# DATA ANALYST: SQL PORTFOLIO

Prepared by

Adil Raheem

Professional Background

I am a junior data analyst with more than one year of industry experience. I am currently an engineering undergraduate student at Obafemi Awolowo University. I interned at Side Hustle in the first quarter of 2022 as a data analyst, making impressive improvements and completing various capstone projects.

I am proficient in using the tableau software for visualisation and I have successfully completed personal projects which are all publicly displayed on my tableau dashboard. I used my spreadsheet skills to carry out a project on analysing player data for a local football league, helping them derive insights from a sorted and organized player statistics. I am continually improving my skillsets and currently taking advanced courses in SQL and the art of visualisations with EntryLevel. Below is my progress timeline chart.
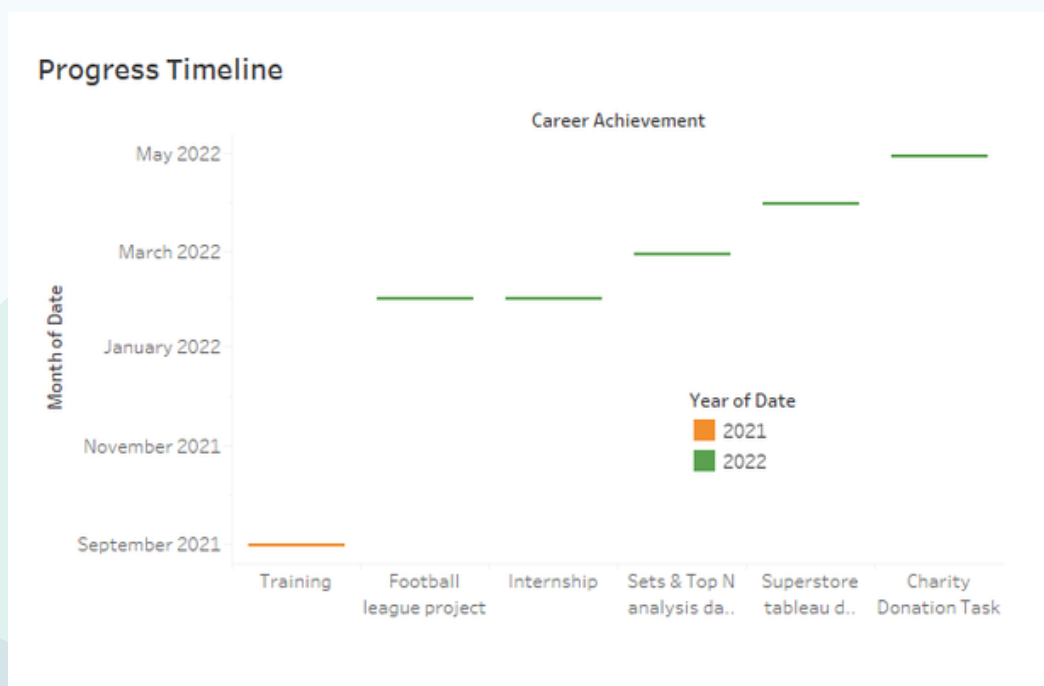
This portfolio is for a charity, Education for All. Having previously worked on a non-profit organization's project and possessing the required skillsets of using spreadsheets, extracting insights from large datasets using SQL, performing ETL (Extract, Transform and Load) processes and creating interactive dashboards using Tableau, I am fit to carry out this task.

Portfolio Outline

Introduction

This portfolio presents insights from a charity donation data and discusses the results obtained from the analysis with visualisations. It aims to solve the task of how the charity foundation can increase the number of donors in its database, the donation frequency of the donors and value of donations.

Situation: The foundation is still in need of increasing its donation rates and number of donors to be able to meets its goal of 'Education for All'.

Task: To present data insights on donors, donation frequency and donation rates that can help in taking steps that will increase total donation.

Actions: I studied the datasets to better understand the business problem and I made inference on what I see happening with my understanding of the problem. I developed my root cause analysis using the 5 why's approach. With SQL codes, I understood the data better and looked for specific trends. I then visualised my discovered trends and insights using Tableau.

Results: I discovered that periodic donors (weekly and monthly donors) with 96.7% of the total donation brought in most of the total donation value even though one-time donors (once and yearly donors) had more donors. In addition, some regions of the country were drastically under-represented, having a very small number of donors. The root cause analysis points out that the charity representatives in these regions were fewer than in other parts of the country. I also discovered that the charity fundraising representatives didn't target or approach more of the prospective groups in terms of high-value donations. These groups include luxury car owners who make up just 16.2% of the donors and Marketing and Support workers who turned in with high average donations even with a lower number of donors when compared with every other job field except Legal.

My findings revealed that focusing more on the less represented groups, the under-represented regions, and encouraging periodic donations, especially with new donors will all increase donation rates donation frequency, and the number of donors.

Root Cause Analysis

Root cause analysis (RCA) is the process of discovering the root causes of problems in order to identify appropriate solutions. RCA assumes that it is much more effective to systematically prevent and solve for underlying issues rather than just treating ad hoc symptoms and putting out fires.

The process involved thinking out of the box and not focusing only on the bigger picture of increasing donations with the data given. I looked at how the fault might have come from the the fundraising team's end. The process prompted many questions to be asked and answers to be deliberated upon. The process finally drilled down to these 5 why questions.

Q: Why do we need to increase donations?
A: The initial round of donations couldn't satisfy the need of everyone in the charity foundation's database which doesn't serve the goal 'Education for all'

Q: Why was the donation not enough?
A: The ratio of people in need (in the foundation's database) is drastically more than the number of donors

Q: Why is there a large ratio margin?
A: We didn't get enough donors

Q: Why didn't we get enough donors?
A: There was very low turnout of donors from many states in some regions of the country.

Q: Why were there very few donors from these region?
A: Our representatives in these regions were very few compared to the other parts of the country.

Insights

Note: All visualisations are in terms of total donation

Based on Gender


```
1  SELECT gender, SUM(total_donation), AVG(total_donation) AS AVERAGE_DONATION
2  FROM Charitydatasettotaldonation
3  GROUP BY gender
4
```

gender	SUM(total_donation)	AVERAGE_DONATION
Female	2046806	4029.1456692913384
Male	1875511	3812.0142276422766

Visualisation

Female
2,046,806

Male
1,875,511

Based on Donor State

SQL Codes


```sql
1  SELECT state, SUM(total_donation) AS OVERALL_DONATION, AVG(total_donation) AS AVERAGE_DONATION
2  FROM Charitydatasettotaldonation
3  GROUP BY state
4  ORDER BY OVERALL_DONATION DESC
5
```

state	OVERALL_DONATION	AVERAGE_DONATION
California	427004	3778.7964601769913
Texas	343931	3620.3263157894735
Florida	329885	3665.3888888888887
New York	291048	5018.068965517241
Tennessee	172146	5738.2
Virginia	155020	3974.871794871795
Illinois	142780	4199.411764705882
Georgia	125386	3799.5757575757575
Colorado	120830	5492.272727272727

Visualisation
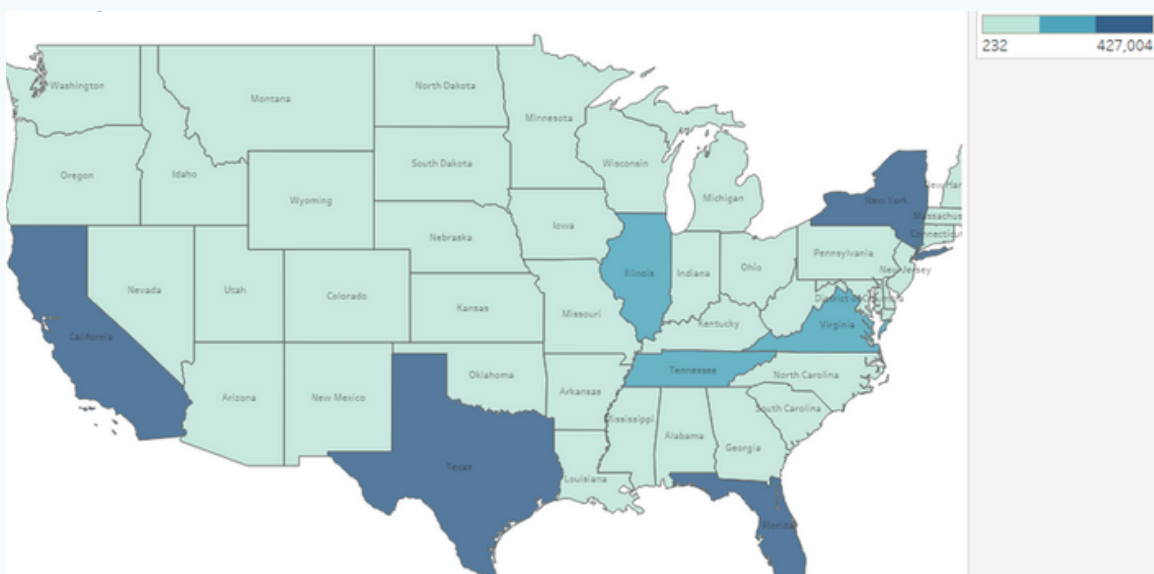
Based on Donation Frequency

SQL Codes

```
1  SELECT *,
2  CASE WHEN donation_frequency = "Once" THEN donation* 1
3  WHEN donation_frequency = "Weekly" THEN donation* 52
4  WHEN donation_frequency = "Monthly" THEN donation* 12
5  WHEN donation_frequency= "Yearly" THEN donation*1
6  END AS total_donation
7  FROM Donation_Data
8  JOIN Donor_Data2
9  ON Donation_Data.id = Donor_Data2.id
```

id	first...	last_...	email	gender	job_...	don...	state	shirt...	don...	univ...	car	seco...	favo...	movi...	total_donation
1	Nefen	Roger...	nroge...	Male	Huma...	28	Color...	3XL	Weekly	McSp...	GMC	NULL	Teal	Come...	1456
2	Kippar	Saffin	ksaffi...	Male	Huma...	292	Califo...	2XL	Once	Ferrelli	Chrysler	Pashto	Green	Drama	292
3	Panc...	Crichley	pcrich...	Female	Engin...	178	Califo...	XL	Monthly	Rags...	Ford	NULL	Yellow	Come...	2136
4	Skippy	McTavy	smcta...	Male	Sales	304	Illinois	S	Monthly	NULL	GMC	NULL	Puce	Actio...	3648
5	Trudie	Codner	tcodn...	Male	Busin...	219	Florida	M	Weekly	Spitell	Suzuki	Swati	Purple	Child...	11388

```
1  SELECT COUNT(*), donation_frequency, SUM(total_donation) AS OVERALL_DONATION, AVG(total_donation) AS AV
2  FROM Charitydatasettotaldonation
3  GROUP BY donation_frequency
```

COUNT(*)	donation_frequency	OVERALL_DONATION	AVERAGE_DONATION
232	Monthly	716160	3086.896551724138
264	Once	64586	244.6439393939394
245	Weekly	3075904	12554.710204081633
259	Yearly	65667	253.54054054054055

Visualisation

Based on Car Used

SQL Codes

Car_group	count	OVERALL_DONATION
Middle-Class Cars	777	2878825
Luxury cars	156	754528
Luxury Cars	6	5201

Visualisation
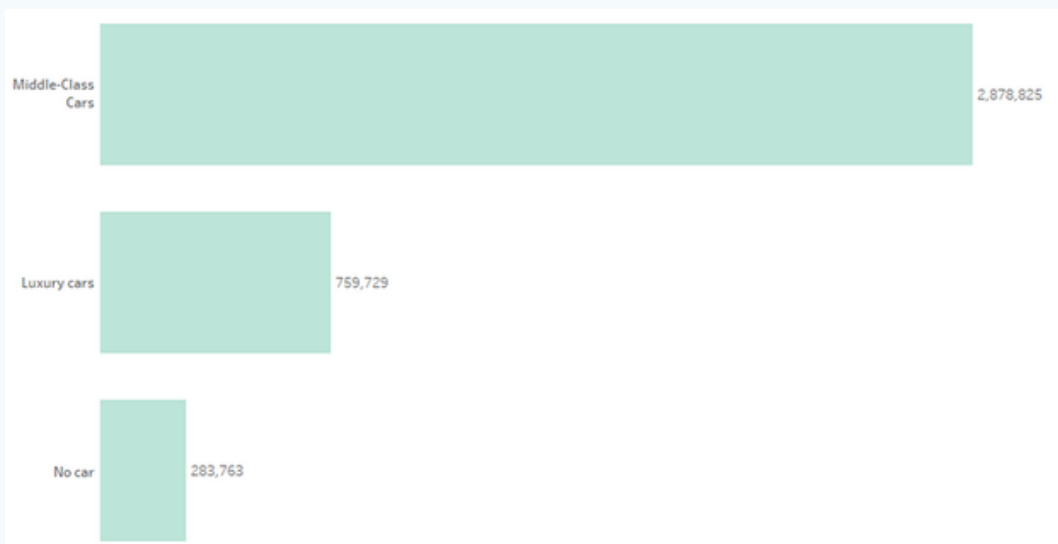
Based on Job Field

SQL codes
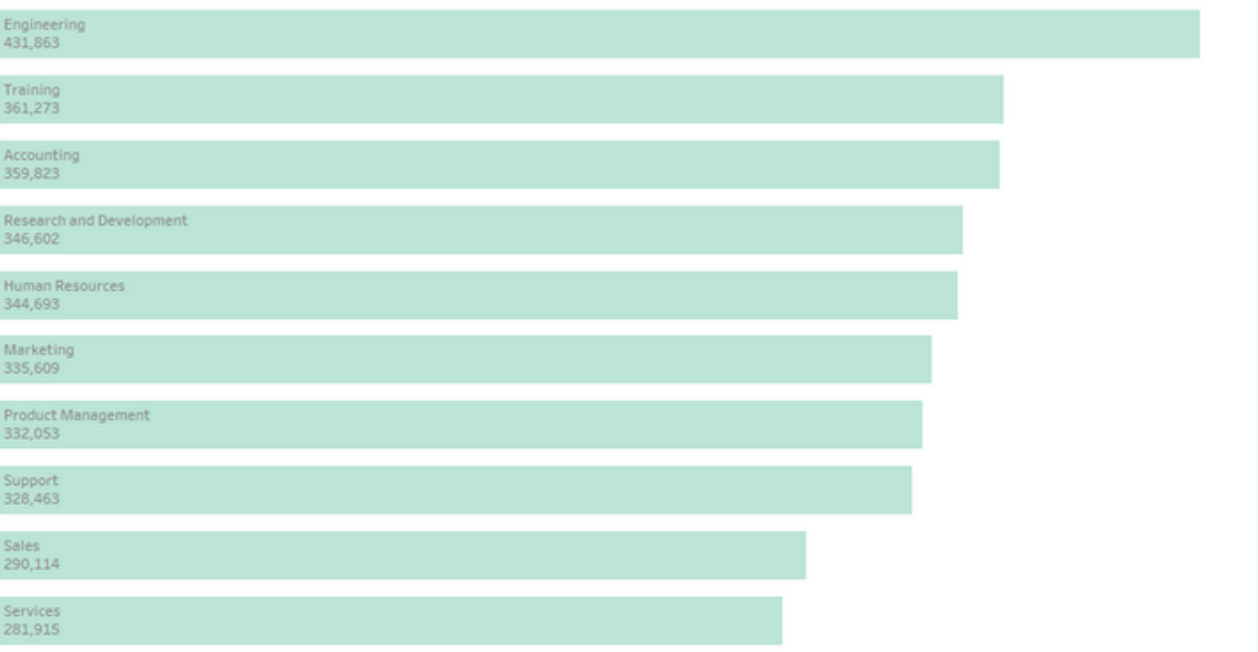
1. Ordered by total donation

```
1  SELECT job_field, SUM(total_donation), AVG(total_donation)
2  FROM Charitydatasettotaldonation
3  GROUP BY job_field
4  ORDER BY SUM(total_donation)
```

job_field	SUM(total_donation)	AVG(total_donation)
Legal	234334	3550.5151515151515
Business Development	275575	2931.648936170213
Services	281915	3523.9375
Sales	290114	3495.3493975903616
Support	328463	4157.7594936708865
Product Management	332053	3689.4777777777776
Marketing	335609	4535.256756756757
Human Resources	344693	3706.3763440860216
Research and Development	346602	4126.214285714285
Accounting	359823	4497.7875
Training	361273	4300.869047619048

2. Ordered by average donation per job field

```
1  SELECT job_field, state, SUM(total_donation), AVG(total_donation)
2  FROM Charitydatasettotaldonation
3  GROUP BY 1, 2
4  ORDER BY 3 DESC
```

job_field	state	SUM(total_donation)	AVG(total_donation)
Human Resources	California	74283	3909.6315789473683
Research and Development	California	70780	7078
Support	California	66731	6066.454545454545
Training	Illinois	61136	8733.714285714286
Training	Florida	57122	7140.25
Engineering	California	55514	5046.727272727273
Support	New York	53924	13481
Marketing	Florida	52501	8750.166666666666
Business Development	Florida	51596	3968.923076923077
Research and Development	Virginia	50587	7226.714285714285

Visualisation

Department	Value
Engineering	431,863
Training	361,273
Accounting	359,823
Research and Development	346,602
Human Resources	344,693
Marketing	335,609
Product Management	332,053
Support	328,463
Sales	290,114
Services	281,915

Findings and Recommendations

Findings based on gender

The findings based on gender showed that there were more female donors than there were male donors but the male donors had a higher total donations, indicating that the male donors donated more on average than their female counterpart. I recommend getting in more male donors to the match number of female donors or even exceed it.

Findings based on donor state

California, Texas, and Florida were the top 3 states by total donations and number of donors. The map shows that most states in the Midwest and Northeast region of the country had an insignificant number of donors and total donations value. I recommend posting more representatives to these regions to increase engagement with people in that region which will, in turn, increase the value of donations and the number of donors.

Findings based on Donation frequency

Weekly donors had the highest total donations while one-time donors had the least total donations of the four donation frequencies. The same trend was repeated in terms of average donations. Weekly donors with an average donation of 12,555 were followed far behind by monthly donors with an average donation value of 3,807.

It was found that people who donated in intervals throughout the year greatly donated more. I recommend encouraging other donors to opt for periodic donations instead of a one-time donation. This can be achievable by setting up favourable donation packages for periodic donation frequencies (i.e. weekly and monthly donations). These packages should be targeted at one-time donors and yearly donors. This will help them have a plan for their donation and be more intentional about it.

Findings based on car used

Grouping the cars used by the donors into two classes was helpful in deriving valuable insights. Donors with null in their car column were treated as donors that don't own a car i.e. No Car

The cars were grouped into luxury cars and middle-class cars. The luxury cars were group based on cars that are recognised by society to be high-class expensive vehicles. The cars categorised under luxury cars were: Aston Martin, BMW, Bugatti, Cadillac, Ferrari, Jaguar, Lotus, Lexus, Land Rover, Lamborghini, Maserati, Mercedes-Benz, Porsche, and Rolls-Royce. The other 37 car brands were categorised under middle-class vehicles.

Donors who owned middle-class cars had by far the higher total donation of the three groups, this can be attributed to them having the higher number of donors with 775 donors, Luxury car owners had just 164 donors and 61 donors were not car owners. However, on average, luxury car owners had a higher donation rate with a value of 4690 per donor slightly edging out donors that own a car with an average value of 4652. Middle-class donors had an average donation value of 3705.

I recommend increasing the approach towards luxury car owners for donations as this would effectively increase both values of donations and the number of donors.

Findings based on job field

The top 5 donors based on job field were Engineering, Training, Accounting, Research and Development, and Human Resources. This shows us that people working in the technical-related fields were seen to donate more than those from other types of job fields. It can be said that this trend is due to the fact that most of these top job fields are familiar with and workaround using money to help a cause or develop something.

Out of the top 5 job fields (in terms of total donations), only Human Resources had its average donation value below the general average donation value of 3,992. In addition to the other four job fields in the top 5 (Engineering, Training, Accounting, and Research and Development), the Support job field and Marketing job field also have their average donation value above the general average donation value.

An interesting finding is that Marketing and Support are two of the bottom 3 job fields in terms of the number of donors. This shows that Support and Marketing workers are likely to donate more in value than others if they were being represented more.

I recommend increasing the approach towards the top donors by job field to bring in more value from those job fields and also focus on engaging more Marketing and Support workers on the possibility of donating to the charity.

Conclusion

I discovered through my analysis various ways to attain the desired objective of increasing donors and the value of donations. Firstly, targeting the right set of people, as discovered from the insights will increase donation rates and the number of donors. For instance, in terms of job fields, people working in the technical-related fields such as Research & Development, and Engineering were seen to donate more than those from other job fields. Also, the Marketing and Support job fields were two of the six job fields with above-average donation value even though they had a lower number of donors when compared with other job fields, this shows they only need to be represented more to bring in more donation value. Some regions had a very low or insignificant turnout of donors, these parts of the country should be equipped with more fundraising representatives in order to increase engagement with potential donors and effectively increase the number of donors. Groups with higher donation value who happen to be underrepresented, for example, people who drive luxury cars, should also be focused on and increasingly approached for donations. The foundation should increase the number of representatives that will take on these under-represented groups and regions for effective results. Periodic donations were found to generate more donation value. As 96% of donors were already donating periodically, the focus should be on new donors. A structured periodic donation package should be created to guide new potential donors.

Although the stated points above and in the recommendations are the most effective ways as derived from the insights, the team must also not become too one-sided by focusing only on the underrepresented group as this may cause loss of donors from the initially represented groups due to a lack of engagement with them.

Therefore, approaching the right set of people and hiring more representatives in general who are interested in non-profit works to be able to rightfully account for both represented and underrepresented groups will bolster the number of people being approached and sensitised about donating towards the charity. This will increase donors, the value of donation rates, and also the frequency of donations altogether.

It is pertinent to note that having just 1000 donors is too small for a charity foundation that is established in a country with a population of about 330 million people and a 60.1% employment-population ratio as of May 2022. This indicates that increasing the number of donors in the foundation's database is very important in increasing donation value and this can be achieved by having a wider reach, making the recommendation of increasing the number of the charity foundation's representatives a right move towards attaining the foundation's desired goal.

Contact details

Email: adilraheemrao@gmail.com

LinkedIn: https://www.linkedin.com/in/adilraheem

Tableau dashboard:
https://public.tableau.com/app/profile/adil7998#!/?
newProfile=&activeTab=0