

GRPN Exercise

My 4Q13 Gross Billings Estimate by Segment (see Figure 1):

My Prediction	Q4 2013		
	Oct-13	Nov-13	Dec-13
Gross Billings (\$ million)			
Local	\$102.3	\$101.8	\$67.0
Goods	\$62.5	\$115.0	\$98.8
Travel	\$20.2	\$25.1	\$22.7
Total	\$185.0	\$241.9	\$188.5
Quarter Total	\$615.40		

Figure 1. My gross billings estimate by segment for 4Q13.

Short description of how I arrived at this estimate:

1. I resampled the raw data by day, took the total sales for each day across all segments, and visualized the data (see Figure 2)

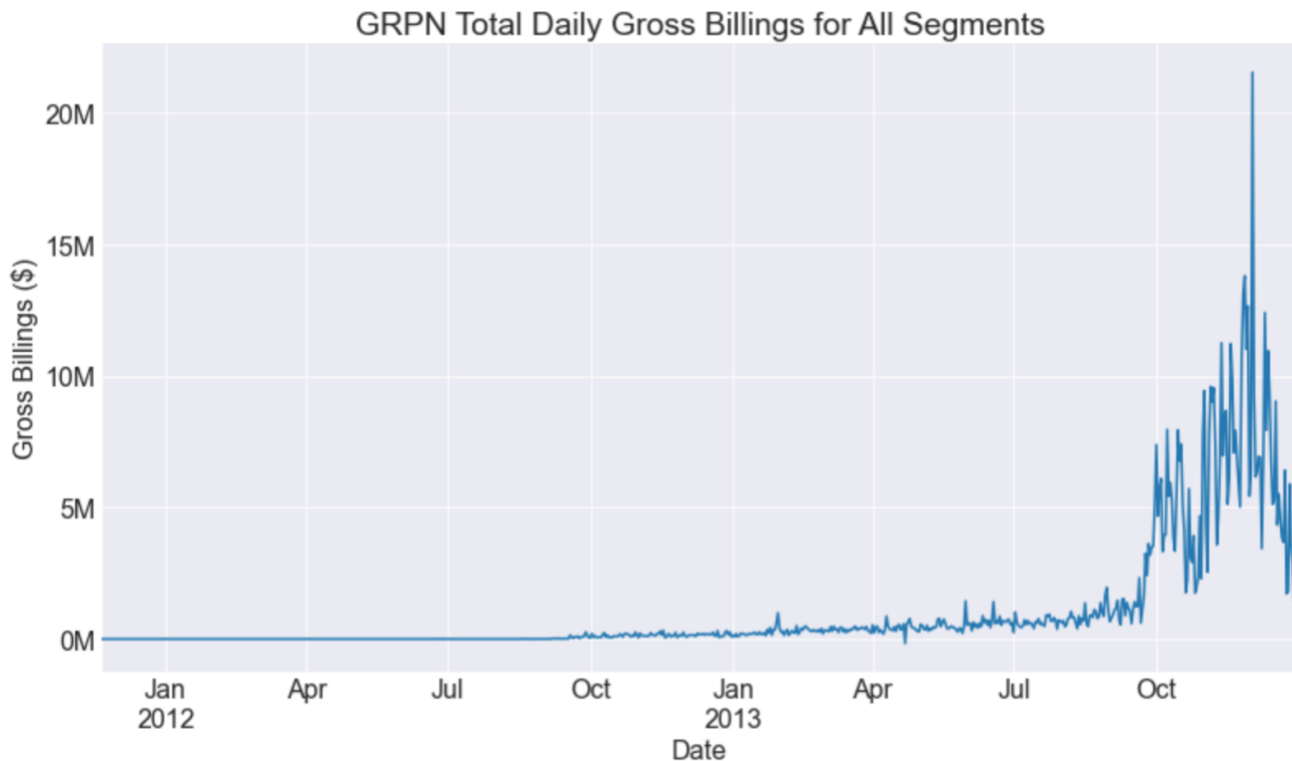


Figure 2. There appears to be some missing data in late October 2013, this will be investigated further below. Data before 4Q13 is sparse and doesn't appear useful for prediction of values for 4Q13.

2. I split the raw data into different tables for each segment (Local, Goods, Travel).
3. I visualized daily gross billings data for the Local segment (see Figure 3).

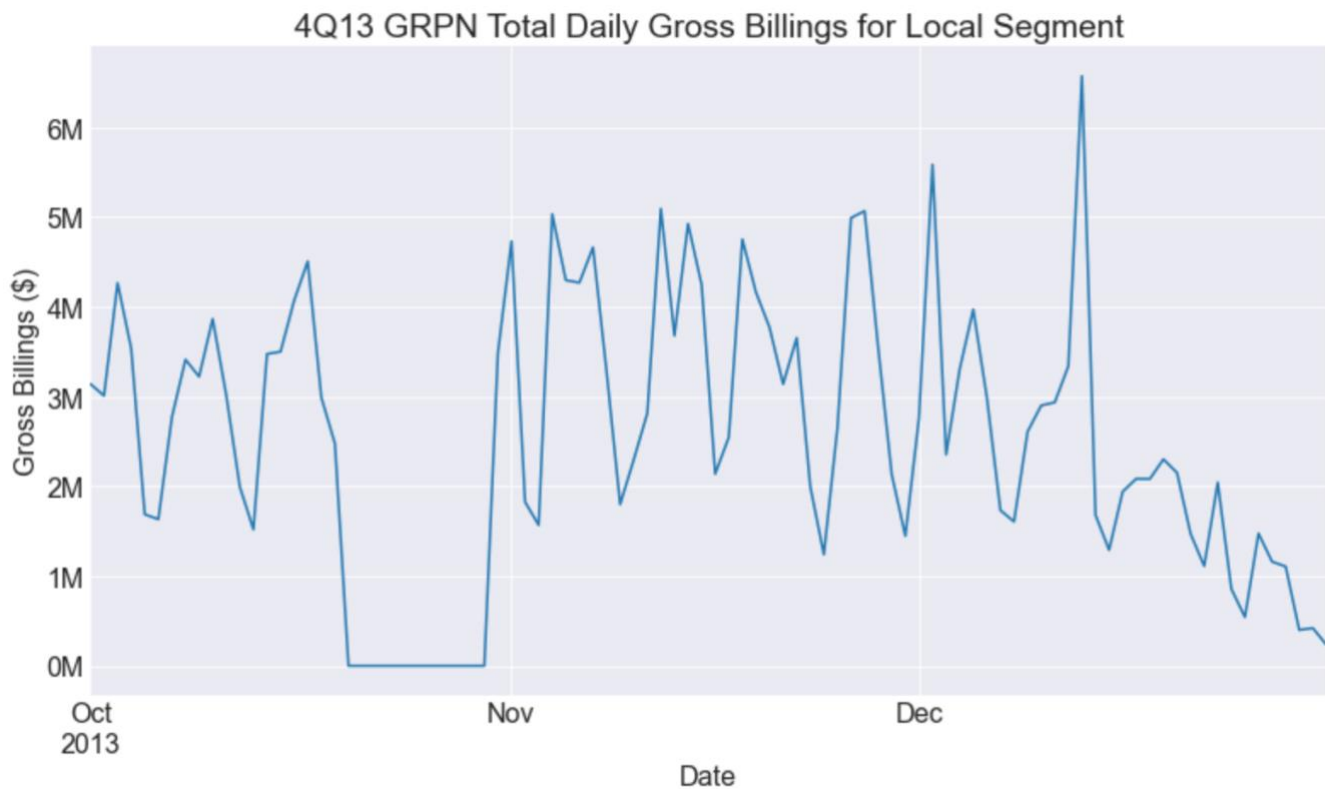


Figure 3. There is missing data from Oct 20th to Oct 30th for this segment.

4. I predicted the missing values using the trends noted in data.
 - a. I first found the average difference between the values for the week immediately preceding the missing values and the week before that week (2 weeks before the missing values).
 - i. I did this to capture the overall increasing trend in the data.
 - b. I then took the value for the day one week immediately preceding each missing value and added the average difference to these values to predict values for each missing day.
 - i. I did this to capture the weekly trend in the data.
 - c. I then visualized this imputed data (see Figure 4).

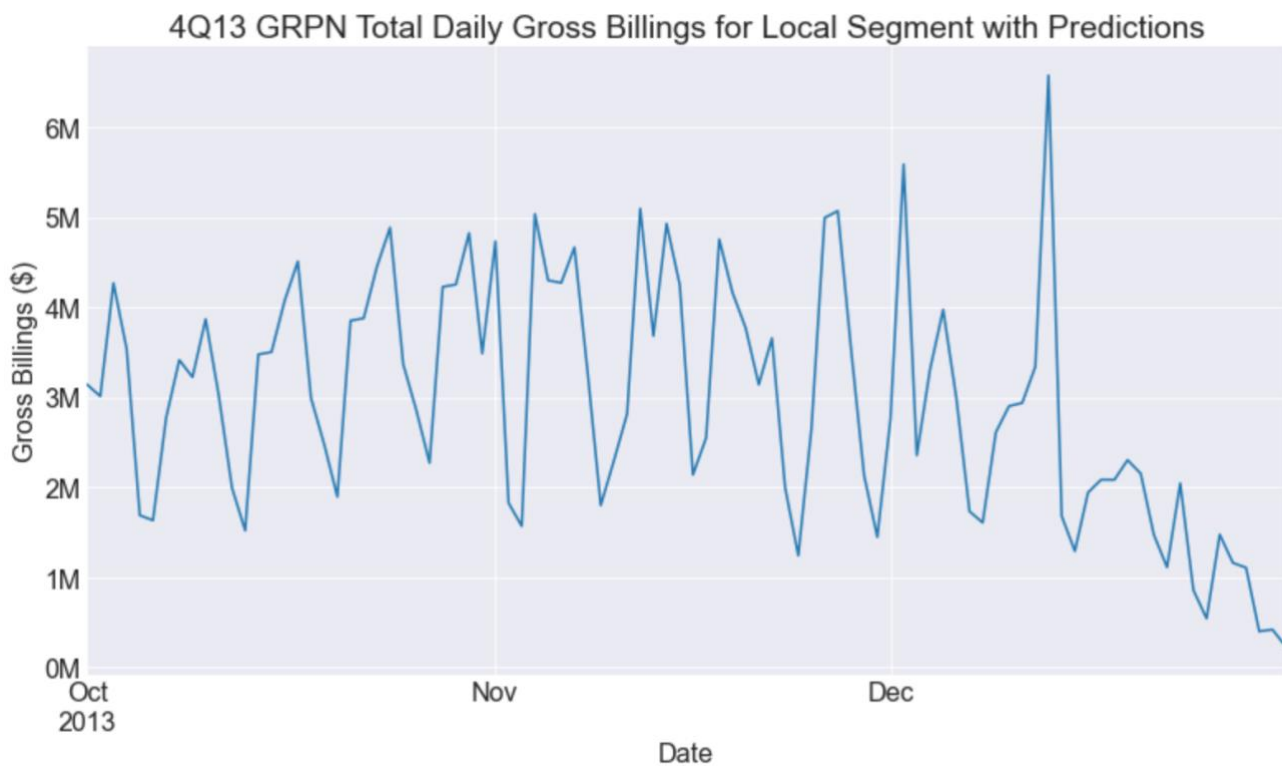


Figure 4. My predictions for the missing data seem to match the increasing trend and weekly trend.

5. I took the sum of gross billings in 4Q13 for the Local segment using the provided data and predictions.
 - a. \$271.1 M
6. I visualized daily gross billings data for the Goods segment (see Figure 5).

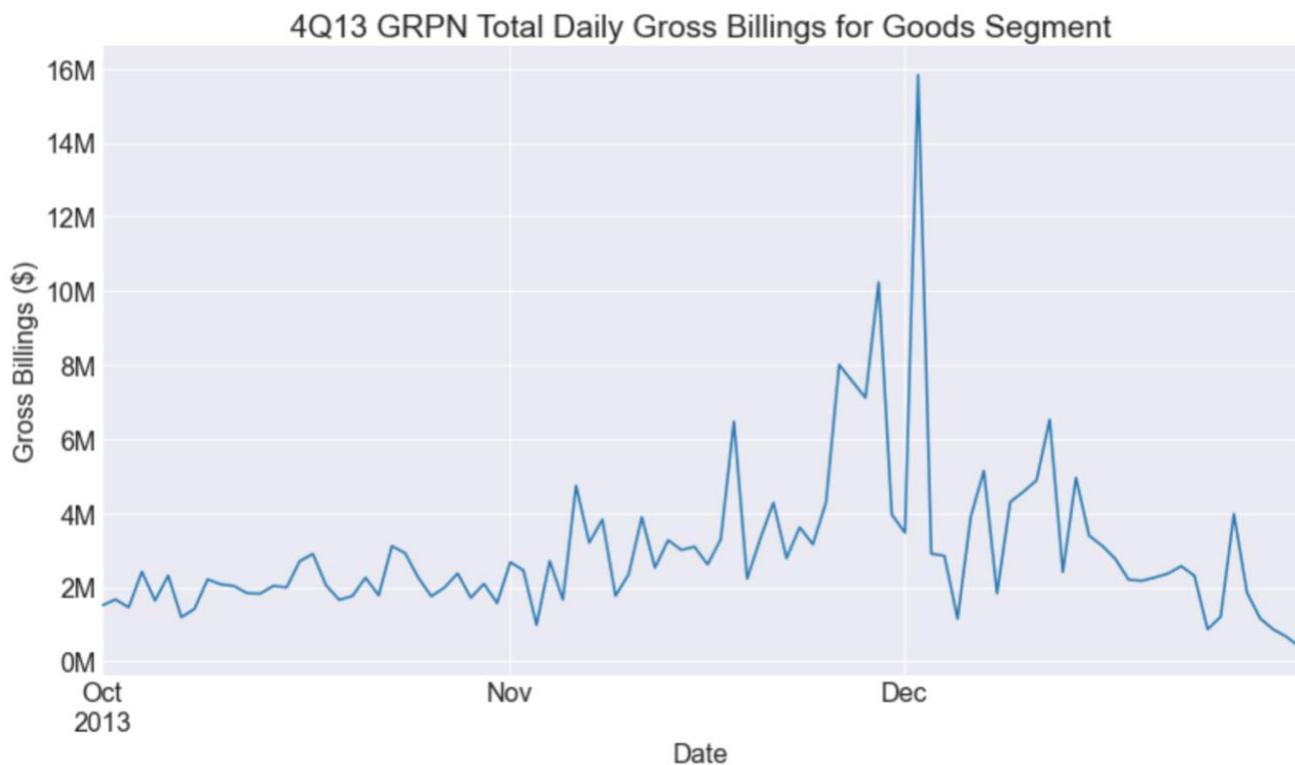


Figure 5. There doesn't appear to be any missing data for this segment.

7. I took the sum of gross billings in 4Q13 for the Goods segment using the provided data.
 - a. \$276.3 M
8. I visualized daily gross billings data for the Travel segment (see Figure 6).

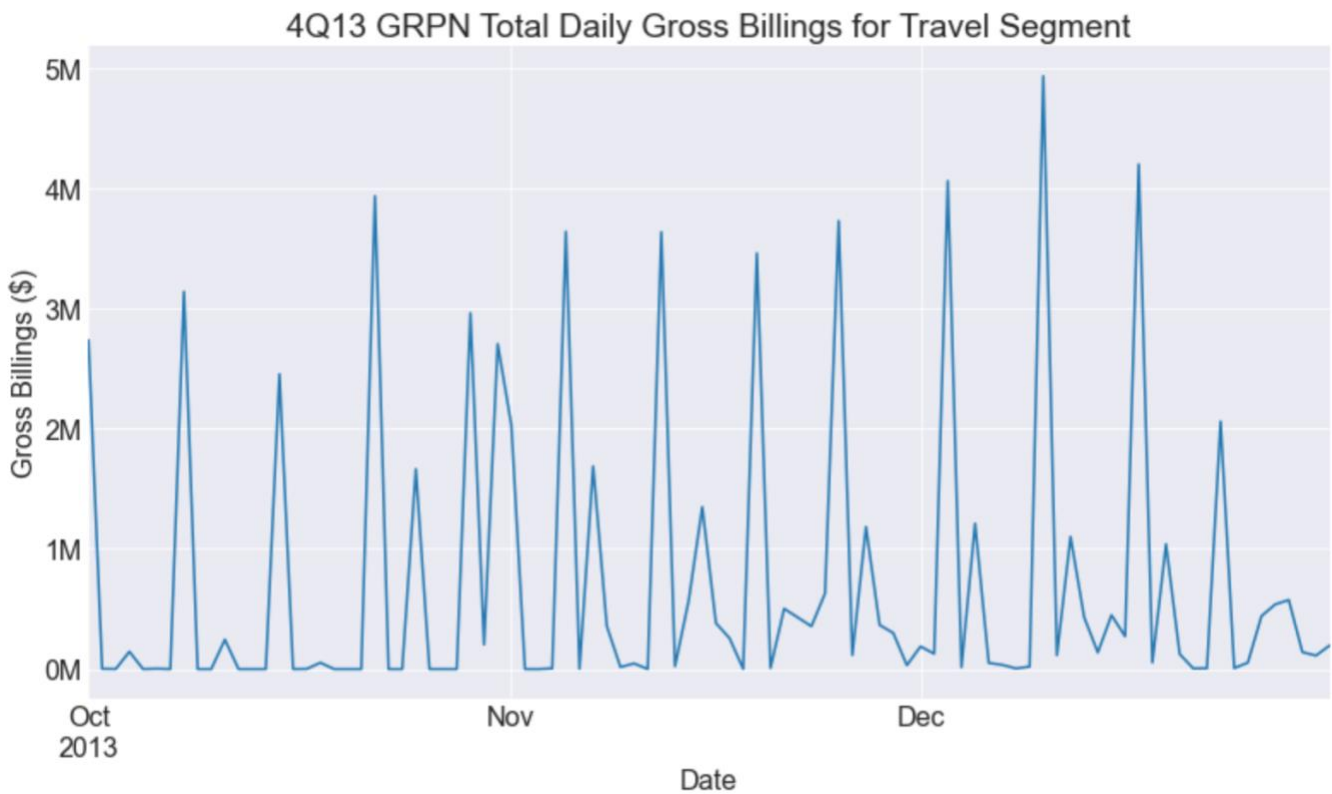


Figure 6. There doesn't appear to be any missing data for this segment.

9. I took the sum of gross billings in 4Q13 for the Travel segment using the provided data.
 - a. \$68 M
10. I split up this 4Q13 data into months and calculated totals (see Figure 7).

My Prediction	Q4 2013		
	Oct-13	Nov-13	Dec-13
Gross Billings (\$ million)			
Local	\$102.3	\$101.8	\$67.0
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Quarter Total	\$615.40		

Figure 7. My gross billings estimate by segment for 4Q13.

11. I calculated the margin for each quarter based on Groupon's historical reported metrics (see Figure 8).

	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013 (Avg)
Margin (%)						
Local	34.59%	27.72%	32.36%	34.27%	34.35%	32.66%
Goods	18.45%	9.44%	7.53%	13.70%	11.11%	12.05%
Travel	21.26%	20.02%	21.61%	20.43%	17.15%	20.10%
Total	29.07%	21.08%	25.30%	27.32%	25.80%	22.02%

Figure 8. Historical margins based on historical reported metrics.

12. I used these margins and the gross billings numbers to predict profit for 4Q13 (see Figure 9).

My Prediction	Q4 2013
Profit (\$ million)	
Local	\$88.5
Goods	\$33.3
Travel	\$13.7
Total	\$135.5

Figure 9. Profit estimates for 4Q13.

13. I then compared these numbers to the Sell-Side Consensus 4Q13 Estimates provided.

a. See commentary on irregularities found below.

Irregularities found:

- The estimated total gross billings for the Local segment was significantly lower than historical reported totals and sell-side consensus estimates.
 - This is even after missing data was imputed.
 - Based on my analysis and raw data provided, I have confidence in this estimate.
 - If this estimate is indeed correct, this would be very useful information for clients and investors since it varies so significantly from the expected numbers and would put them in an excellent position before quarterly numbers are actually reported.
 - They would be able to be proactive and position themselves to benefit from the reaction to the lower-than-expected numbers in the quarterly report.

Other Notes:

- Analysis was performed using Python, pandas, and matplotlib in a Jupyter Lab environment
 - Full analysis can be provided in .ipynb file, if desired
- An Excel spreadsheet was used to house tables
 - This can also be provided, if desired