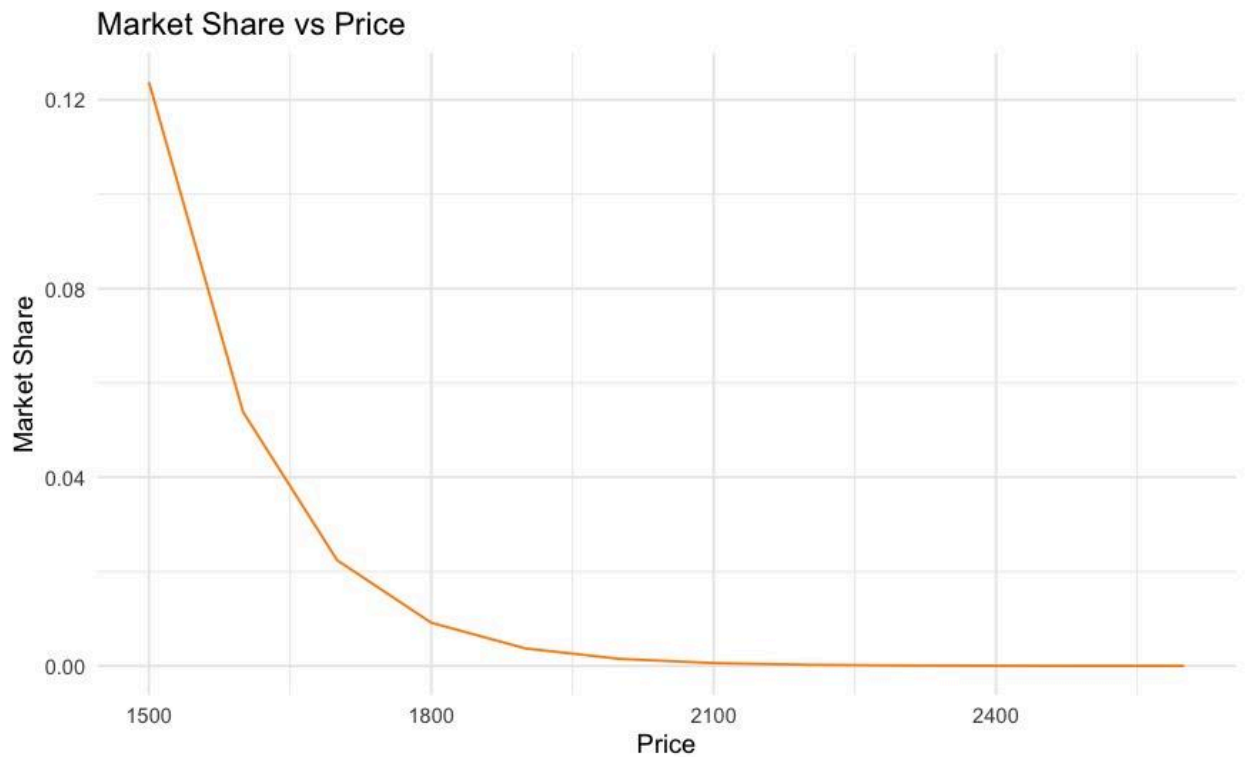
Your Name	Maximum profit
Richard Liu	6.0352
Charles Wang	4262.051
Yuxin Yi	0.04026808
Qinyi Qiu	0.359576
Jie Zhu	3.665571

### 2.6. Market share associated with optimal price

Your Name	Market share_my design
Richard Liu	0.00060352
Charles Wang	0.4262051
Yuxin Yi	2.013404e-06
Qinyi Qiu	1.79788e-05
Jie Zhu	0.0001832785

## 3. Plot market shares as a function of prices (output 7)

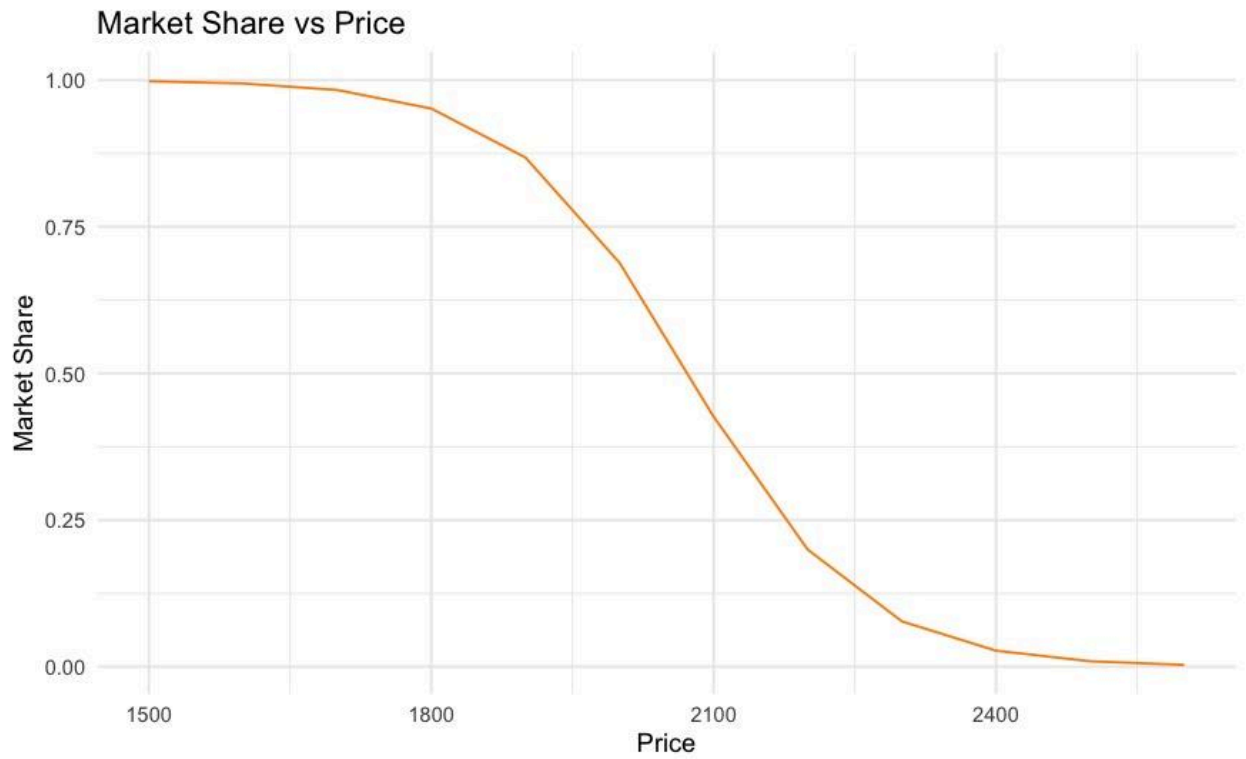
Richard Liu :



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Charles Wang:



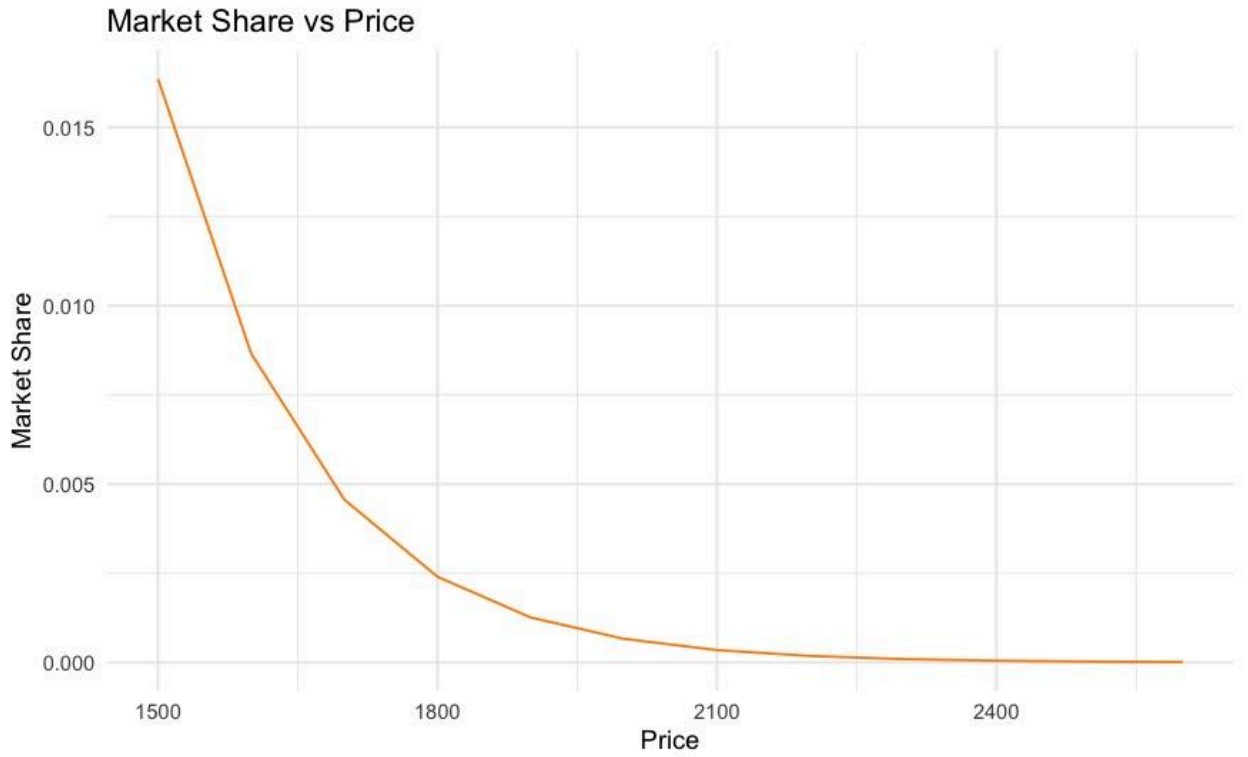
Qinyi Qiu:



Jie Zhu:

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Yuxin Yi:

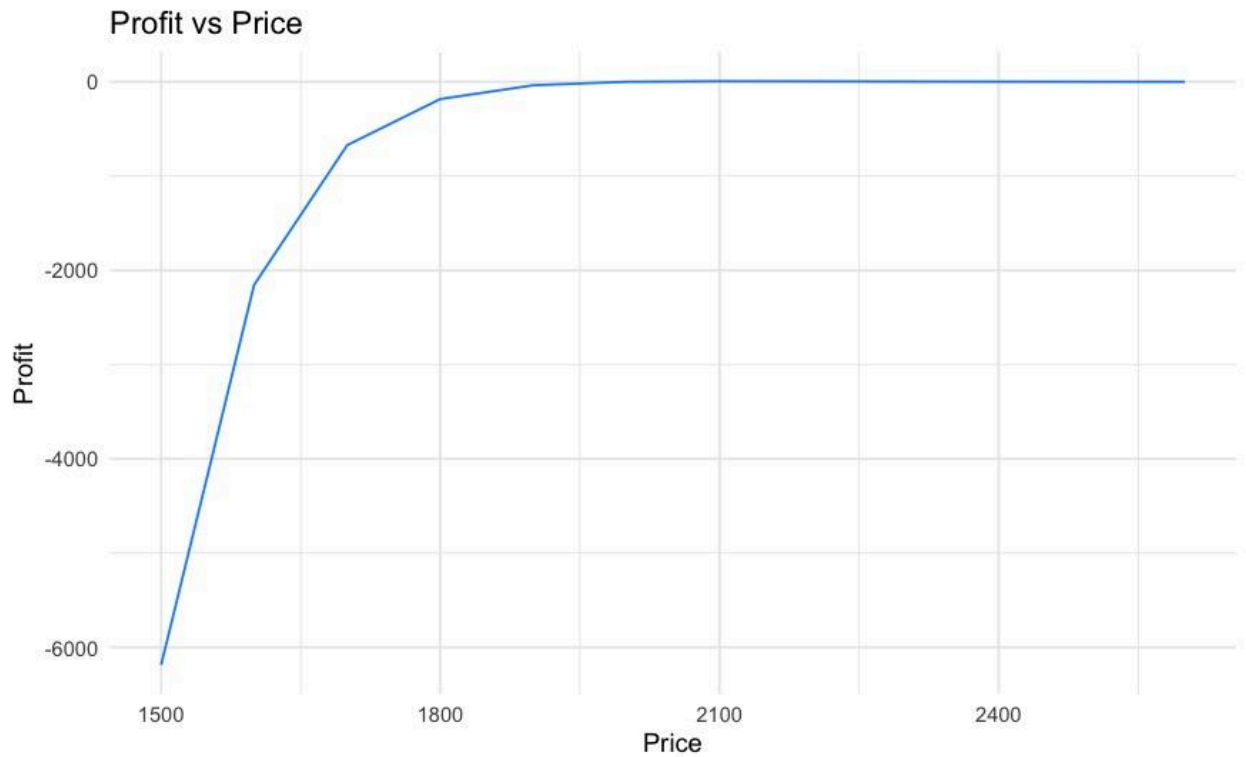


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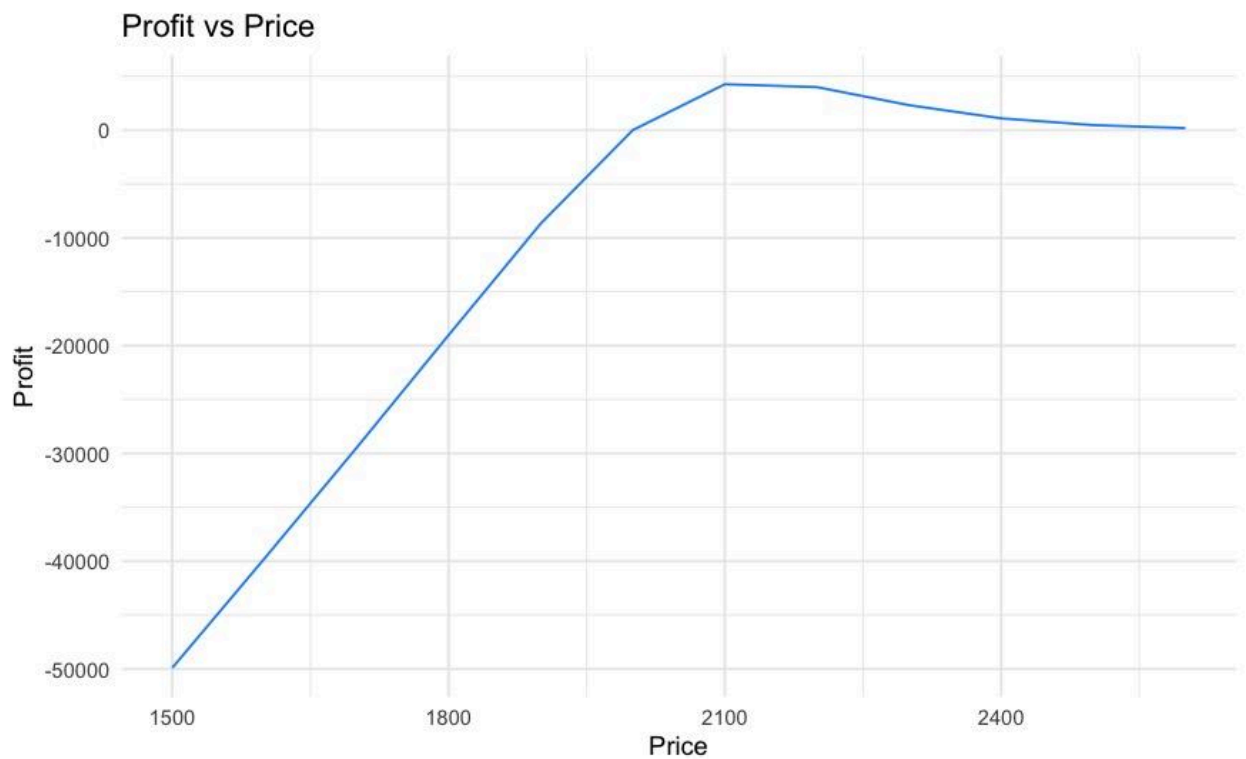
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### 4. Profit as a function of price for each team member (output 8)

Richard Liu :



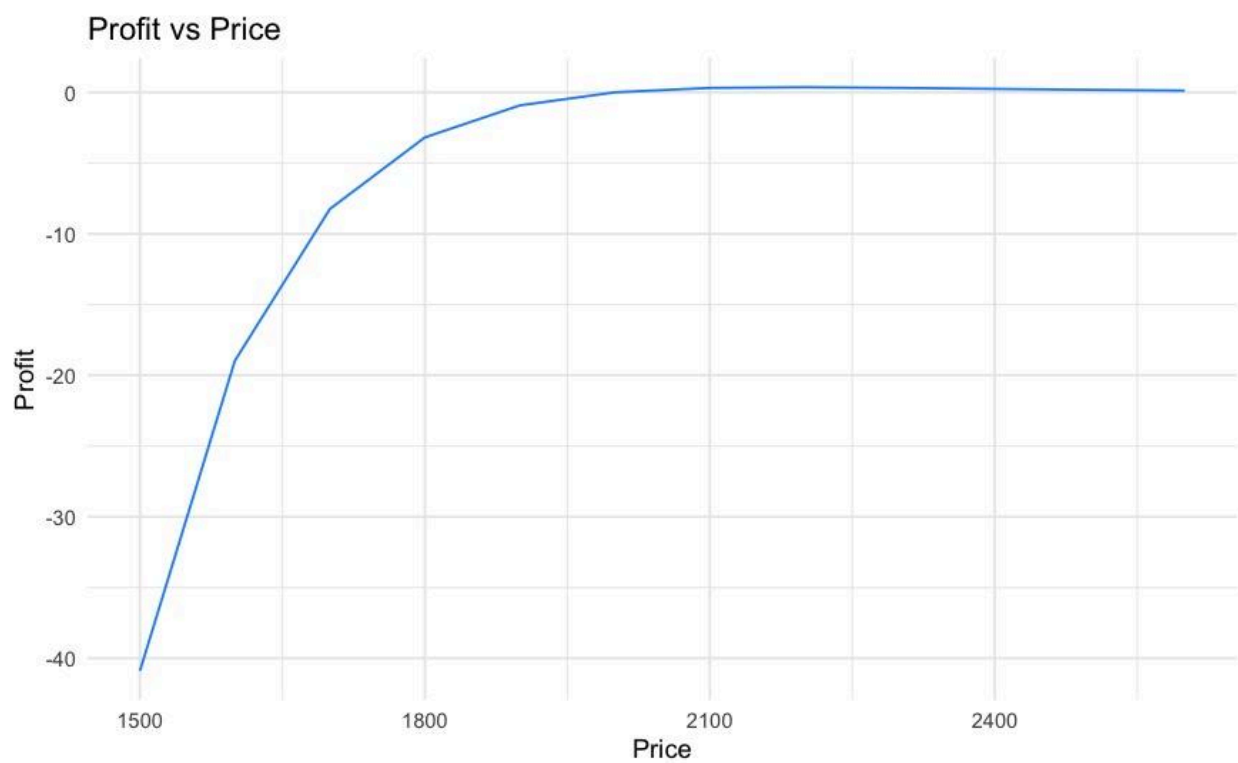
Charles Wang:



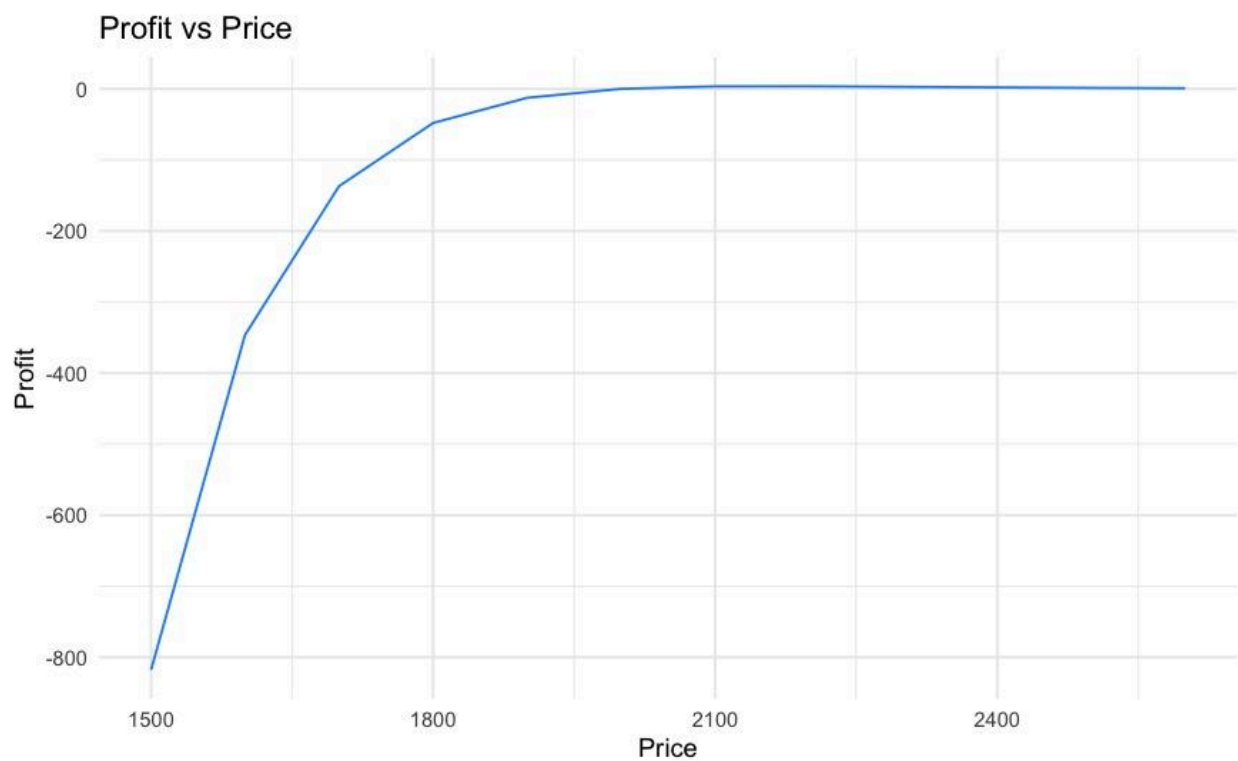
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Qinyi Qiu:



Jie Zhu:



Yuxin Yi:

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