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Retirement Ranks Analysis Using Microsoft PowerBI

In this project, I received a dataset that contained ranking information for all fifty states. This dataset contained numerical ranks such as overall, affordability, well-being, healthcare, weather, and crime. The main goal of this analysis was to determine the best states to retire in. I based my analysis on two encompassing questions that someone may ask when looking at the data. First, I looked at it from the point of view of a retiree. A retiree would want the data that directly pointed out what states are best such as a simple top 10. After selecting and narrowing down states, they would want to see details of why some states are better than others. Second, I looked at it from the point of view of someone trying to improve or get more information about the retirement rank of their state. This group would need more detailed information. Regardless, anyone looking at the report would need to be able to easily derive insights from the data. I tried to create the report based on an audience that requires both simplicity and detail.

The first question that came to mind was what are the top 10 states and what are the bottom 10 states based on overall rank. This became the basis for the first page of my report. This revealed that the top 10 states by overall rank were Iowa, Delaware, West Viginia, Missouri, Mississippi, Wyoming, Pennsylvania, Florida, Hawaii, and Nebraska. Likewise, the bottom 10 states were Louisiana, Maryland, Colorado, Texas, North Dakota, Massachusetts, Washington,

California, New York, and Alaska. This could give retirees an overall view of the best and worst states and maybe help them narrow down which ones to research deeper.

Analyzing states by overall rank led me to the question of how overall rank was determined based on contributions by the other ranks in the dataset. Using a regression function in Microsoft Excel's Data Analysis Tool pack, I was able to determine the correlation coefficient of the other ranks by supplying them with x-values for the y-value of overall rank. I then imported this data into PowerBI and calculated the percentages to be used in a pie chart that detailed the percentage contributions of each category to overall rank. This was one of my favorite graphs because it revealed that the reason some states perform so well despite scoring low in some ranks is because not all ranks carry the same weight. Affordability is the biggest rank, being factored at approximately 44.13% into the overall rank. Well-being also plays a fairly large role at 24.21%. Although the other ranks contribute, they are significantly smaller with quality/cost of healthcare, weather rank, and crime rank coming in at only 16.64%, 9.85% and 5.35% respectively. This data is useful because it points out that affordability is most people's biggest concern when ranking a state, and it helps the people base their decision on this data determine how well it aligns with their values.

My "Overall Rank vs. Average Rank" page gave insights into how the overall rank of all the ranks compares to the overall rank. Average rank is a measurement without weight and instead factors in a state's scores equally. The main thing that the line graph on this page revealed was that there is little correlation between average rank and overall rank. It is a useful graph especially if someone wants to compare a state based on how it did on averages. One interesting fact I found was that Connecticut scored highest with an average rank of only 14.50, but due to

an affordability rank of 44, it only made it to 21st in the overall rank. This same analysis could be done for any of the states.

The average rank analysis led into the comparison of rank difference. Using a DAX formula of Difference = [Average Category Rank] - [Overall Rank], I was able to determine the states that correlated closely to their overall rank based on the average of their individual ranks, and I was able to determine the states that exhibited a large difference. What I found out was that states with a positive rank difference exhibited worse performance in some categories compared to overall rank, while states with a negative rank difference performed better in some categories compared to overall rank. This means that states with large rank differences may not necessarily be capturing the state's true performance in the overall rank. For example, Missouri exhibits the highest positive rank of any state. This is because, despite scoring 4th based on overall rank, Missouri scores quite low in all ranks aside from affordability. This is useful for decision making because it can give insights into how well the data is portraying a state's performance.

Lastly, I examined the top states in each category. This is a useful page for narrowing down values. If someone is more interested in affordability, then they can determine which states excel in that area. Likewise, if someone wanted good weather, they could determine the best states there. This was an insightful view because there was a strong correlation with ranks such as affordability and overall rank. Generally, if a state did well in affordability, they could withstand slightly lower ranks in the other categories and keep a good spot in the overall rank due to affordability being such a top category in the overall rank calculations. This analysis supported the results of the regressions analysis.

Overall, this data provided an interesting introduction to PowerBI that allowed me to derive insights that I would have never thought to look for before. Aside from basic filtering, using regression analysis to see how ranks factored into overall rank and using average and rank differences to compare state's performance allowed me to gain and convey insights into what on the service would appear as a simple dataset. This dataset, however, had much more information that could be extracted by using visualizations, filters, and calculations. A report such as this would be invaluable for someone researching this dataset as it transformed the raw data into useful information.