Application Evaluation Challenges

Overview

You will have 72 hours to complete the test. The goal of this set of challenges is to highlight your current capabilities to match what you may be asked to do on the job. The time limit assists in how you approach the challenges and communicate your results. TED talks are great because each speech has a time limit so only what is truly important is included.

Similarly, the goal is for you to provide your best work, put it great work, and communicate everything that is most important. If there is any point in this application that requires an assumption to be made, please document. Again, a major focus of the role is to be able to communicate technical aspects to our leadership teams and that includes what data is used, how it is processed, assumptions that are made, data insights, and potentially any directional advice.

This challenge should take 4-6 hours to complete and must be returned by email within the time limit.

Responses can be in a word document, Jupyter notebook, and/or PowerBI file.

Challenges

Challenge 1 – Reverse engineer a Publicly Available Index

At Signorelli, there are home sales and home rental divisions. Some factors really push buyers/renters to choose which side of the market they want to select for their homes. Understanding where the market is helps these divisions navigate approaching prospective clients as well as point buyers to the best product for their lifestyle.

There exists an index known as the Beracha, Hardin, and Josh Buy vs Rent index to signal whether current market conditions favor buying or renting a home in terms of wealth creation over a fixed holding period. The index is currently publicly available and covers the US and select metro cities. **It is our interest to reverse engineer this index to apply this to our Texas regions of activity.** This is a backward looking index and this doesn't include forecasting.

The requirement is to reverse engineer the index using the information provided, data sets supplied and other factors you can obtain and explain. Your result does not require to mimic the exact results or comes to the same formula. The concepts should be applied and a cohesive story explaining how a similar index and trends are created.

Your response should convey how you arrived with your solution, assumptions made in the program, and any suggestions for improvement.

References

- General Description Located here: https://business.fau.edu/departments/finance/real-estate-initiative/bhj-buy-vs-rent-index/

    - Select MSAs: https://business.fau.edu/departments/finance/real-estate-initiative/bhj-buy-vs-rent-index/bhj-data-and-graphs/
    - Raw Data Link: https://business.fau.edu/images/business/finance/departments-finance-pages/real-estate-intiative/bhj_buy-vs-rent/data-and-graphs/BHJ%20Index%20Q1_1982-Q3_2020.xlsx
- Methodology Statement: https://business.fau.edu/departments/finance/real-estate-initiative/bhj-buy-vs-rent-index/bhj-index-methodology/
- (*) Methodology Document: https://business.fau.edu/images/business/finance/departments-finance-pages/real-estate-intiative/bhj_buy-vs-rent/index-methodology/2015-06-08-Beracha-and-Johnson-2012.pdf

B. Data Sources to Consider (Don't have to use)

- Freddie Mac – 30 Year Fixed Rate Mortgage: https://fred.stlouisfed.org/series/MORTGAGE30US
- QuanDL Source: https://www.quandl.com/data/FMAC/30US-30-Year-Fixed-Rate-Mortgage-Average-in-the-United-States
- Zillow Housing Data: https://www.zillow.com/research/data/
- FHFA HPI Index: https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx#mpo
- CSV File (Metros & US): https://www.fhfa.gov/HPI_master.csv
- Dr French's Data Library: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Challenge 2: Power BI Knowledge and Explanation

The intent of this is the see where your PowerBI knowledge is. Whether or not you have extensive PowerBI background, most of these answers can be searched for and figured out. If you know these quickly, great! If you do not, it is important that you are able to search for and find solutions independently. Googling is encouraged.

Each response should only be a few sentences at the most.

a) Describe the difference between AVERAGE() and AVERAGEX() in DAX. Explain, using an example, of when it is important to use each one.

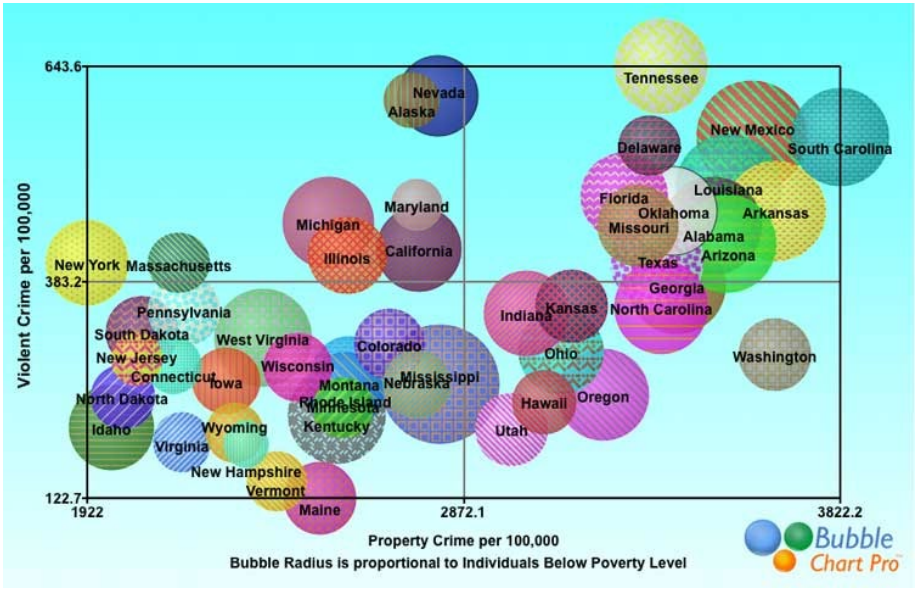
b) Describe the difference between the M language and DAX. Where is each on used in PowerBI?

c) What is 'context' as described in PowerBI? What is the difference between putting filters within the measure and letting the 'context' determine the calculation parameters?

Challenge 3: Good or Bad?

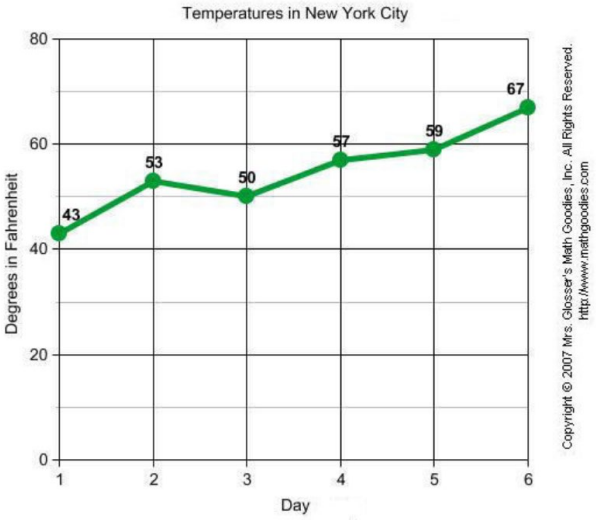
In each of the graphs below, choose whether the visual is good or bad. Then support your answer with aspects of the graph/visual that led to your decision

a)

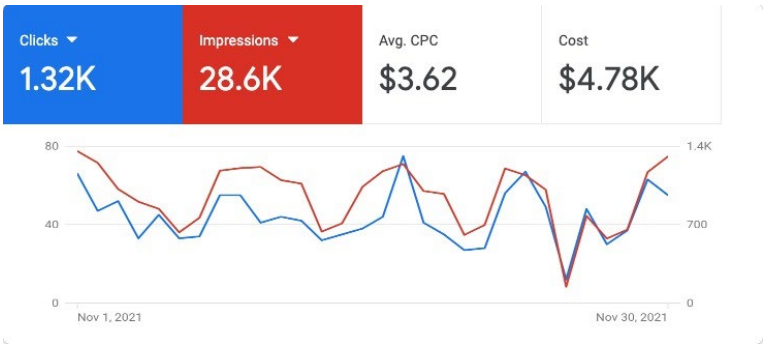


Crime and population data

b)

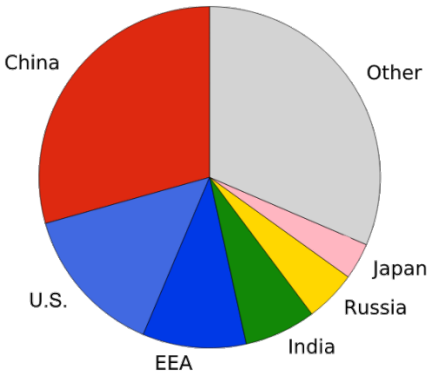


Weather data visulation



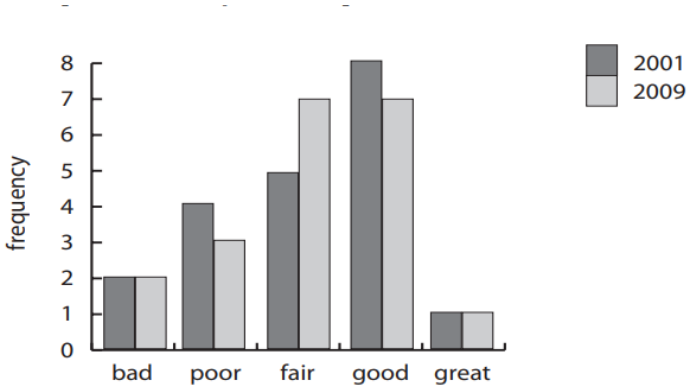
c) Marketing data visualization

d) Sales data visualization



e) Demographic data visualization

f)



Health statistics visualization