Project: Analyzing a Market Test

Step 1: Plan Your Analysis

To perform the correct analysis, you will need to prepare a data set. (500 word limit)
Answer the following questions to help you plan out your analysis:
1. What is the performance metric you'll use to evaluate the results of your test?
   - ✓ The performance metric is the profit increase at least 18%.

2. What is the test period?
   - ✓ The test period is 12 weeks from 2016-April-29 to 2016-July-21

3. At what level (day, week, month, etc.) should the data be aggregated?
   - ✓ I will aggregate data to week period

Step 2: Clean Up Your Data

In this step, you should prepare the data for steps 3 and 4. You should aggregate the transaction data to the appropriate level and filter on the appropriate data ranges. You can assume that there is no missing, incomplete, duplicate, or dirty data. You're ready to move on to the next step when you have weekly transaction data for all stores.

How many transactions did you get for Store 10018 in the week starting 2015-02-06?

	Invoice Date	StoreID	Gross Margin	Weekly Foot Traffic	Trend	Seasonal	Sq_Ft	AvgMonthSales	Region	Group
7068	2015-02-06	10018	2212.7105	308	290.125	-0.078252	1183	18000	West	Control

Step 3: Match Treatment and Control Units

In this step, you should create the trend and seasonality variables, and use them along with you other control variable(s) to match two control units to each treatment unit. Note: Calculate the number of transactions per store per week to calculate trend and seasonality.

Apart from trend and seasonality...

1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.
   - ✓ Control variables to be used are Sq_Ft and AvgMonthSales

2. What is the correlation between your each potential control variable and your performance metric?
   - ✓ Control variable Sq_Ft has weak correlation with aggregated weekly store gross margin.
   - ✓ Control variable AvgMonthSales has strong correlation with aggregated weekly store gross margin.

	Gross Margin	Sq_Ft	AvgMonthSales
Gross Margin	1.00	-0.04	0.98
Sq_Ft	-0.04	1.00	-0.05
AvgMonthSales	0.98	-0.05	1.00

3. What control variables will you use to match treatment and control stores?
   - ✓ I will use AvgMonthSales due to its high correlated to performance as control variables.
   - ✓ I will also use Trend and Seasonal as control variables.
   - ✓ Total I will have three control variables named AvgMonthSales, Trend and Seasonal

4. Please fill out the table below with your treatment and control stores pairs:

	Treatment StoreID	Control StoreID
0	1664	7334
1	1664	8562
2	1675	2014
3	1675	1630
4	1696	7334
5	1696	8562
6	1700	7484
7	1700	1857
8	1712	8312
9	1712	7434
0	2288	8917
1	2288	12269
2	2293	12286
3	2293	9081
4	2301	12169
5	2301	12019
6	2322	9438
7	2322	2468
8	2341	9524
9	2341	9188

Step 4: Analysis and Writeup

Conduct your A/B analysis and create a short report outlining your results and recommendations. (250 words limit)

Answer these questions. Be sure to include visualizations from your analysis:

1. What is your recommendation - Should the company roll out the updated menu to all stores?
   ✓ I recommend the company to roll out the updated menu

Scatter Plot: % Change Treatment and Control Store
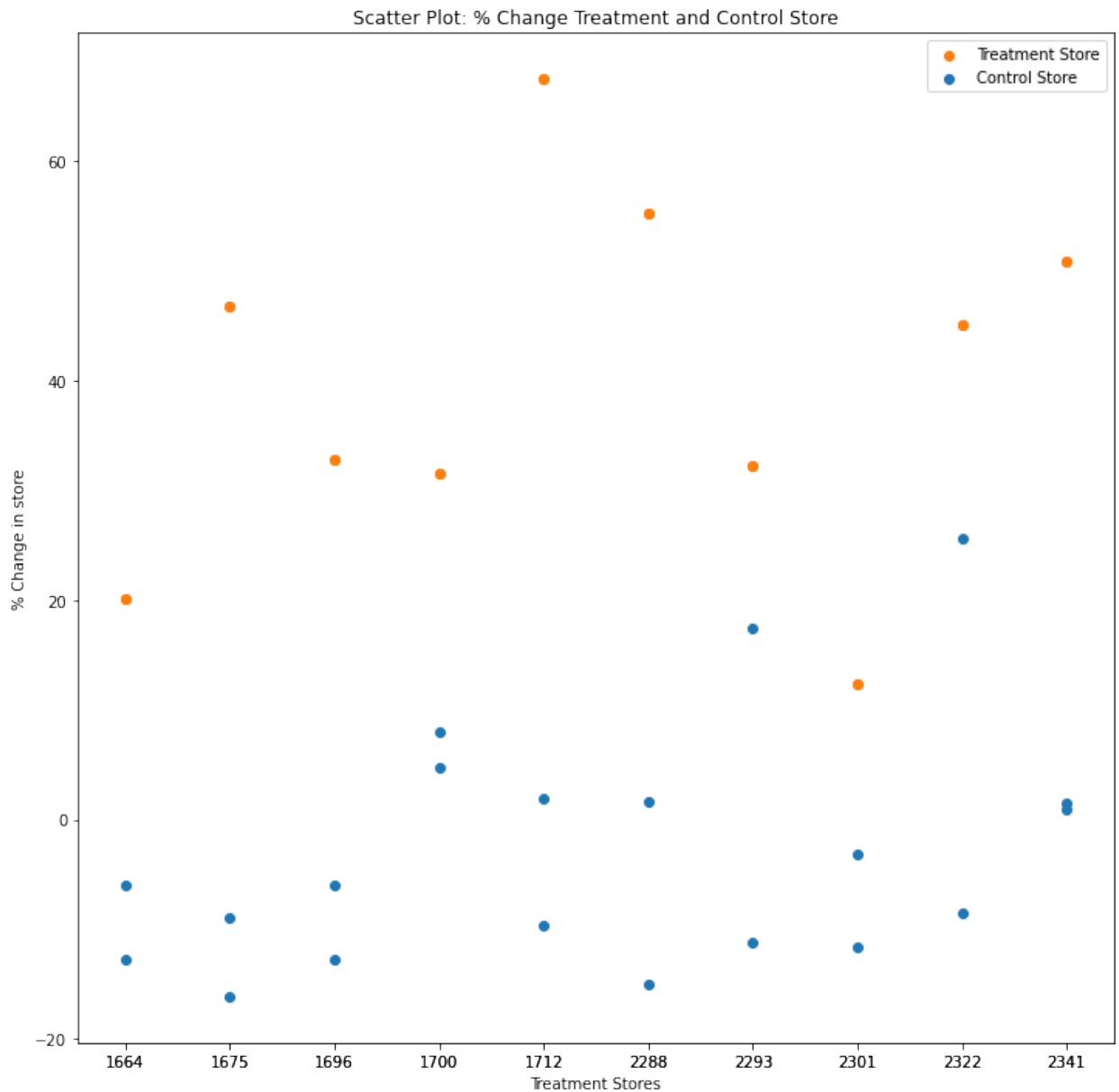
2. What is the lift from the new menu for West and Central regions (include statistical significance)?

```
West Region Test
Statistic: -4.284551362855903
P-Value: 0.00044612063836174627
Significance:  99.95538793616383
Lift: 39.980039187634375

Central Region Test
Statistic: -2.733830994627133
P-Value: 0.013634341572891347
Significance:  98.63656584271087
Lift: 42.10794010482854
```

3. What is the lift from the new menu overall?

```
Overall Test
Statistic: -3.820596876216018
P-Value: 0.0004790017920168904
Significance:  99.95209982079831
Overall Lift: 41.182573112176414
```