



Data Analyst: SQL Portfolio

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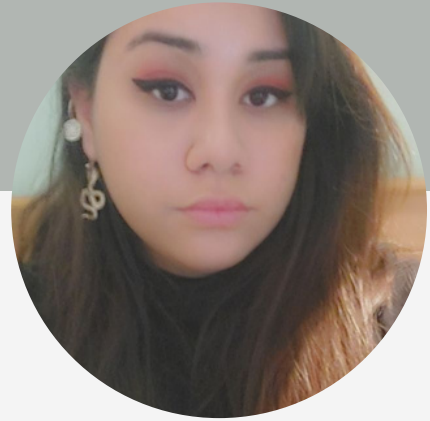


Professional Background

Hi there, I'm Aaliyah Motala. I have a BSc honors degree in Biological Science. My background is in biology, research, and data analysis.

I started my professional career off with the South African National Biodiversity Institute (SANBI) where I was tasked with database management, social media management, and the City Nature Challenge eThekwin 2020. Thereafter I was a research assistant at UKZN.

In 2022, I've realized that I have a passion for data analysis and I want to pursue this career field. I love finding out trends and different ways people think.



Data Skills:

- **R**
- **SPSS**
- **Tableau**
- **SQL**
- **SAS**

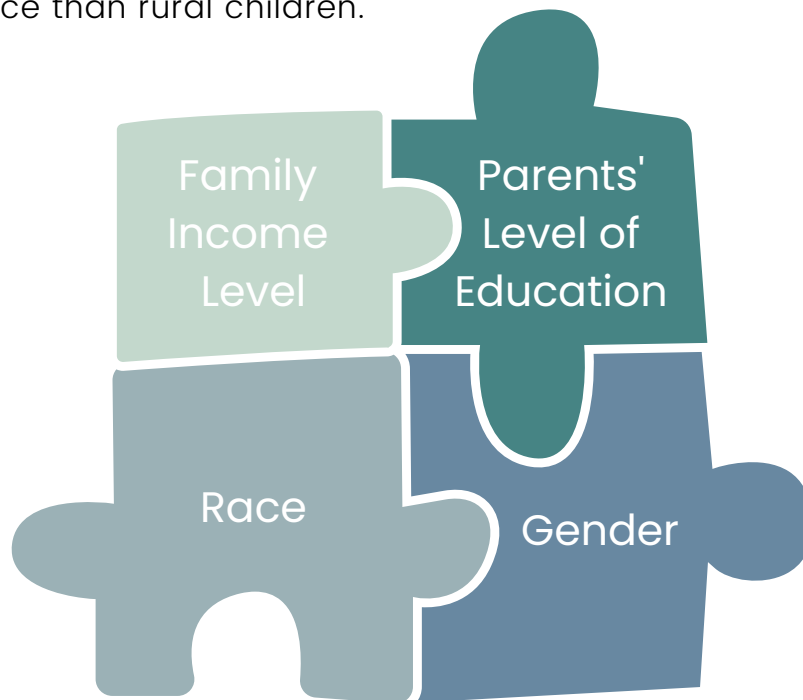


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Introduction

The education of a child has many factors such as parent's education, family income, and area/neighbourhood to name a few. According to Wolla and Sullivan (2017), people with more income tend to invest more in education as they have more money to use. Poor families have a limitation on family income, therefore are not able to invest sufficiently in their children's education, which in turn affects their children's academic scores. It was also found that a parent's educational background and socioeconomic background have a significant positive role in a child's academic scores (Fang and Feng, 2008). Interestingly, Li and Qiu (2018) found that urban children have significantly better academic performance than rural children.



Socioeconomic Factors Affecting Education
(Jennifer, K. 2018)

In this analysis, we're going to look for any trends relating the socioeconomic factors affecting students in USA. Data was provided by EntryLevel. An SQL and Excel analysis will be performed.

Root Cause Analysis

Developed by Sakichi Toyoda, the root cause analysis aims to find the root cause of a problem by asking why 5 times. Sakichi stated that a problem is only a symptom of the deeper issues. The analysis helps prevent recurring problems.

Q: Why is there a decrease in academic scores in non-urban areas?

A: A decrease family's average income.

Q: Why is there a decrease family's average income.?

A: Parents do not have college education.

Q: Why does a parents not having a college education affect student?

A: Parents have less knowledge of child's studies to assist.

Q: Why does distance from a college matter?

A: The further the distance, the more money it would cost to move there.

Q: Why does the number of years of education matter?

A: The more educated, the higher the income.

Insights

The data was analyzed using SQLite and Excel. Each code and visualization would be explained under this insights section.

```
CREATE TABLE reports_student_colleges
SELECT *
  FROM student_personal_details as spd
 LEFT JOIN county_info as ci
 ON spd.id = ci.id
 LEFT JOIN student_academic_info as sai
 ON spd.id = sai.id
 LEFT JOIN student_family_details as sfd
 ON spd.id = sfd.id
```

Four datasets were received and to start analysis, the four datasets were joined on SQL to create a reporting table. Thereafter, the data was manipulated to find any insights as seen in the next few pages.

Insights

SELECT

```
id,  
academic_score,  
education,  
distance,  
region
```

FROM

```
reports_student_colleges
```

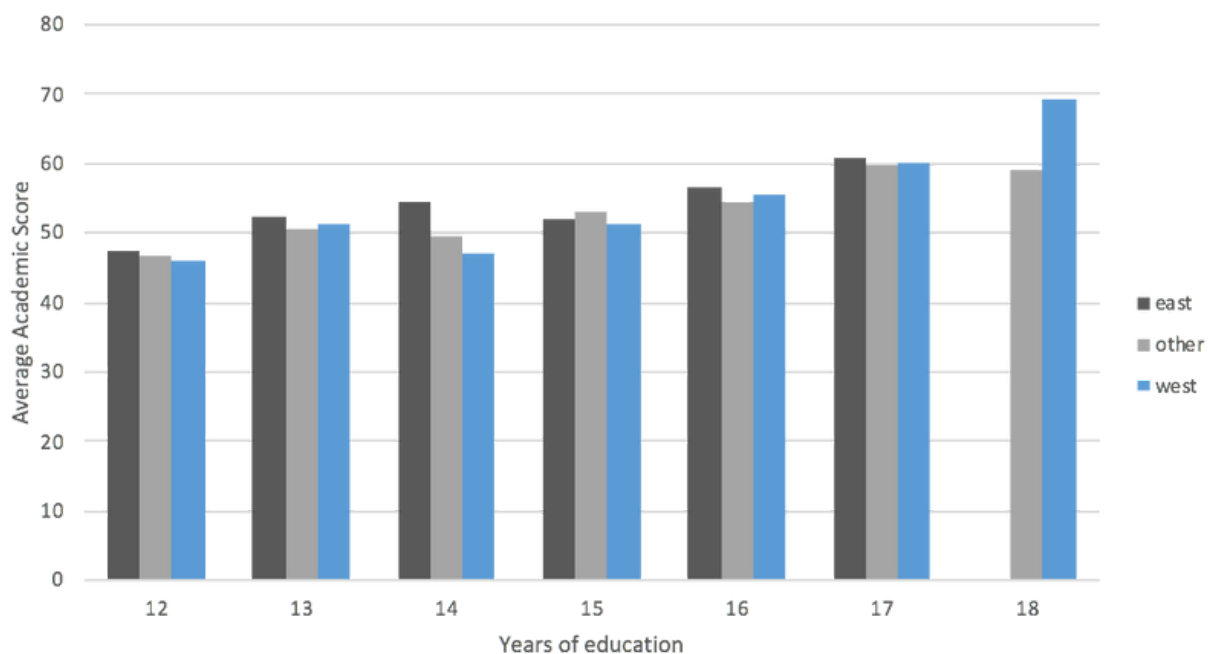


Figure 1: The average academic score for the different years of education in the different regions.

Insights

Table 1: The average values for the academic score for the different years of education in the different regions.

Education (years)	East	Other	West	Grand Total
12	47.32	46.69	45.92	46.63
13	52.18	50.67	51.34	50.97
14	54.35	49.40	46.92	50.22
15	52.02	53.03	51.39	52.48
16	56.45	54.39	55.41	55.02
17	60.67	59.80	60.17	60.03
18		58.99	69.30	60.71
Grand Total	52.12	50.92	50.06	51.00

The average academic score for students based on the total number of years in various regions is shown visually by figure 1 and numerically by table 1. Figure 1 shows us that year 12 and 13, the averages across the reasons are reasonably close. Year 18 is the interesting year of education. You can clearly see that there is no one in the East with 18 years of education. This is surprising as the East has a higher academic score against the West region for all the years besides 18. Although, missing the Easts score for year 18, this was the Wests highest academic score.

Insights

SELECT

```
id,  
income,  
education,  
wage,  
region
```

FROM

```
reports_student_colleges
```

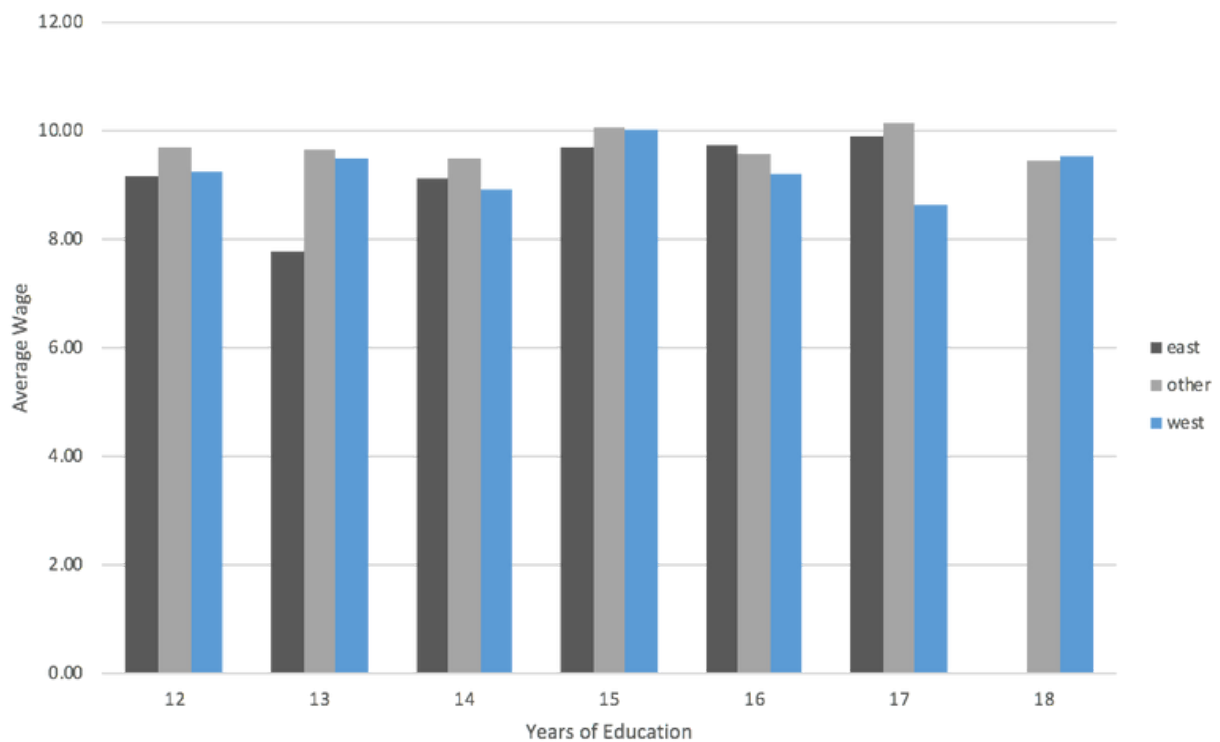


Figure 2: The average wage for the different years of education in the different regions.

The average wage for people based on the total number of years in various regions is shown visually by figure 2. Year 18 has no values for people who are from the East. 13 years of education showed the lowest average wage for the East region while year 17 was the lowest for West. Contradicting the West, year 17 has the highest wage for the East while year 15 has the highest average wage for the West.

Insights

SELECT

```
id,  
income,  
education,  
home,  
urban
```

FROM

```
reports_student_colleges
```

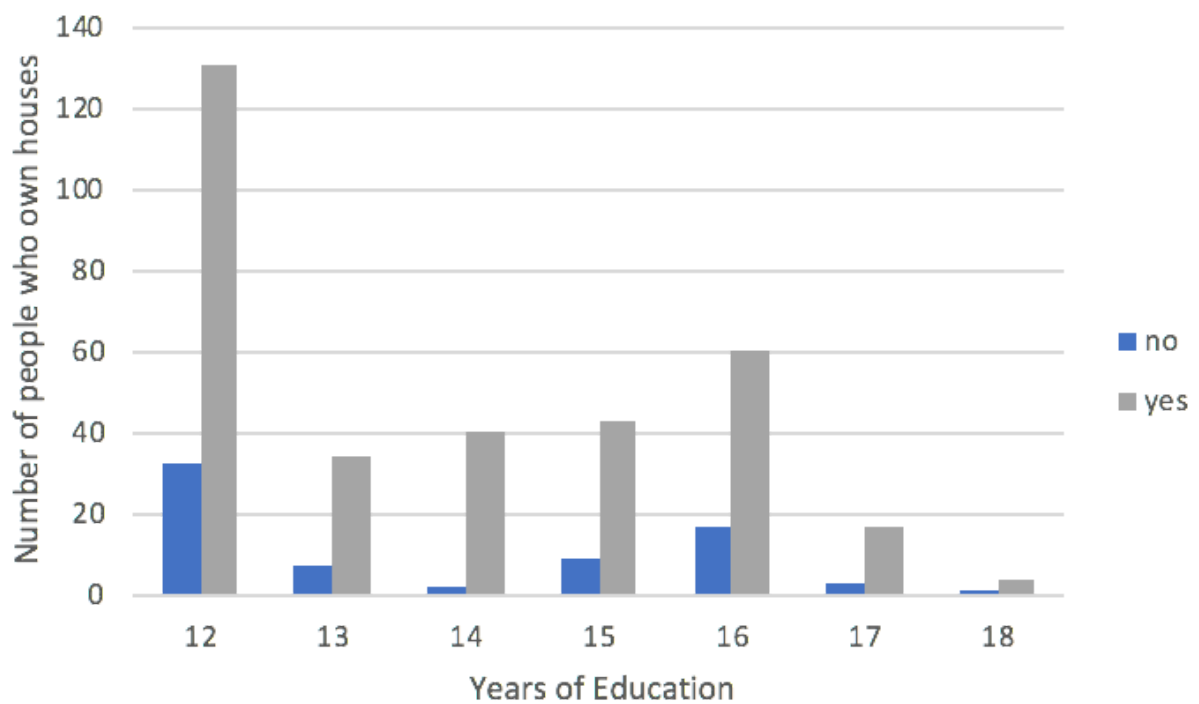


Figure 3: The total number of people who own houses for the different years of education

The total number of people who own houses vs their years of education. This is unprecedented as the highest number of people only have 12 years of education.

Insights

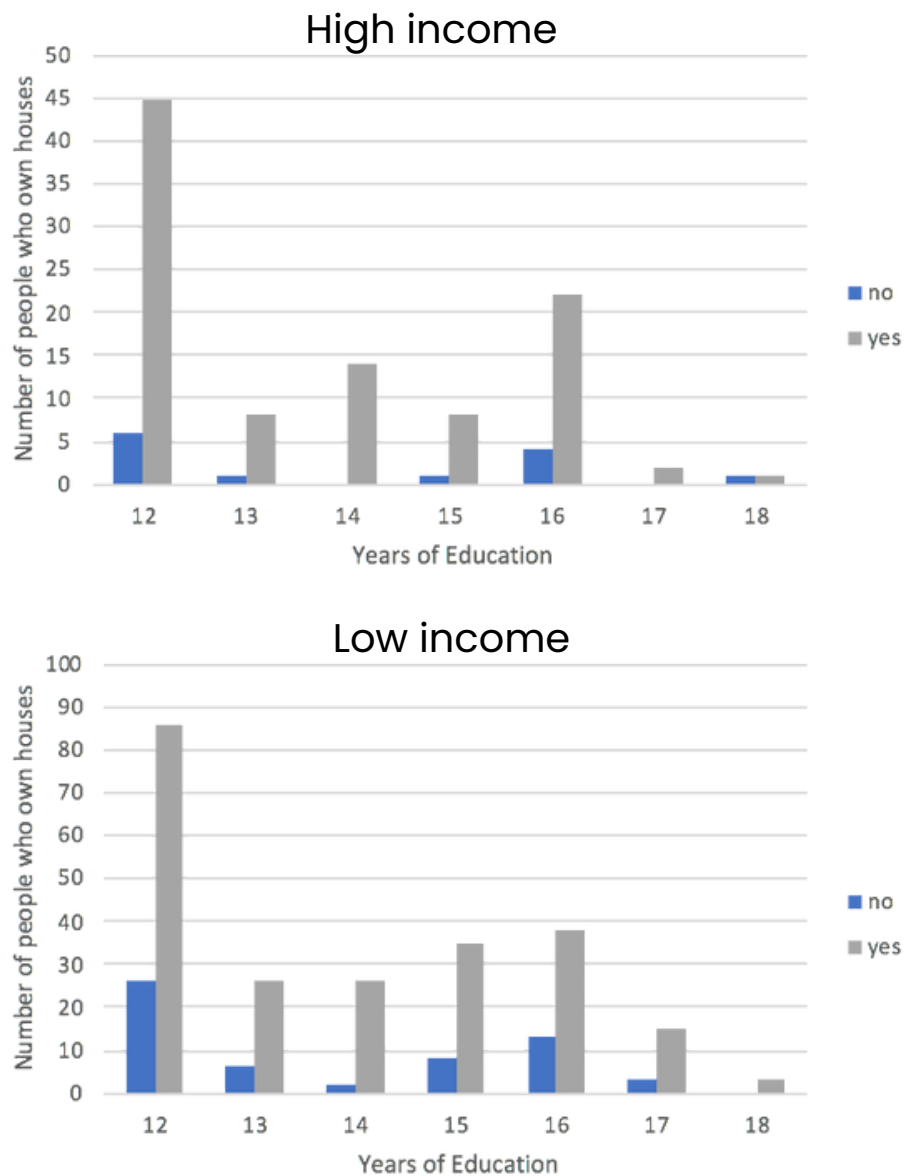


Figure 4: The total number of people with high income vs low income who own houses for the different years of education

It would be an interesting trend to see if people with high income own more houses than people who have a low income. The results were unpredictable as there's a large difference between high and low income results. People with low income own more houses than people with high income. The large difference can be seen in 12 years of education bars, high income its around 45 people with low income being 85 people.

Insights

SELECT

```
id,  
urban,  
home,  
fcollege,  
mcollege
```

FROM

```
reports_student_colleges
```

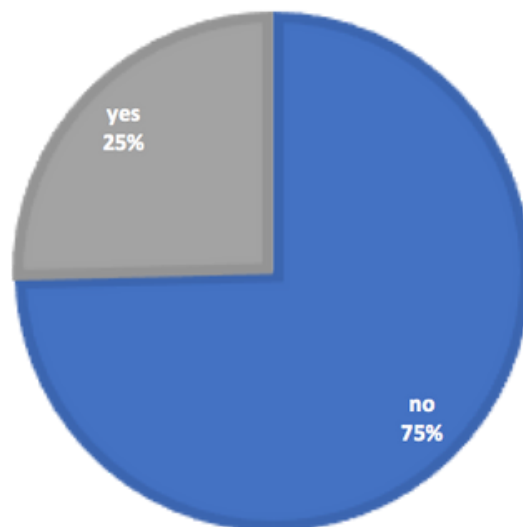


Figure 5: The percentage of people who own homes in urban areas

Following the previous insight of high and low income own homes, I've decided to see if there's a difference between urban and non-urban as well as parents education. From figure 4 we can see that only 25% of people own homes in urban areas.

Insights

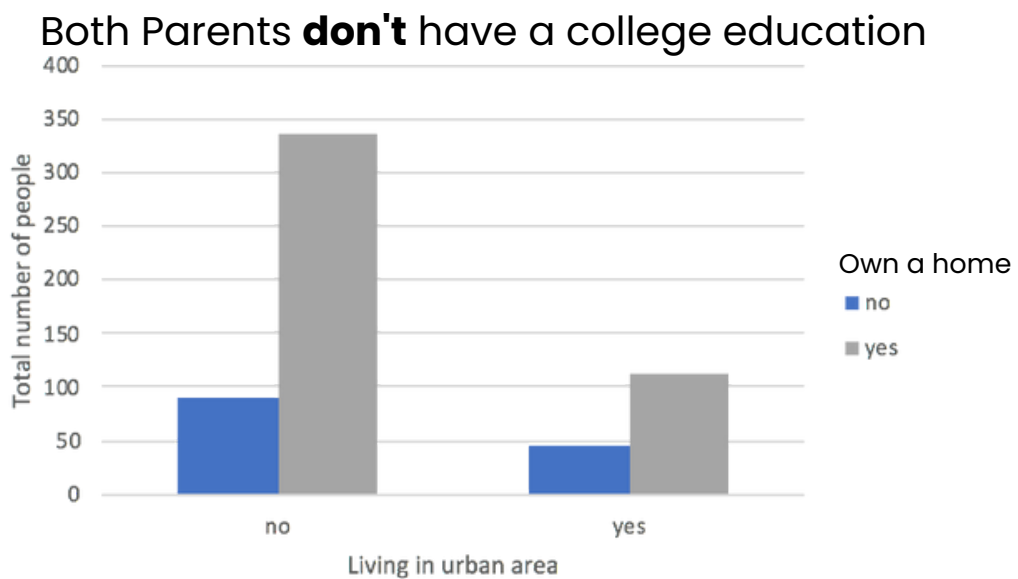
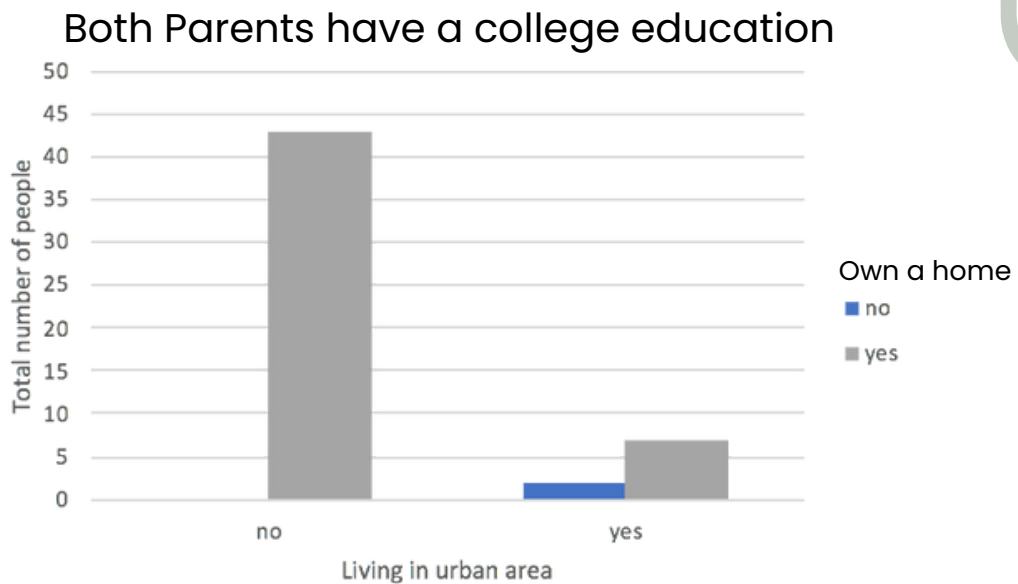


Figure 6: The average wage for the different years of education in the different regions.

Intriguingly, there are no people whose both parents have a college degree and don't own a home in a non-urban area. The majority of people whose both parents have a college degree own homes in non-urban areas. However, there are more people who own homes in non-urban areas whose parents don't have degrees. It seems that living in an urban area isn't sought after as it could be too expensive.

Insights

SELECT

```
id,  
avg_county_tuition,  
academic_score,  
education,  
region
```

FROM

```
reports_student_colleges
```

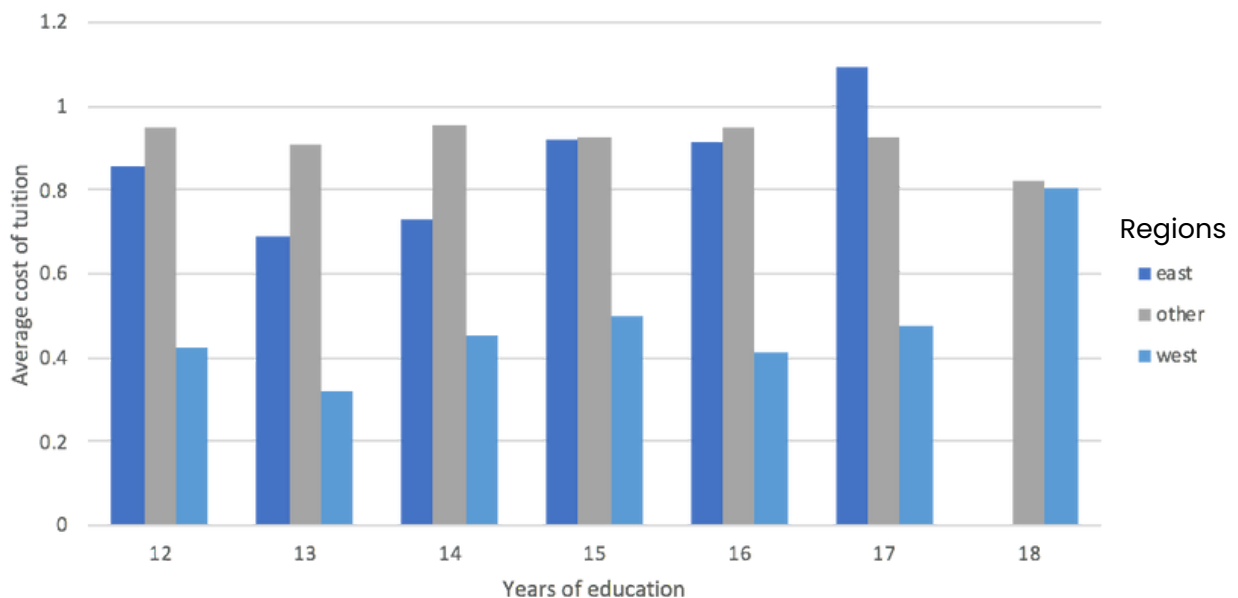


Figure 7: The average tuition for counties amongst the different regions.

The average tuition costs in 1000 USDs over the 2 regions east, west and other. You can clearly see in figure 6 that the average tuition cost is the cheapest in the west.

Findings

There are 5 questions we aimed to find in this analysis:

1. What are the trends for academic scores over the years of education for the different regions?
2. What is the average wage over the years of education for the different regions?
3. Does education and income have an influence over whether people own houses or not?
4. Does parents having a college degree play a role in whether they own a house in an urban area?
5. Do different regions have a significant difference in the average amount of tuition?

In figure 1 and table 1 we can see that there are no people from the East with 18 years of education. The academic score for the 3 regions are fairly similar except for year 13 and year 18.

It was found that the average wage is usually higher in the "Other" region in all years of education. Year 16 the East has the higher average wage and for 18 years of study, the West having the highest average wage.

Education does not play the predicted role of owning a home. It is seen in figure 3 that the most people who own homes are people with 12 years of education.

This is followed up by looking at income (low and high) and whether this has any significance on owning a home. Figure 4 shows that people with a low income own their homes more than people with a high income.

Accompanying this train of thought, I wanted to see if parents' education had any weight. The expected result of parents with a college degree owning homes in urban areas was not met and it was found that most people (parents with and without college degrees) prefer homes in non-urban areas.

Lastly, I decided to see if there was any difference between region in regards to average tuition. It was found that the west is significantly lower in average tuition.

75%

**of people don't own homes
in urban areas**

0

**people from the East have
18 years of education**

Conclusion

Summary

Years of education does not play a role in owning a home, in the average wage, in living in urban areas. Parents having a college degree does not play a role in this either. More analysis needs to be done.

What I've learnt:

SQL is a wonderful tool for data management and access. I enjoyed this task and look forward to more.



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