Las Vegas Hotel Rating Layer 2: Collection, Cleaning, and Analysis

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Moro, S., Rita, P., & Coelho, J. (2017). Stripping customers' feedback on hotels through data mining: The case of Las Vegas Strip. Tourism Management Perspectives, 23, 41-52.

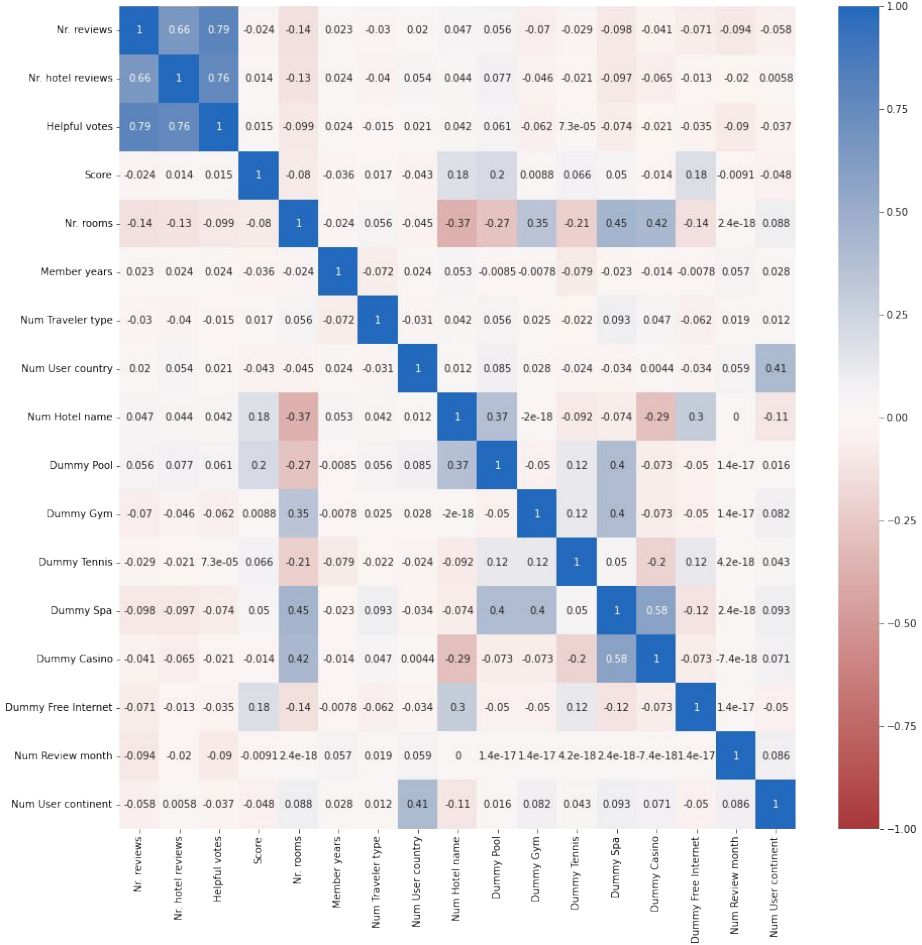
Wrangling/Cleaning

- Dropped columns
  - ‘User continent’
  - ‘User country’
  - ‘Review month’
  - ‘Review weekday’
  - ‘Casino’
  - ‘Free internet’
- Un-dropped columns and started over with fresh data set- misled at start
- Created dictionary for remaining categorical variables to make numerical
  - Used for loop to run through all unique variable names
- Turned all ‘Yes’/ ‘No’ variables into dummy variables to be used as booleans
- Ready for analysis

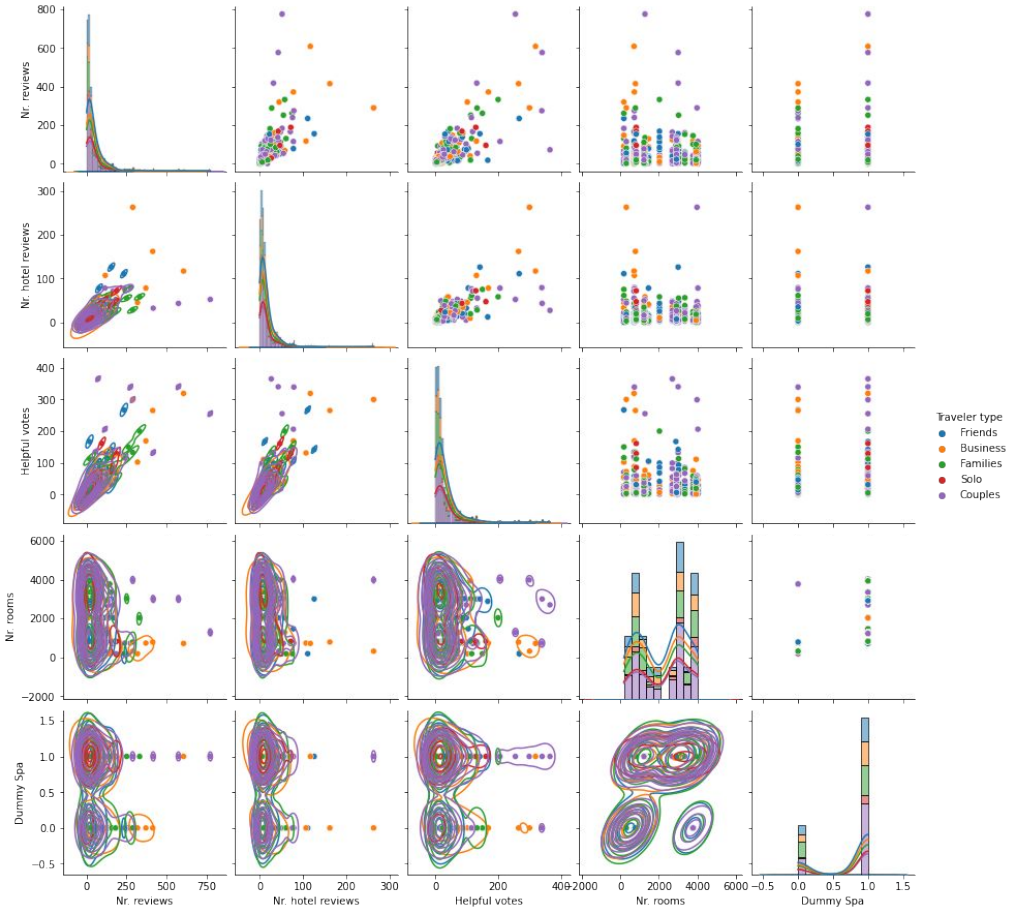
Analysis

- Did a Five Number Summary and Correlation
  - Used df.describe() and df.corr()
- Created a heatmap to better visualize correlation between variables
- Created a pair plot with the 5 highest correlated values and two other not as correlated variables
  - These variables included Nr. Reviews, Nr. Hotel Reviews, Helpful votes, Nr. rooms, Dummy Spa
- Created individual histograms for each variable included in pair plot
- Created a box-plot that showed distribution of scores for different traveller types

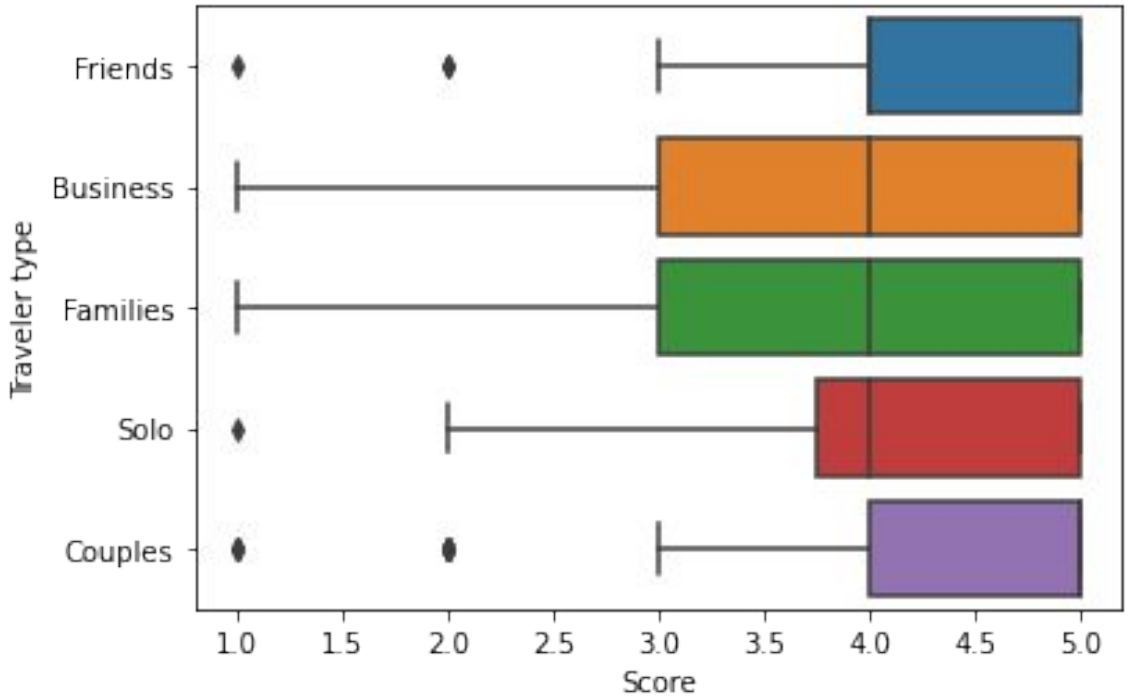
Heat Map


Nr. reviews 1 0.66 0.79 -0.024 -0.14 0.023 -0.03 0.02 0.047 0.056 -0.07 -0.029 -0.098 -0.041 -0.071 -0.094 -0.058
Nr. hotel reviews 0.66 1 0.76 0.014 -0.13 0.024 -0.04 0.054 0.044 0.077 -0.046 -0.021 -0.097 -0.065 -0.013 -0.02 0.0058
Helpful votes 0.79 0.76 1 0.015 -0.099 0.024 -0.015 0.021 0.042 0.061 -0.062 7.3e-05 -0.074 -0.021 -0.035 -0.09 -0.037
Score -0.024 0.014 0.015 1 -0.08 -0.036 0.017 -0.043 0.18 0.2 0.0088 0.066 0.05 -0.014 0.18 -0.0091 -0.048
Nr. rooms -0.14 -0.13 -0.099 -0.08 1 -0.024 0.056 -0.045 -0.37 -0.27 0.35 -0.21 0.45 0.42 -0.14 2.4e-18 0.088
Member years 0.023 0.024 0.024 -0.036 -0.024 1 -0.072 0.024 0.053 -0.0085 -0.0078 -0.079 -0.023 -0.014 -0.0078 0.057 0.028
Num Traveler type -0.03 -0.04 -0.015 0.017 0.056 -0.072 1 -0.031 0.042 0.056 0.025 -0.022 0.093 0.047 -0.062 0.019 0.012
Num User country 0.02 0.054 0.021 -0.043 -0.045 0.024 -0.031 1 0.012 0.085 0.028 -0.024 -0.034 0.0044 -0.034 0.059 0.41
Num Hotel name 0.047 0.044 0.042 0.18 -0.37 0.053 0.042 0.012 1 0.37 -2e-18 -0.092 -0.074 -0.29 0.3 0 -0.11
Dummy Pool 0.056 0.077 0.061 0.2 -0.27 -0.0085 0.056 0.085 0.37 1 -0.05 0.12 0.4 -0.073 -0.05 1.4e-17 0.016
Dummy Gym -0.07 -0.046 -0.062 0.0088 0.35 -0.0078 0.025 0.028 -2e-18 -0.05 1 0.12 0.4 -0.073 -0.05 1.4e-17 0.082
Dummy Tennis -0.029 -0.021 7.3e-05 0.066 -0.21 -0.079 -0.022 -0.024 -0.092 0.12 0.12 1 0.05 -0.2 0.12 4.2e-18 0.043
Dummy Spa -0.098 -0.097 -0.074 0.05 0.45 -0.023 0.093 -0.034 -0.074 0.4 0.4 0.05 1 0.58 -0.12 2.4e-18 0.093
Dummy Casino -0.041 -0.065 -0.021 -0.014 0.42 -0.014 0.047 0.0044 -0.29 -0.073 -0.073 -0.2 0.58 1 -0.073 -7.4e-18 0.071
Dummy Free Internet -0.071 -0.013 -0.035 0.18 -0.14 -0.0078 -0.062 -0.034 0.3 -0.05 -0.05 0.12 -0.12 -0.073 1 1.4e-17 -0.05
Num Review month -0.094 -0.02 -0.09 -0.0091 2.4e-18 0.057 0.019 0.059 0 1.4e-17 1.4e-17 4.2e-18 2.4e-18 -7.4e-18 1.4e-17 1 0.086
Num User continent -0.058 0.0058 -0.037 -0.048 0.088 0.028 0.012 0.41 -0.11 0.016 0.082 0.043 0.093 0.071 -0.05 0.086 1
Nr. reviews
Nr. hotel reviews
Helpful votes
Score
Nr. rooms
Member years
Num Traveler type
Num User country
Num Hotel name
Dummy Pool
Dummy Gym
Dummy Tennis
Dummy Spa
Dummy Casino
Dummy Free Internet
Num Review month
Num User continent
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00

Pair Plot


Nr. reviews
Nr. hotel reviews
Helpful votes
Nr. rooms
Dummy Spa
Traveler type
Friends
Business
Families
Solo
Couples

Box Plot


Friends
Business
Families
Solo
Couples
Traveler type
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Score

Preliminary Results

- Weak correlations for score
  - Hotel name, Pool, Free internet
- Backwards elimination

➔ What has proved harder than expected to this point?
- Determining how to subset the data, and comparing boolean values to numeric values

➔ What revisions have you made to your expected modelling efforts?
- Based on quantitative data, not common sense/our ideas

➔ What have you learned about your data and the topic in general?
- There is a lot of comparisons that can be made and a lot of potential predictors

Next Steps

- Examine ‘Traveler type’ variable more closely
  - Correlations with each other column
  - Sample size for each traveler type
- Look at correlations for each traveler type individually
- Determine which graphical display demonstrates data best
- Determine correlation with each boolean variable
- Subset score and traveller type and compare correlation values to determine best predictor variables

Schedule

- **Part 3: Due 16 November 2021**
  - Paper draft
  - Finished by November 9
    - Introduction: Peyton
    - Data and methods: Christopher
    - Results: Brandon (Christopher + Peyton as needed)
  - Demonstration
  - Practice on November 12
  - Walk/talk through of code/results
    - How the model works: Christopher
    - Preliminary results on “predictive power”: Brandon
    - Trade-offs and challenges: Peyton
- **Part 4: Due 16 December 2021**
  - Completed research paper
    - Done by Dec. 13
    - Discussion : Christopher + Brandon
    - Conclusion : Peyton
  - Presentation
    - Work on leading into Dec. 16
  - Demonstration
    - Walk/talk through
    - Date to be determined

I have neither given or received, nor have I tolerated others’ use of unauthorized aid.
Peyton Camden, Christopher Barua, Brandon Cook