Altitude Effects on Baseball Statistics and Park Factor

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Questions Sought To Answer

- The main question we are seeking to answer is whether or not altitude really has a significant effect on the game of baseball.
- We answered these questions by looking at offensive statistics such as batting average, runs per 9 innings, the ratio of home runs to total runs, and several more offensive stats.

Data Preparation

Data Cleaning: In order to prepare the data, we had to combine the statistics for Florida and Miami since they are the same team but changed cities.

Data Reduction: We had to go through our data and remove columns that we did not need, such as who was on base during the hit, or what the pitch count was. We had to group by stadiums for some statistics, so we had to combine all the results of statistics that had to do with each stadium. This made the data much easier to work with

Data Integration: We had to merge two tables, one with all the baseball data and one with all the altitude data, so that we had a table with both. This allowed us to test our correlations.

List of Tools

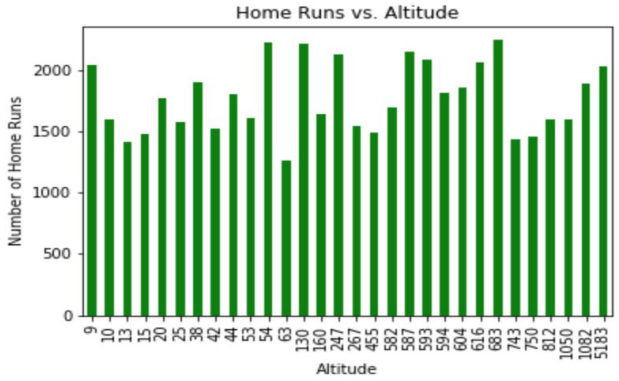
iPython Notebook to process our data
Pandas to manipulate and clean our data set
Numpy to test the data for correlation
MatPlotLib to visually represent our findings.

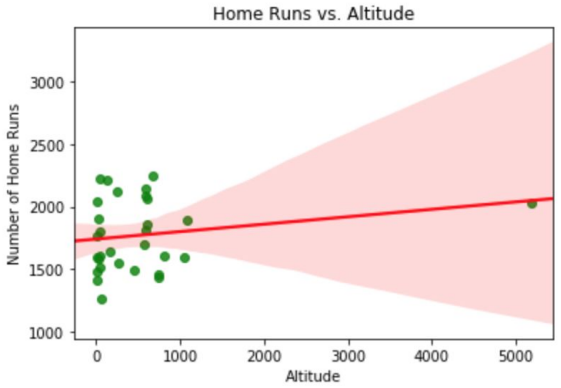
Procedure

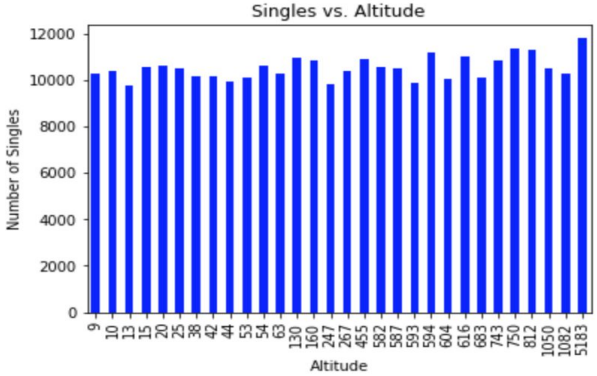
- Preprocess the data
- Run statistical tests on the dataset
- Determine key event correlations
- Evaluate results

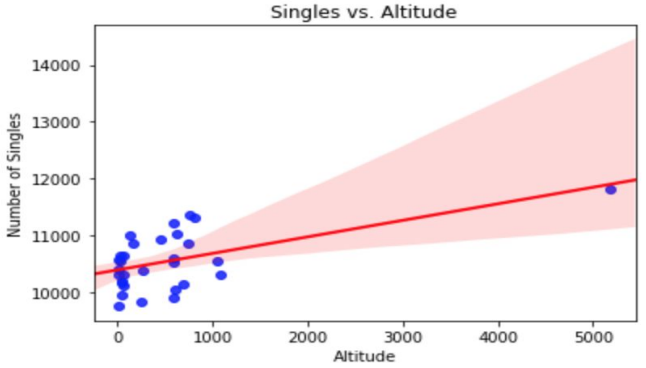
Results: Highest Correlation of Events

	event	correlation
1	strikeouts	-0.235383
4	caught stealing	-0.0922677
7	passed ball	-0.0839017
10	foul error	-0.0586253
13	hit by pitch	-0.0477827
2	stolen bases	-0.0329117
15	interference	-0.0126699
11	walk	0.0613119
14	generic outs	0.100284
0	generic outs	0.100284
16	error	0.117182
3	defensive indifference	0.117391
6	wild pitch	0.191274
21	home runs	0.19932
12	intentional walks	0.20928
8	balk	0.283827
9	other advance	0.289123
17	fielder's choice	0.289535
5	pickoff	0.365965
19	doubles	0.400911
20	triples	0.517608
18	singles	0.555642

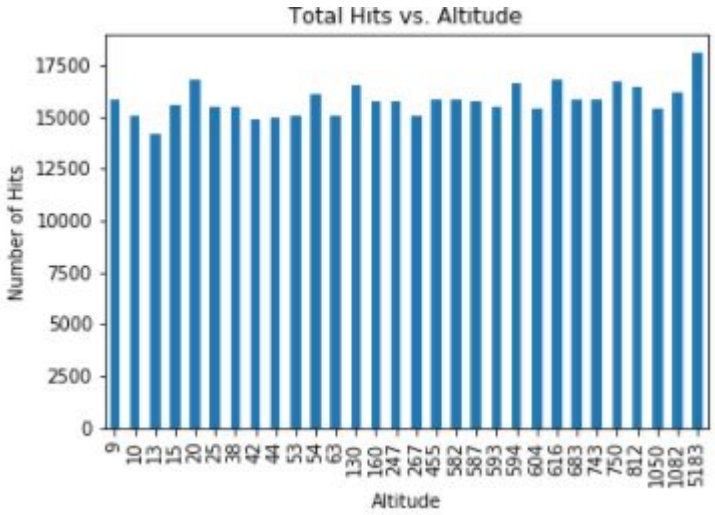


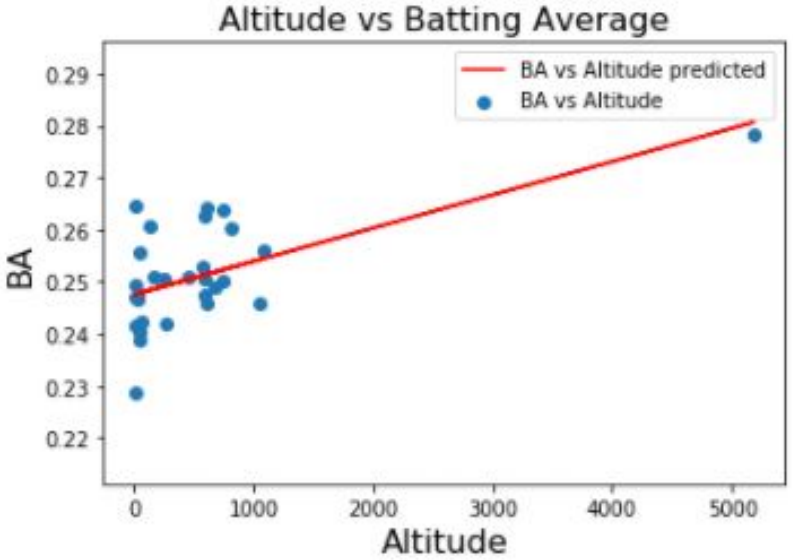






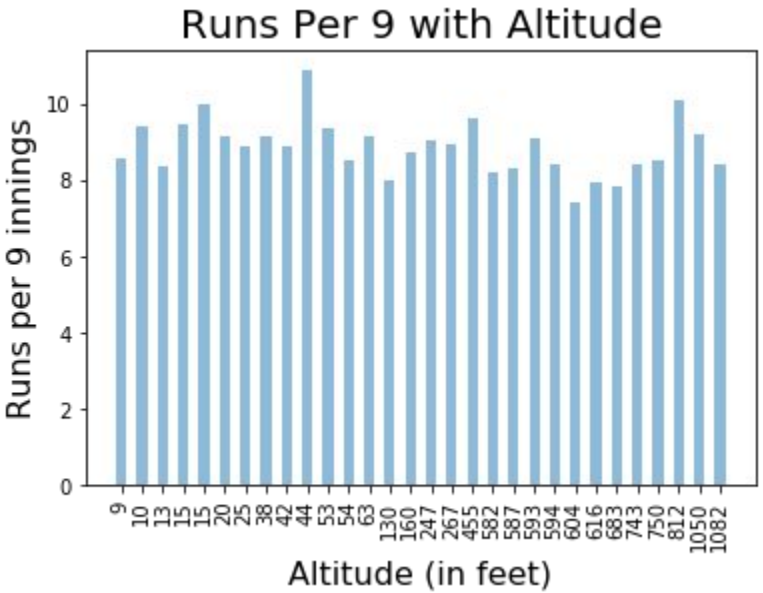
Results: Total Hits & Batting Average vs. Altitude

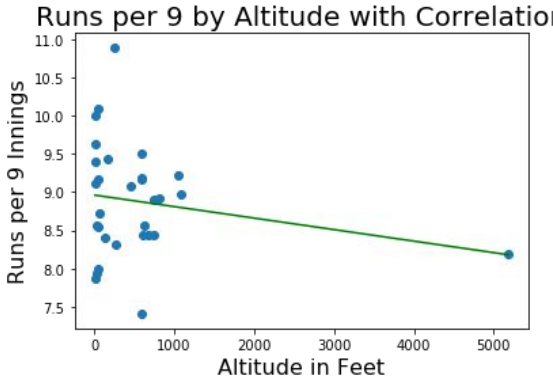


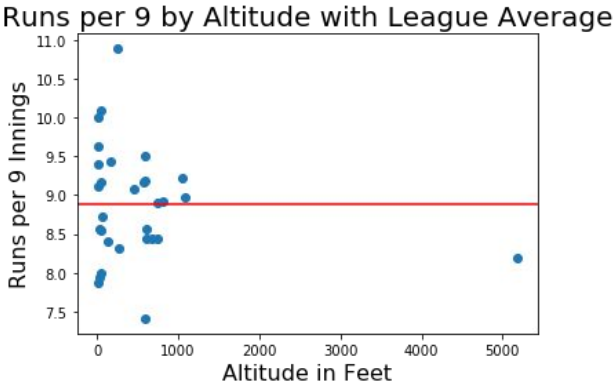


The correlation between BA and Altitude is 0.613893390432

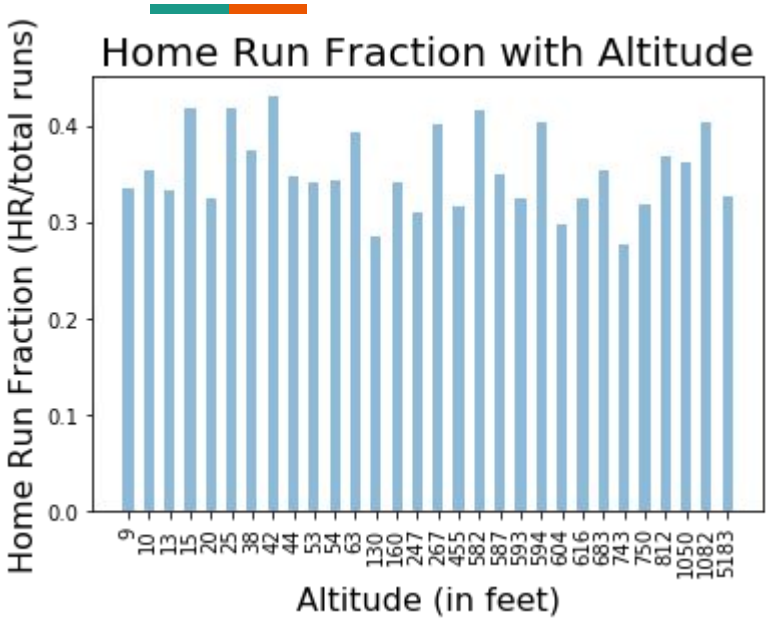
Results: Runs Per 9

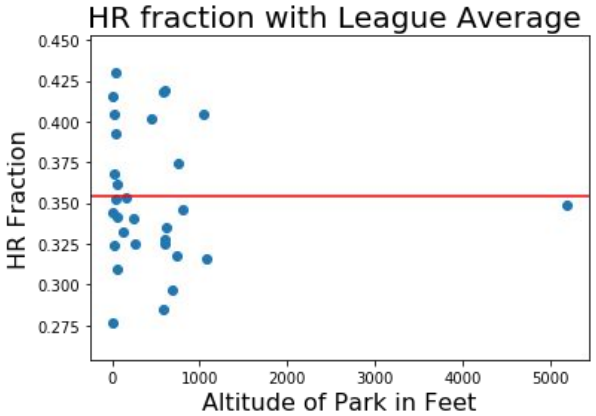


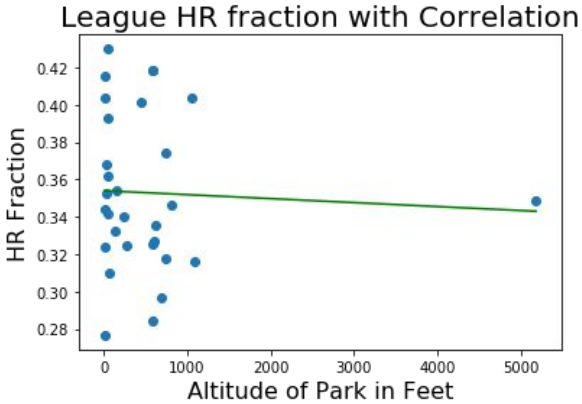




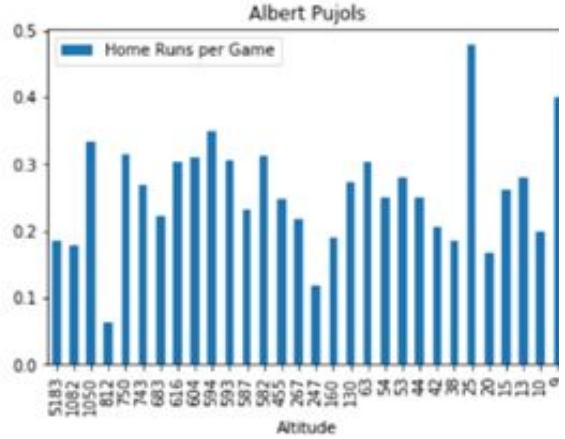
Results: HR Fraction

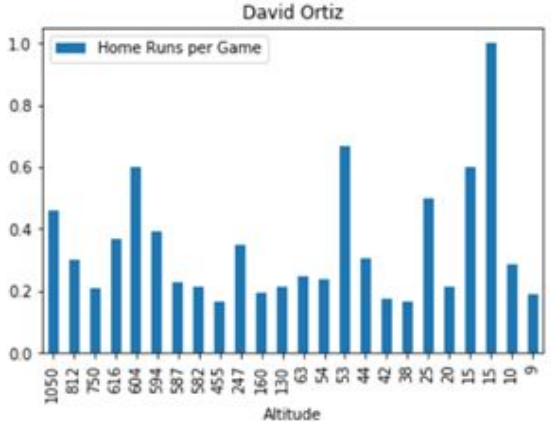


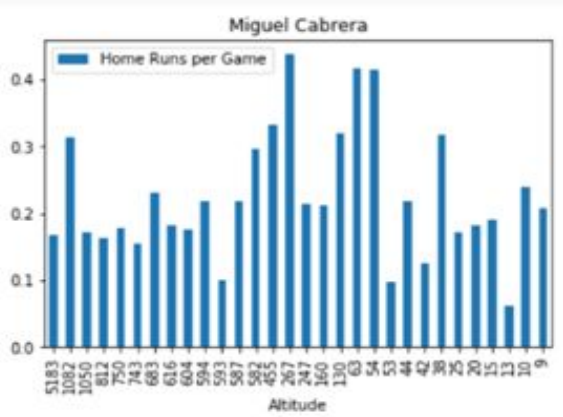


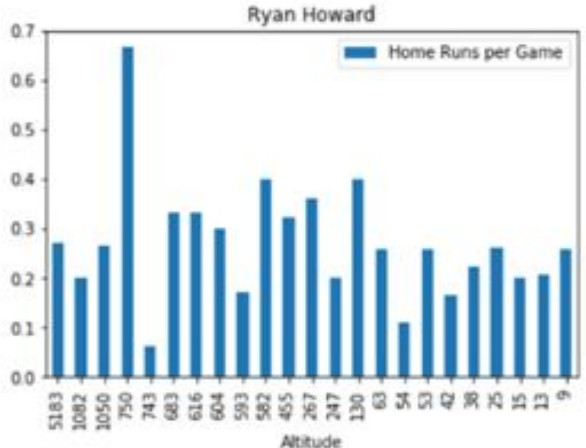


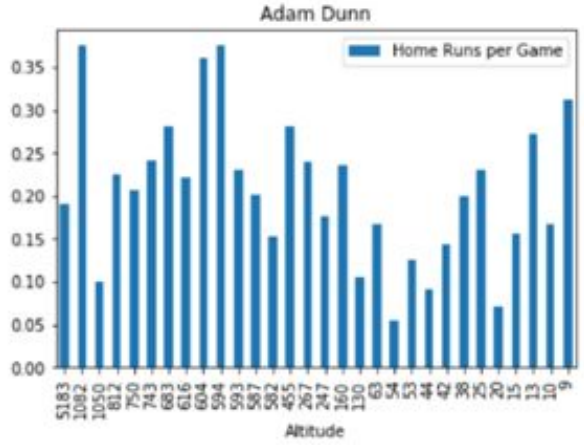
Results: Player Stats











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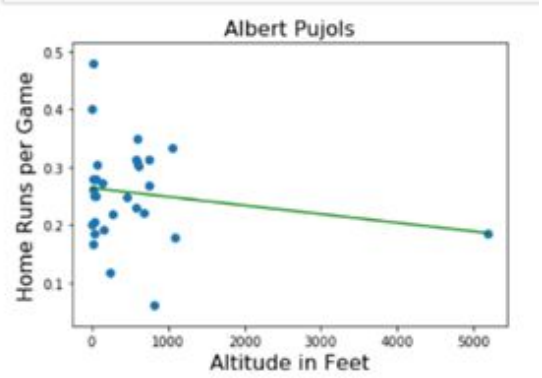

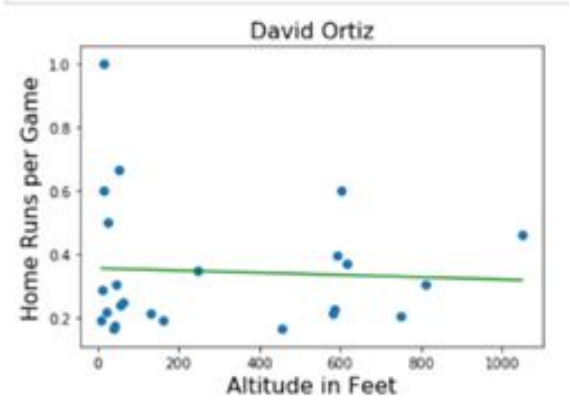

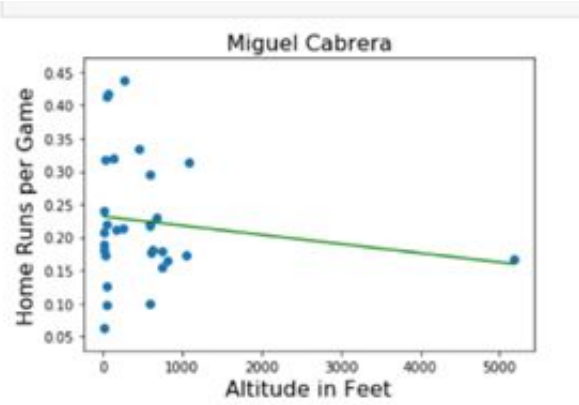

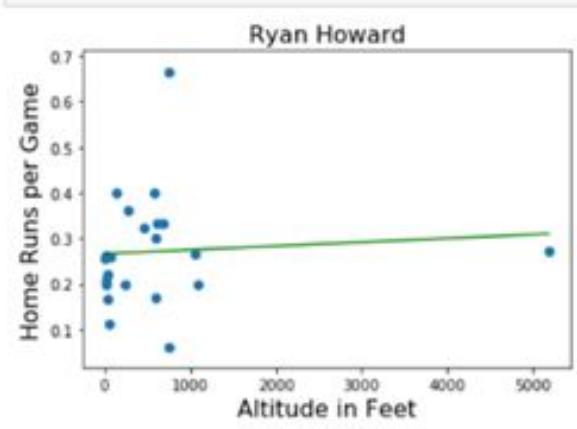

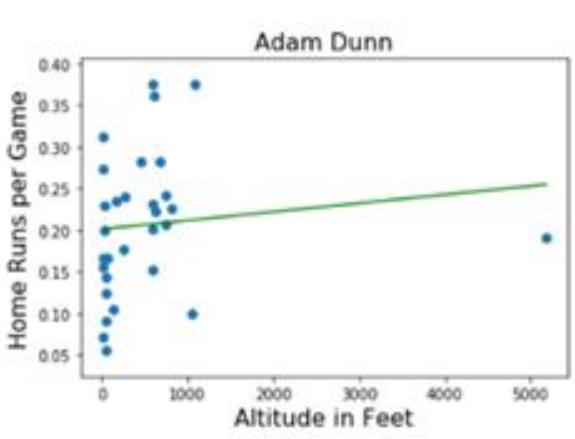

How the Results Can Be Applied

- Humidor is working based on our research.
- Scientifically the offensive stats should be higher, but our results say that altitude doesn't play much of a factor
- Look into other factors:
  - Park dimensions, wind speed, etc.