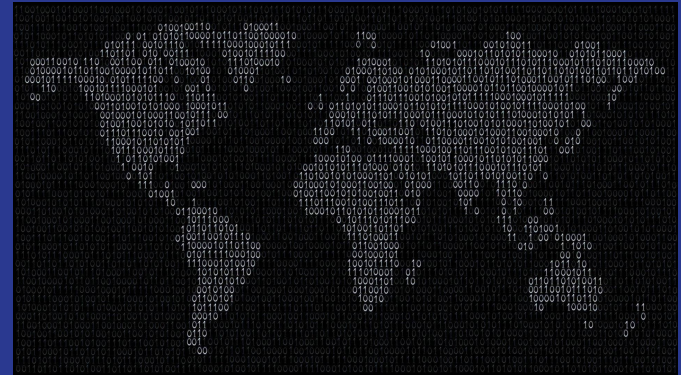# OESON Learning Data Science:

Jobs and Salaries - A Python and Tableau Analysis

Performed by Thomas Saraceno

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Prompt

- Extract meaningful insight from a dataset through data analysis and chart creation

- The dataset is a listing of jobs from a job portal with various job designations and related salaries from across the world

- Provide greater understanding of the job requirements in term of salaries across different levels of work experience and other categorical measures

Dataset Parameters

- There are 9355 jobs within the dataset
- Jobs are listed with the following categorical and numerical measures:
    - Work Year - the year in which the data was recorded
    - Job Title - The specific title of the job role
    - Job Category - A classification of the job role into a broader category
    - Salary Currency - The currency in which the salary is paid
    - Salary - The annual gross salary of the role in the local currency
    - Salary in USD - the annual gross salary converted to United States Dollars (USD)
    - Employee Residence - The country of residence of the employee
    - Experience Level - Classifies the professional experience of the employee
    - Employment Type - The type of employment (such as full-time, part-time)
    - Work Setting - The work setting (such as remote, in-person)
    - Company Location - The country where the company is located
    - Company Size - The size of the employer company

Dataset Parameters (continued)


```
df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9355 entries, 0 to 9354
Data columns (total 12 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   work_year          9355 non-null   int64
 1   job_title          9355 non-null   object
 2   job_category       9355 non-null   object
 3   salary_currency    9355 non-null   object
 4   salary             9355 non-null   int64
 5   salary_in_usd      9355 non-null   int64
 6   employee_residence 9355 non-null   object
 7   experience_level   9355 non-null   object
 8   employment_type    9355 non-null   object
 9   work_setting       9355 non-null   object
 10  company_location   9355 non-null   object
 11  company_size       9355 non-null   object
dtypes: int64(3), object(9)
memory usage: 877.2+ KB
```

The images here show some basic inferences about the dataset derived using the Python programming tool

The left shows the total amount of information listed in each column category.

The right shows a quantity of each job based on "Job Title" (top) and "Job Category" (bottom)

```
[ ] df["job_title"].value_counts()

job_title
Data Engineer                    2195
Data Scientist                   1989
Data Analyst                     1388
Machine Learning Engineer         991
Applied Scientist                 272
                                  ...
Consultant Data Engineer            1
Sales Data Analyst                  1
Managing Director Data Science      1
AWS Data Architect                  1
Deep Learning Researcher            1
Name: count, Length: 125, dtype: int64
```

```
[ ] df["job_category"].value_counts()

job_category
Data Science and Research       3014
Data Engineering                2260
Data Analysis                   1457
Machine Learning and AI         1428
Leadership and Management        503
BI and Visualization             313
Data Architecture and Modeling   259
Data Management and Strategy      61
Data Quality and Operations       55
Cloud and Database                 5
Name: count, dtype: int64
```

Employment Type Pie Chart

Percentage of Jobs Available by Employment Type

0.203%
0.16%
0.118%
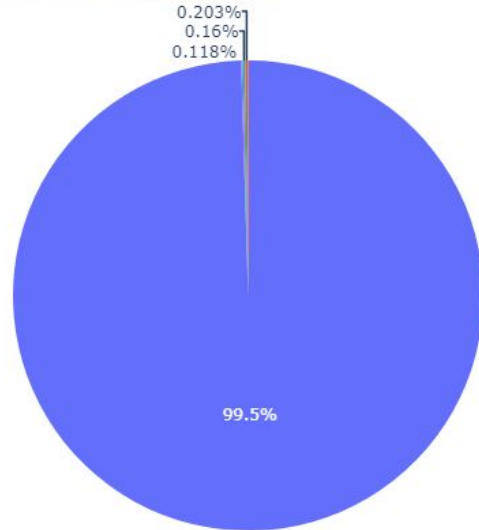
Full-time
Contract
Part-time
Freelance

99.5%

This chart shows the quantity of jobs in the list based on Employment Type. One can gather that nearly all of the jobs are "Full-Time", which has an effect on the salary structure of that job

Experience Level Pie Chart

Number of Jobs Available, Categorized by Experience Level [Pie Chart]
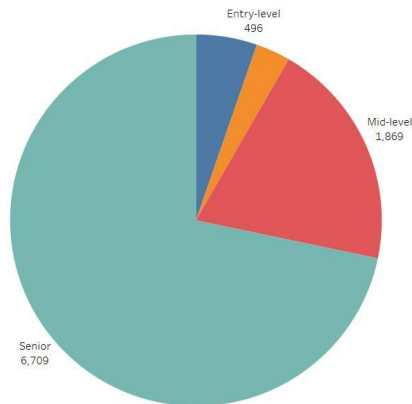
9,355

Experience Level
- Entry-level
- Executive
- Mid-level
- Senior

Entry-level
496

Mid-level
1,869

Senior
6,709

This chart shows the quantity of jobs based on Experience Level. About ¾ of the jobs are of "Senior" experience, indicating a certain level of expertise seen within the field

Experience Level and count of Project 2.csv. Color shows details about Experience Level. Size shows count of Project 2.csv. The marks are labeled by Experience Level and count of Project 2.csv.

Job Category Pie Chart

Number of Jobs Available in each Job Category [Pie Chart]
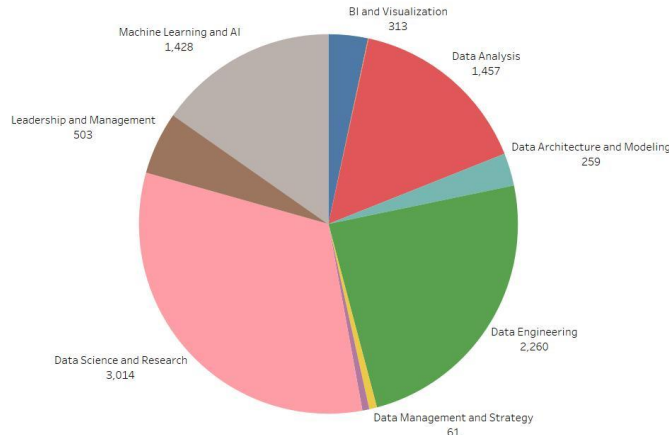
Job Category
- BI and Visualization
- Cloud and Database
- Data Analysis
- Data Architecture and Modeling
- Data Engineering
- Data Management and Strategy
- Data Quality and Operations
- Data Science and Research
- Leadership and Management
- Machine Learning and AI

This chart shows the quantity of jobs by Job Category, showing the occurrence of positions in each branch of work

Job Category and count of Project 2.csv. Color shows details about Job Category. The marks are labeled by Job Category and count of Project 2.csv.

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Job Category by Work Setting Pie Chart

Occurence of Jobs by Category According to Work Setting
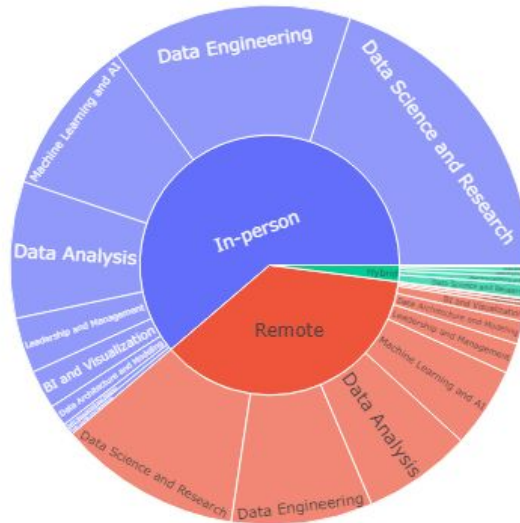
This chart shows the quantity of jobs in each Job Category based on the hierarchical status of Work Setting. One can gather that more of the jobs are "In-Person" and "Remote", and that categories such as "Data Science and Research", and "Data Engineering" occur more frequently

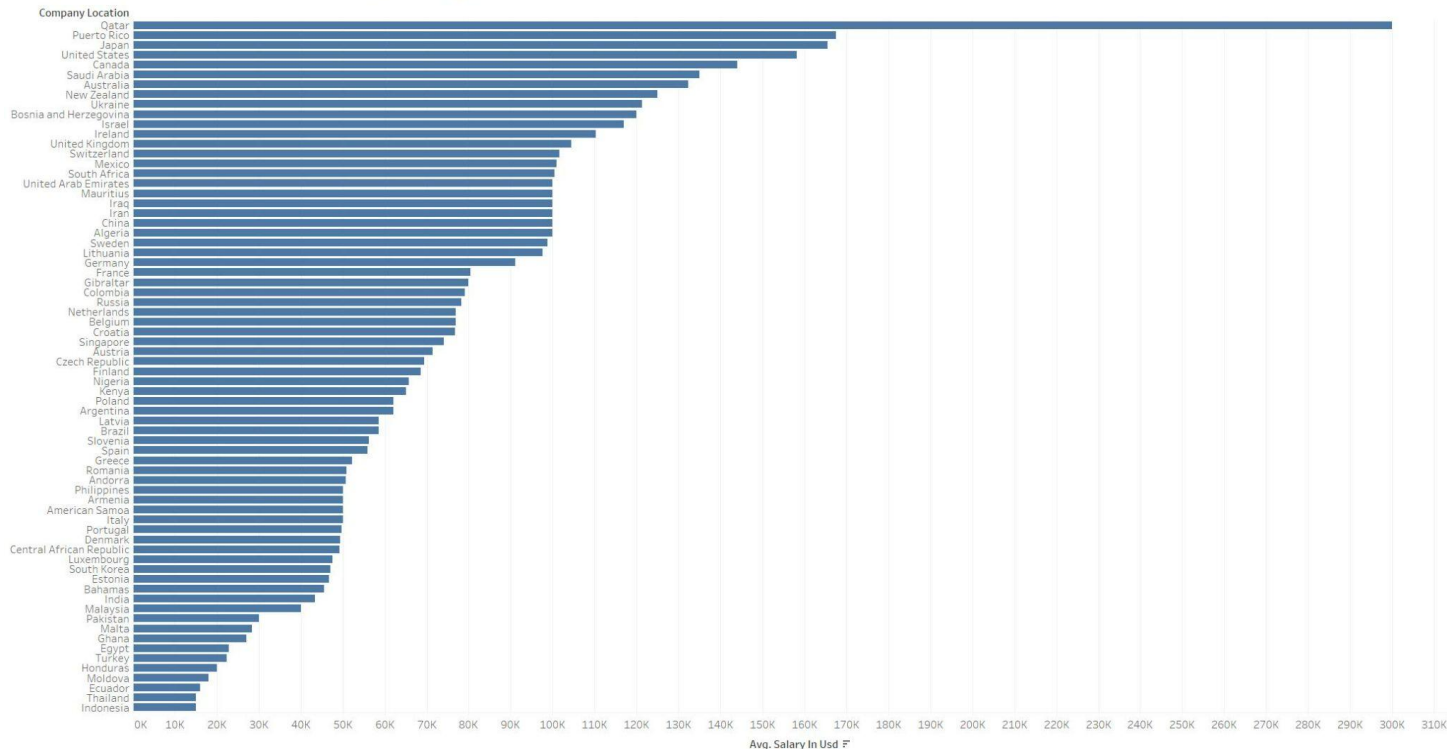# Average Salary [USD] by Company Location Map

Geographic Distribution of Jobs by Company Location, Highlighted by Average Salary [USD] [Map]
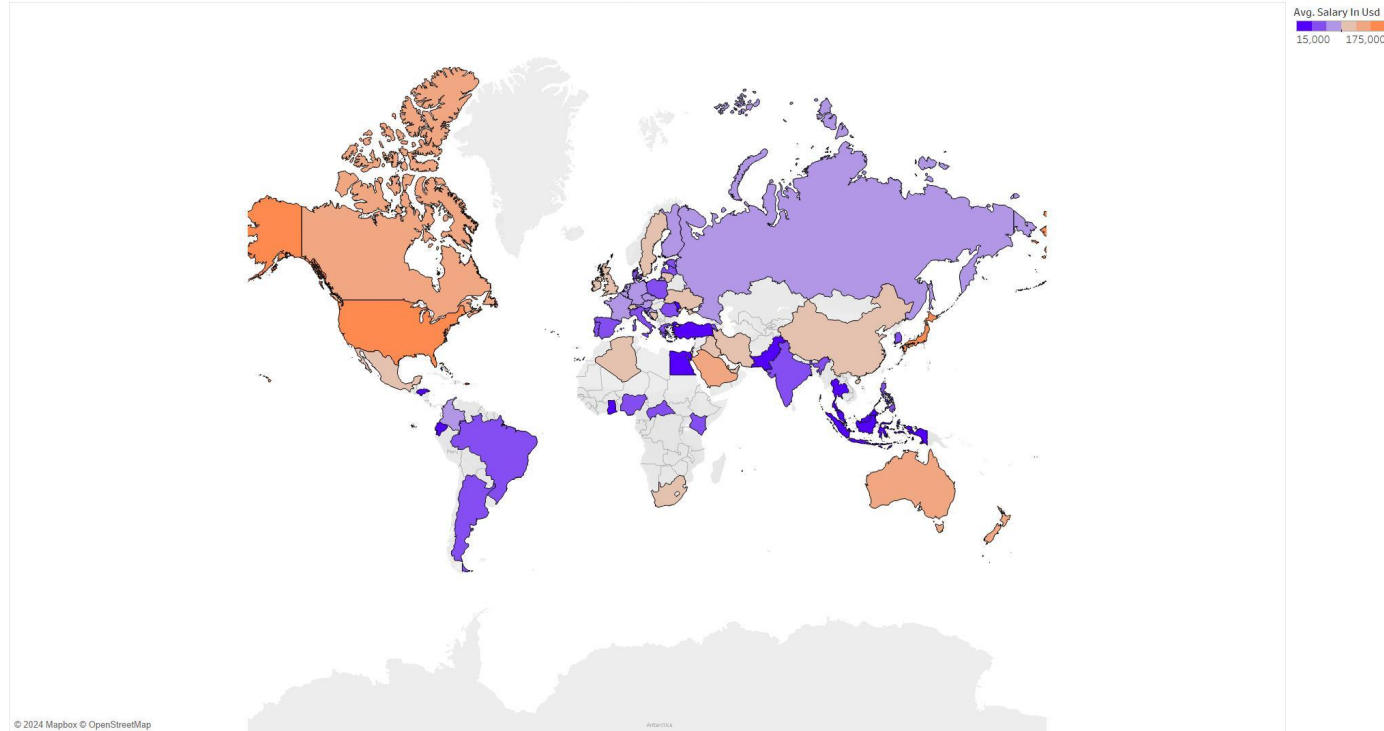
This map shows the Average Salary [USD] of jobs based on Company Location. Visualized is the salary range across the world, from greatest (orange) to least (purple)

Avg. Salary In Usd
15,000   175,000

© 2024 Mapbox © OpenStreetMap

Map based on Longitude (generated) and Latitude (generated). Color shows average of Salary In Usd. Details are shown for Company Location.

Average Salary [USD] by Company Location Bar Chart

Jobs per Company Location, ordered by Average Salary [USD] [Bar Chart]

This graph shows an alternative visualization of the highest to lowest Average Salary [USD] of each job by Company Location

Average of Salary In Usd for each Company Location.

Average Salary [USD] of Job Categories by Experience Level Treemap

Average Salary [USD] for each Job Category by Level of Experience

All				
Machine Learning and AI			**Data Engineering**	
Executive 206,510.4615	Mid-level 141,944.5957		Executive 187,123.2736	Mid-level 115,030.6584
Senior 191,544.4489	Entry-level 89,076.39063		Senior 156,001.7766	Entry-level 96,347.66316

This map represents the Average Salary [USD] of each Job Category, broken down by Experience Level. The size of each box indicated the relative size of the salary, with larger boxes equating to a higher salary. It is useful to visualize the average salary size of each category, and which experience level indicates a higher or lower salary value

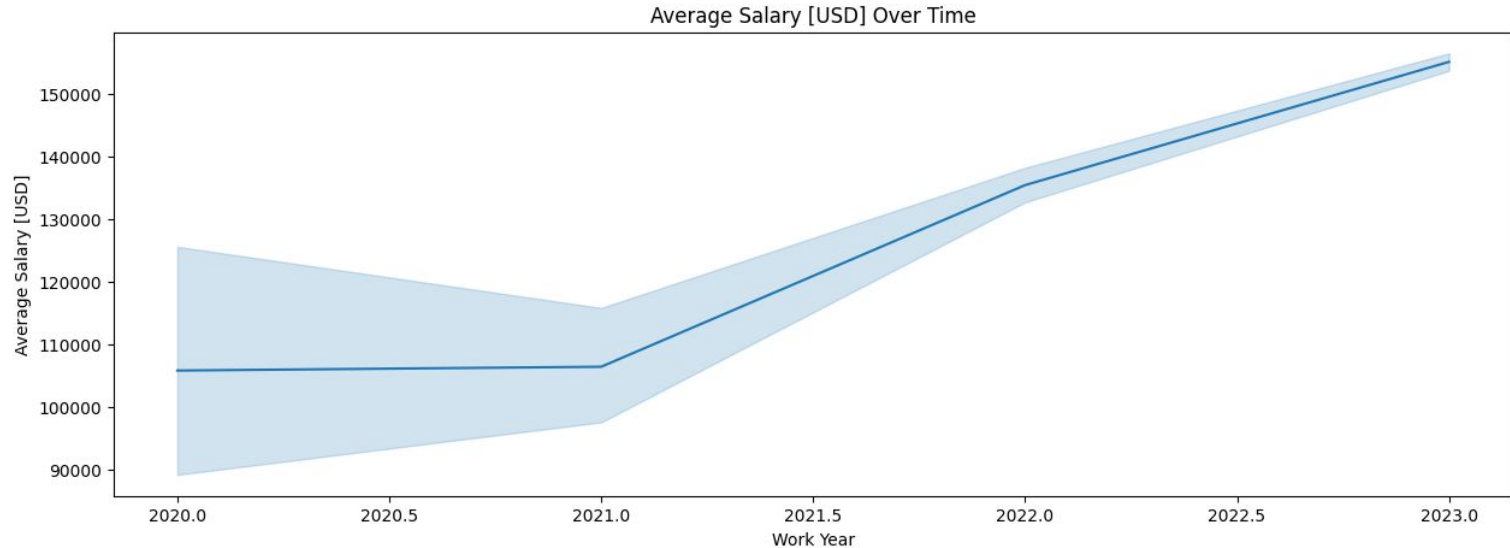# Average Salary [USD] of each Job Title Treemap

Hierachy of Average Salary [USD] of each Job Title [Treemap]

Avg. Salary In Usd
45,000 — 399,880

This map shows the the hierarchy of Average Salary [USD] of each Job Title. The larger the box is indicative of a greater salary. One can gather the salary distribution across various specialized roles

Job Title and average of Salary In Usd. Color shows average of Salary In Usd. Size shows average of Salary In Usd. The marks are labeled by Job Title and average of Salary In Usd.
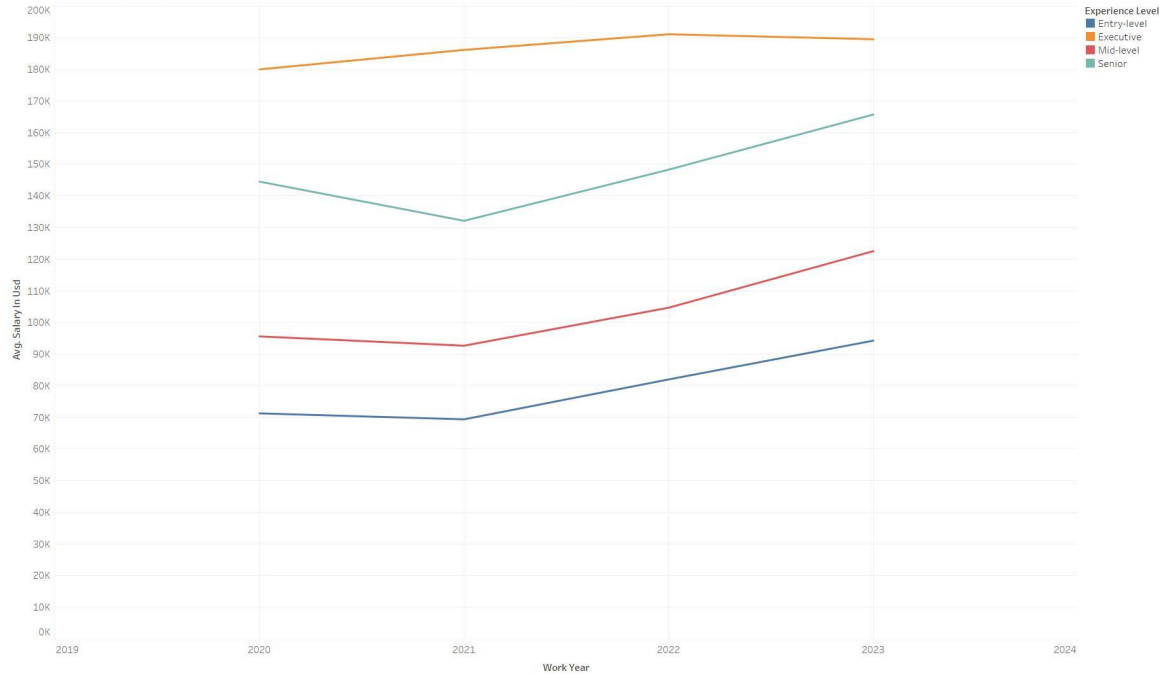
Average Salary [USD] by Work Year Line Plot

This plot shows the Average Salary [USD] of the jobs over each year the data was collected. One can visualize the salary trends over time

Average Salary [USD] of Experience Level by Work Year Line Plot

Average Salary [USD] of each Job based on Experience Level, by Work Year [Line Plot]
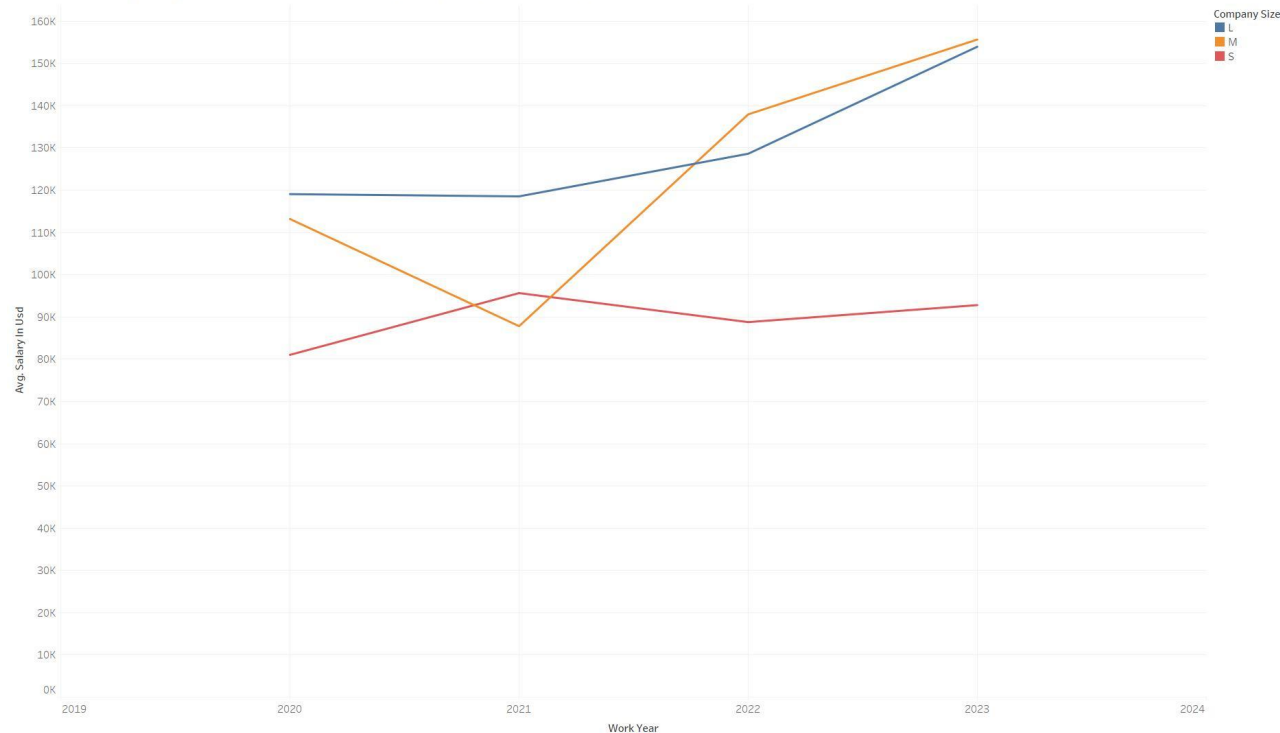

The trend of average of Salary In Usd for Work Year. Color shows details about Experience Level.

This plot shows the Average Salary [USD] of each job based on Experience Level, over each year the data was collected. One can see the difference in salary value for each experience level, as well as their trend over time

# Average Salary [USD] of Company Size by Work Year Line Plot

Average Salary [USD] of each Job based on Company Size, by Work Year [Line Plot]

This plot shows the Average Salary [USD] of each job based on Company Size, over each year the data was collected. One can see the difference in salary value based on company size, as well as the trend over time

The trend of average of Salary In Usd for Work Year. Color shows details about Company Size.

Distribution of Jobs by Average Salary [USD] Stacked Bar Chart

Distribution of Jobs by Average Salary [USD], Highlighted by Work Year [Stacked Bar Chart]
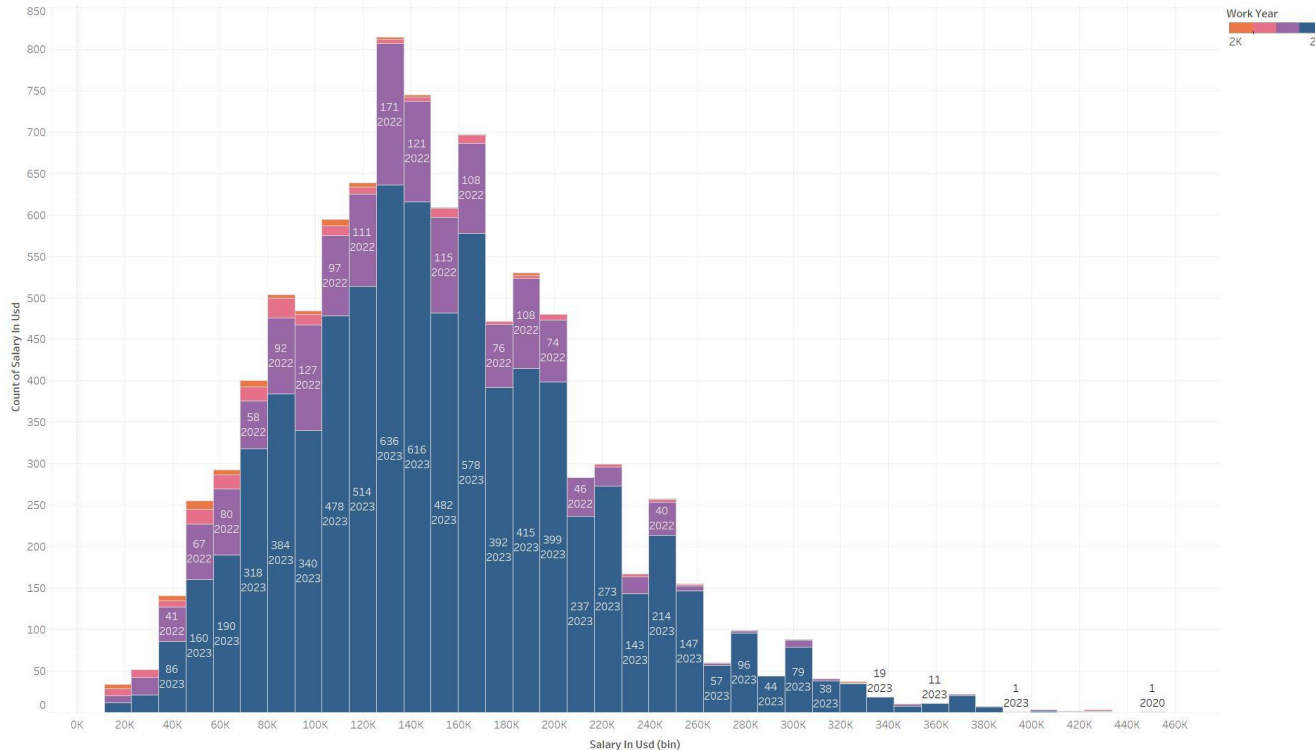
The chart shows the distribution of jobs by Average Salary [USD], with each work year highlighted by color. It shows more of the jobs occur in 2022 and 2023, and is useful to assess what salary values tend to occur most frequently in the field

Average Salary [USD] by Job Category Bar Chart

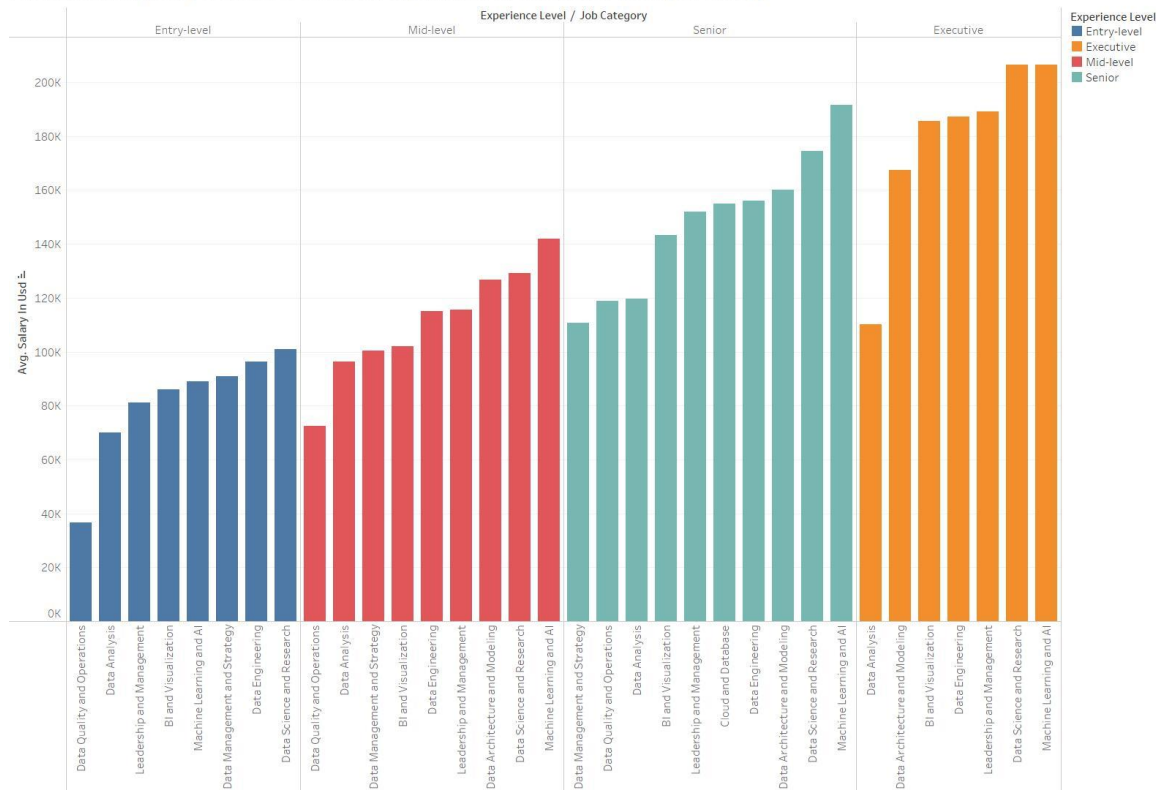Average Salary [USD] per Job Category [Bar Chart]
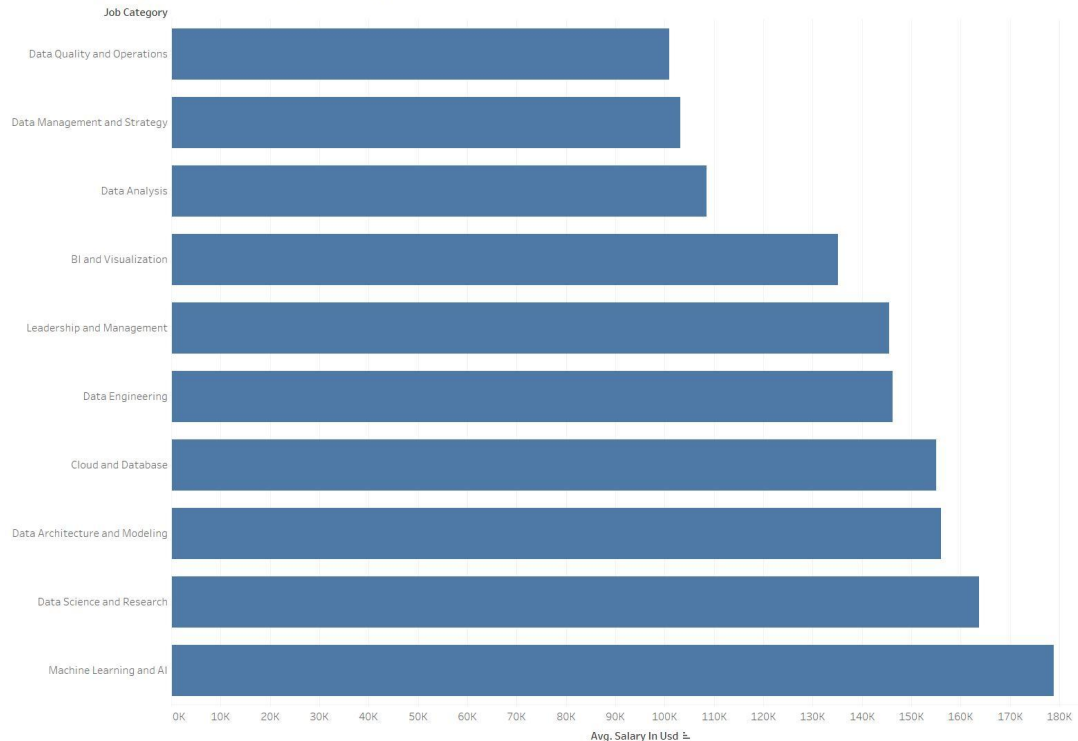
Average of Salary In Usd for each Job Category.

This chart shows the Average Salary [USD] of jobs based on each Job Category. It is useful to understand which field indicates a higher or lower salary value, with "Machine Learning and AI" as the highest, and "Data Quality and Operations" as the lowest

Average Salary [USD] by Job Category and Experience Level Bar Chart

Average Salary [USD] of each Job Category, Highlighted by Experience Level [Bar Chart]

Average of Salary In Usd for each Job Category broken down by Experience Level. Color shows details about Experience Level.

The chart shows the Average Salary [USD] of each Job Category, with Experience Level highlighted. It is useful to visualize which level of experience corresponds to a higher or lower salary in each category, as well as which categories may or may not have job positions due to the level of experience

Average Salary [USD] by Work Setting, Employment Type, and Experience Level Bar Chart

Average Salary [USD] of Jobs based on Work Setting and Employment Type, Highlighted by Experience Level [Bar Chart]
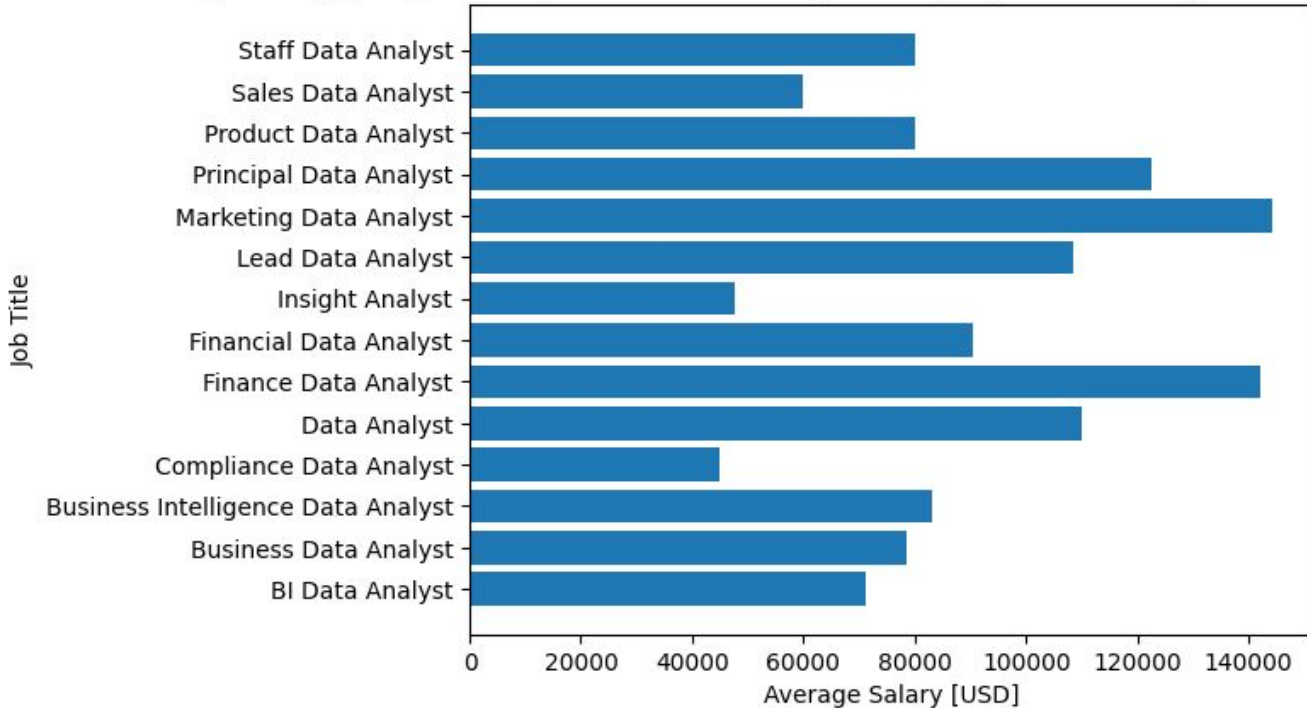
This chart shows the Average Salary [USD] of jobs based on Work Setting, Employment Type, and Experience Level. It visualizes which experience levels generate higher or lower salary based on the setting of work and employment type. Also shown is that there may or may not be job positions for every experience level, indicated in areas such as that shown in Hybrid-Contract work, where there is only Entry-level experience observed

Average of Salary In Usd for each Experience Level broken down by Employment Type vs. Work Setting. Color shows details about Experience Level. The marks are labeled by average of Salary In Usd.

Average Salary [USD] of Job Titles in Data Analysis Job Category Bar Chart

Average Salary [USD] of each Job Title Within the Job Category of Data Analysis

This chart visualizes the Average Salary [USD] of Job Titles within the Job Category of Data Analysis. It is useful to understand the salary distribution across these specialized roles

Salaries [USD] for the Job Title of Data Analyst Plot

Visualization of Salaries [USD] for the Job Title of Data Analyst
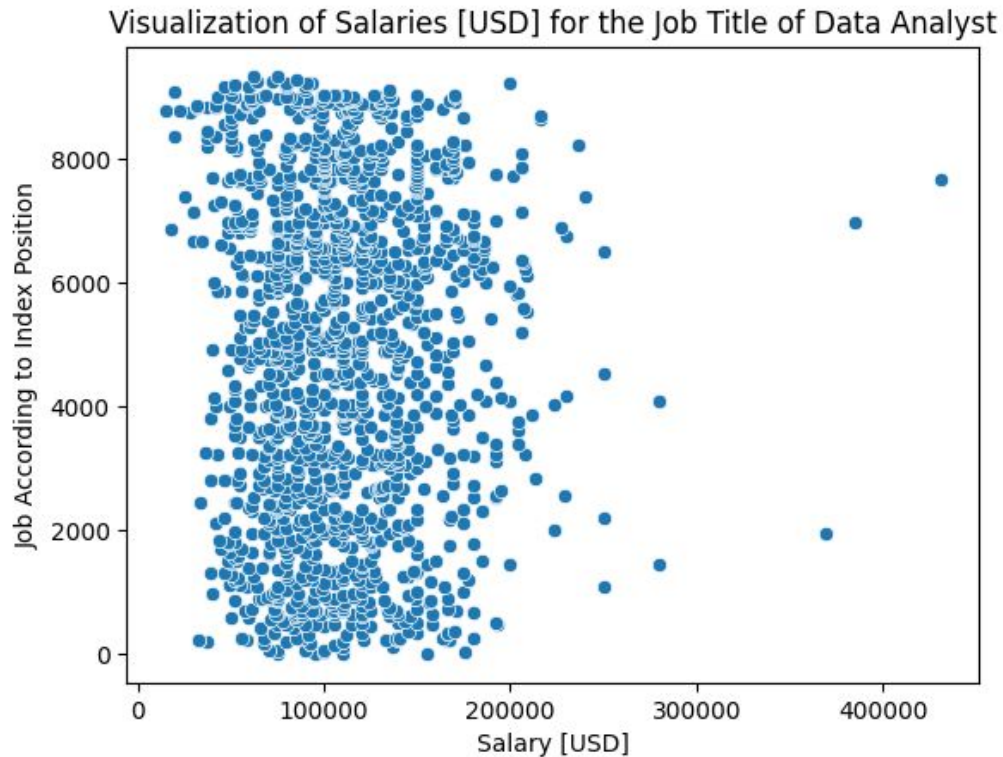
The plot shows each the Salary [USD] of each job position observed for the Job Title of Data Analyst, visualizing where most of salary values fall, and where there may be instances of positions with much greater or lower salaries. It is useful to visualize the distribution of salaries among this title

Salaries [USD] for the Job Title of Data Scientist, by Work Setting, Company Size, and Employment Type Plot

Visualization of Salaries [USD] for the Job Title of Data Scientist, Compared by Work Setting, Company Size, and Employment Type
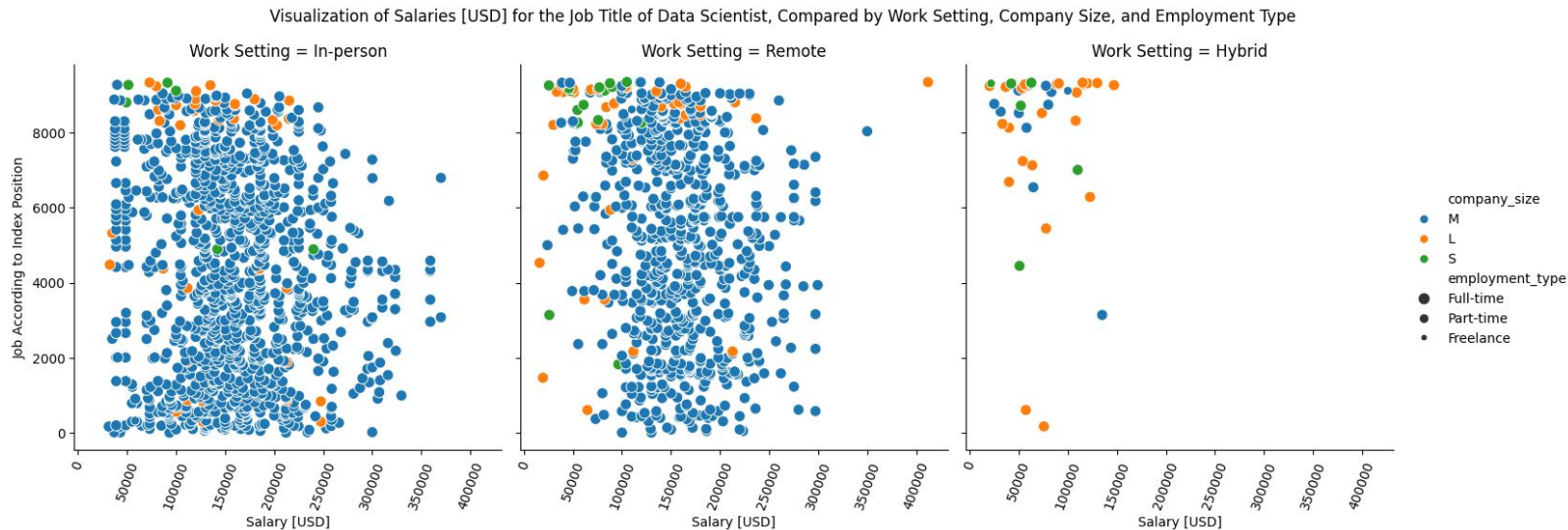
This plot shows the visualization of each Salary [USD] in the Job Title of Data Scientist, based on Work Setting, and highlighted by Company Size and Employment Type. It is helpful to visualize how many positions occur within each work setting, and the general distribution of salary values. One can also observe that most of the positions appear to be for full-time work at medium-size companies

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Average Salary [USD] of Job Categories by US and UK Residence Bar Chart

US and UK Employee Residence, Average Salary Comparison [USD], by Job Category
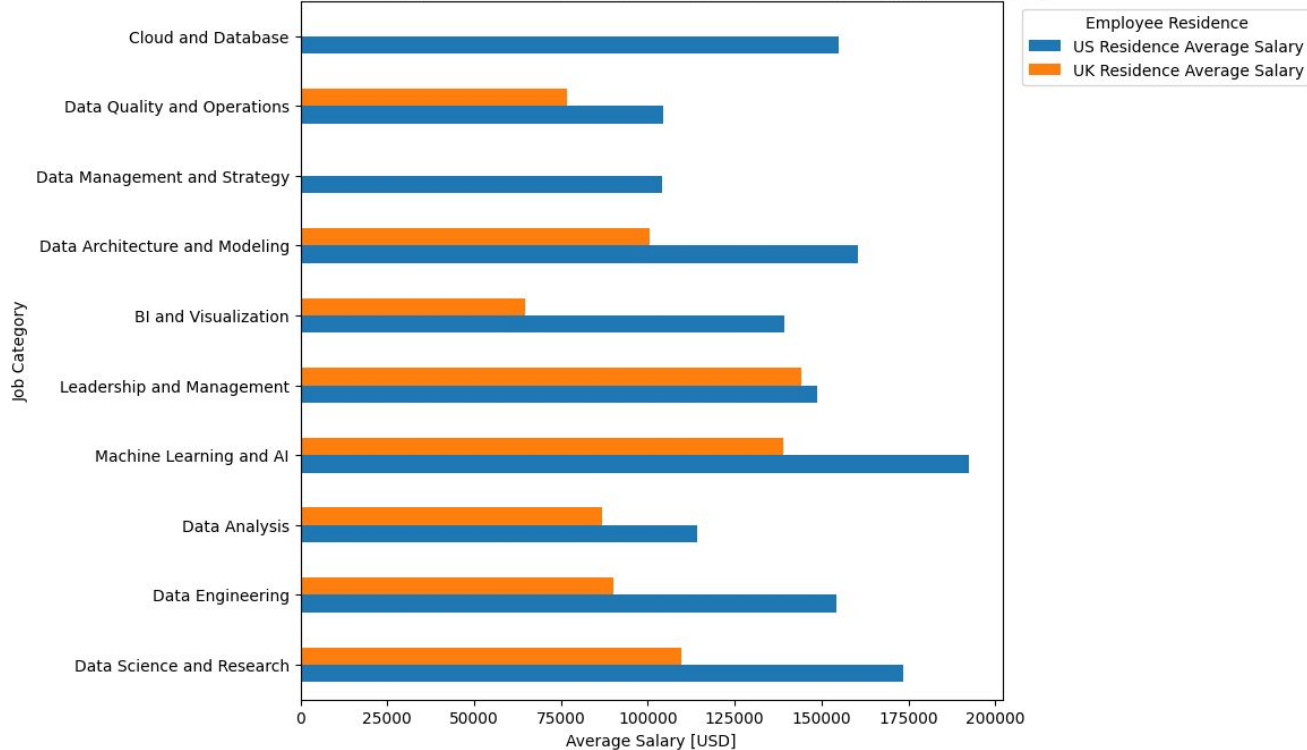
This chart compares the Average Salary [USD] of each Job Category within Employee Residence in the United States and in the United Kingdom. This is useful to comparing geographical salary differences

Average Salary [USD] of Job Titles by US and UK Residence Bar Chart

UK and US Employee Residence, Average Salary Comparison [USD], by Top 5 Corresponding Job Titles
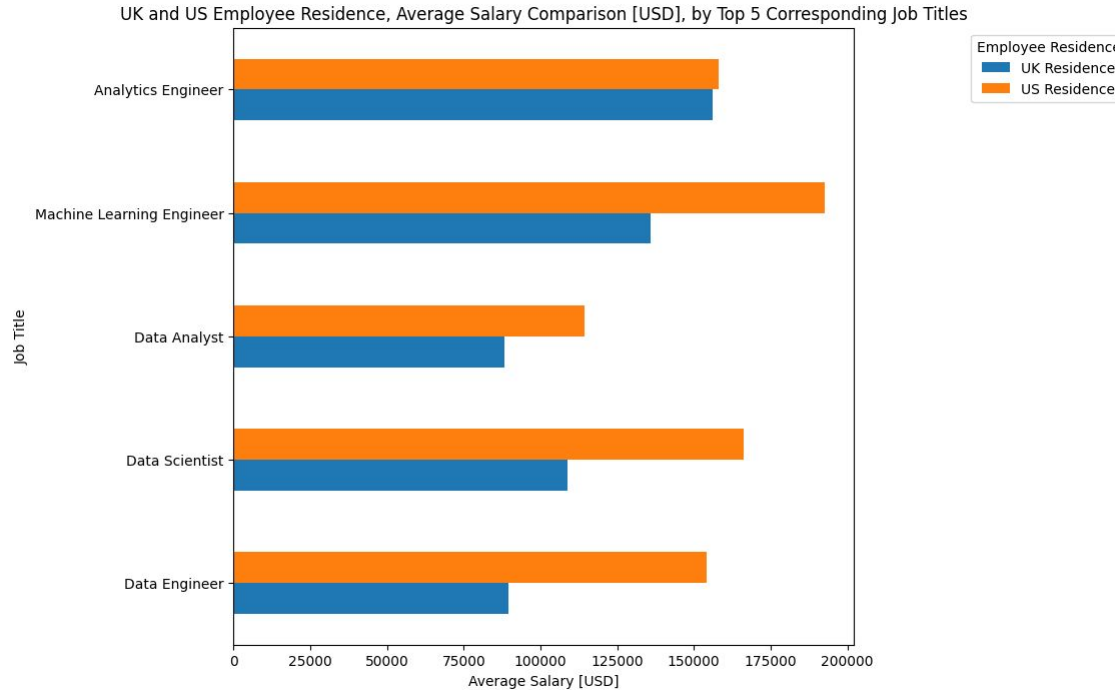
This graph shows the Average Salaries [USD] of the top 5 Job Titles related to Employee Residence in the United States and United Kingdom. This highlights another geographical distinction among salaries

Link to GitHub