PRIYANKA MITTAL
PORTFOLIO

ABOUT ME

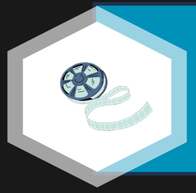
I am Priyanka, a proficient data analyst, passionately committed to delivering transformative solutions through data-driven insights. My specialty lies in identifying correlations within datasets, transforming complex challenges into viable opportunities, and prioritizing the best interests of all stakeholders involved.

My prior engagement in the automotive navigation sector equipped me with substantial experience in enhancing product features by comprehending trends and forecasting growth. My inquisitive nature ensures a relentless pursuit of understanding and bridging knowledge gaps.

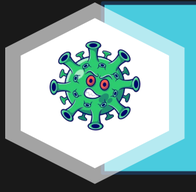
I am presently exploring opportunities in the data analysis field, aspiring to employ my expertise in scrutinizing extensive data sets. The goal is to deliver valuable insights on product feature trends that could steer business decisions towards a trajectory of success.

PROJECTS

1
Instacart Basket



2
Rockbuster Stealth



3
Preparing for Influenza Season

4
Pig E. Bank

5
GameCo

6
Chocolate Bar Rating

INSTACART BASKET

Uncover sales patterns to suggest customer segmentation strategies and advertisement scheduling

Instacart

Company

Instacart is an online grocery store that operates through an app; allowing customers to place grocery orders and have them delivered to their homes.

Context

Instacart has a variety of customers in their database with unique purchasing behaviors. They are considering targeted marketing and need a strategy to ensure customers are advertised appropriate products.

Problem Statement

We will perform initial and exploratory data analysis of company data in order to derive insights and create suggestions for better customer segmentation.

Instacart

Perform exploratory analysis to uncover information about sales patterns and suggest strategies for segmentation and advertisement

GOAL

- ✓ Determine **busiest days** of week and **hours of day** to assist in ad scheduling
- ✓ Segment products using simpler **price range groupings**
- ✓ Determine popular products and departments
- ✓ Determine **ordering behaviors** of different customer demographics and profiles

DATA

- ✓ The data used for this project included information about Instacart's **customers**, **departments**, **products**, **and orders.**
- ✓ The database was derived from The Instacart Online Grocery Shopping Dataset 2017, which can be accessed **here**
- ✓ A data dictionary can be found **here**

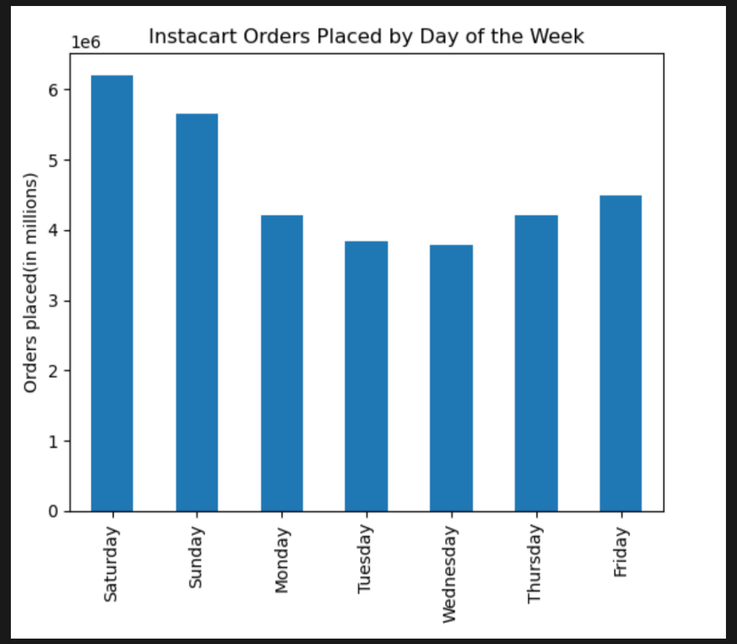
SKILLS > PYTHON

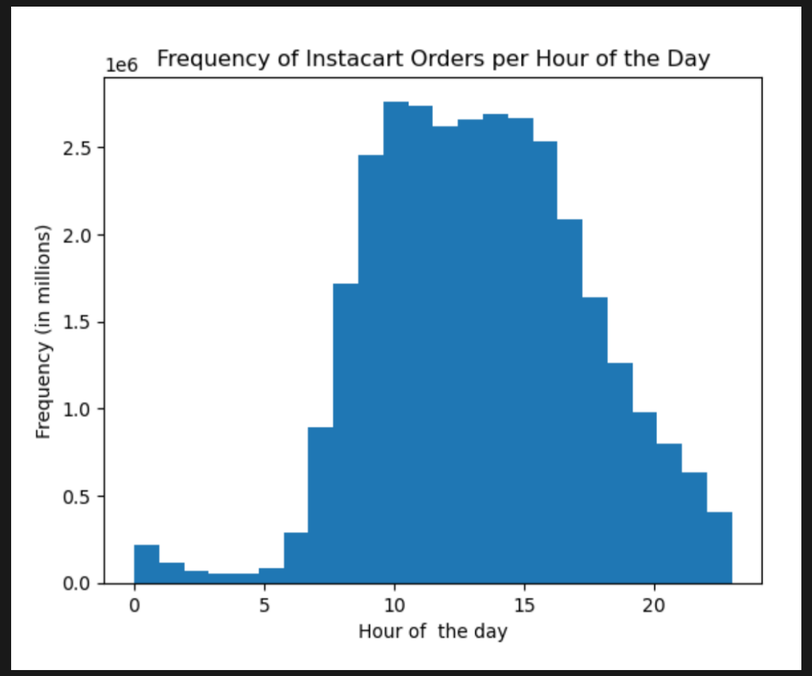
- ✓ Importing libraries, including **Pandas, Numpy, Matplotlib, and Seaborn**
- ✓ Conducting descriptive exploratory tasks
- ✓ Data wrangling and subsetting
- ✓ Conducting data consistency checks
- ✓ Combining and exporting data
- ✓ Deriving new variables using conditional logic
- ✓ Grouping and aggregating data
- ✓ Data visualization in Python

Link to Project Brief

Analysis: Busiest Times

The largest number of orders occur on the weekends, and Instacart receives the most orders between 10:00 AM to 3:00 PM

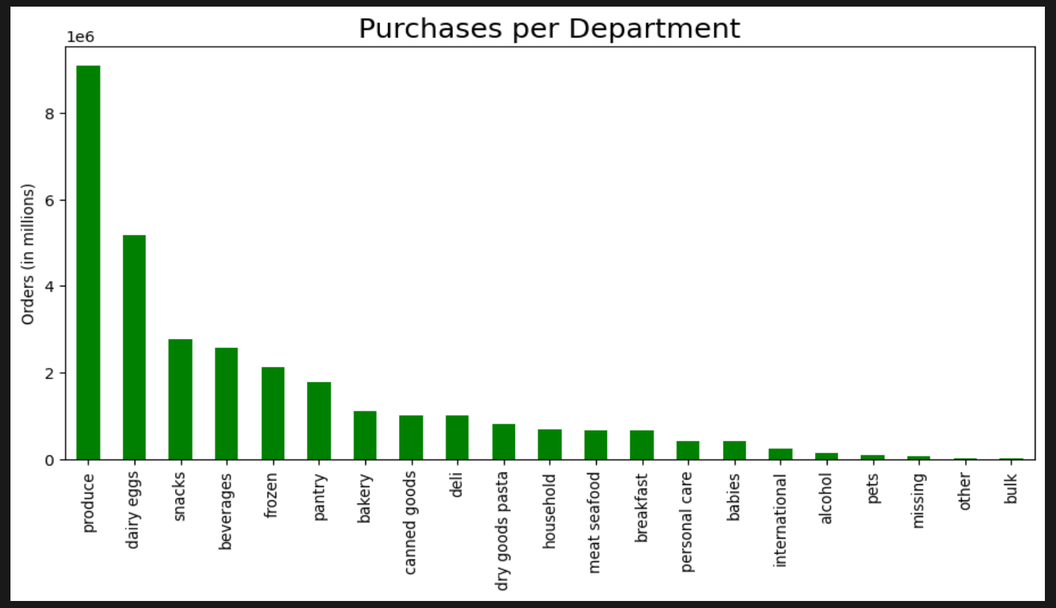




There is an **Advertising opportunity** which can be scheduled in mid-week before **9 am or after 6 pm**, in order to increase sales during this time.

Analysis: Department Popularity

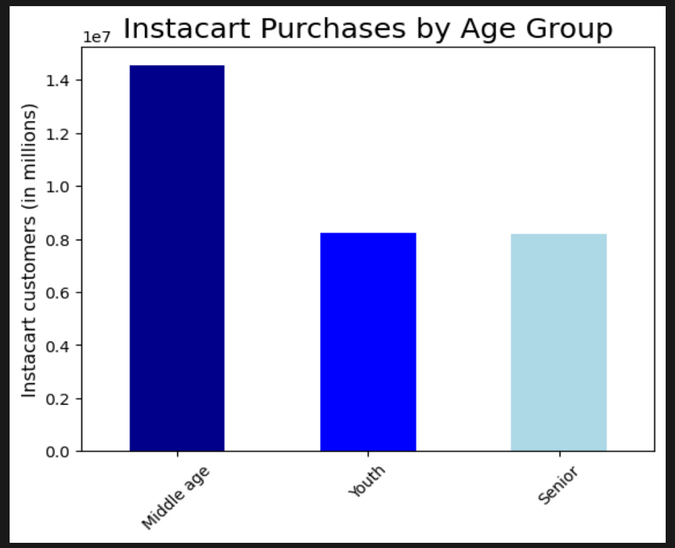
Produce, dairy/eggs, and snacks have the highest number of orders. However, alcohol, products from the babies department, and bulk products have the fewest number of days between orders, and users spend the most on meat/seafood, dairy/eggs, and bulk items.

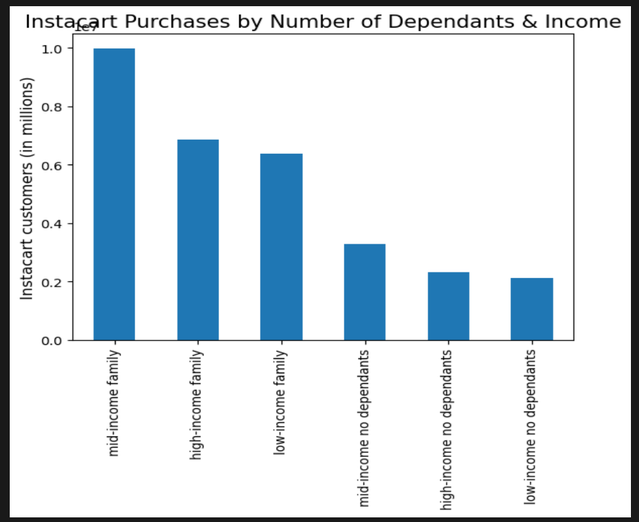


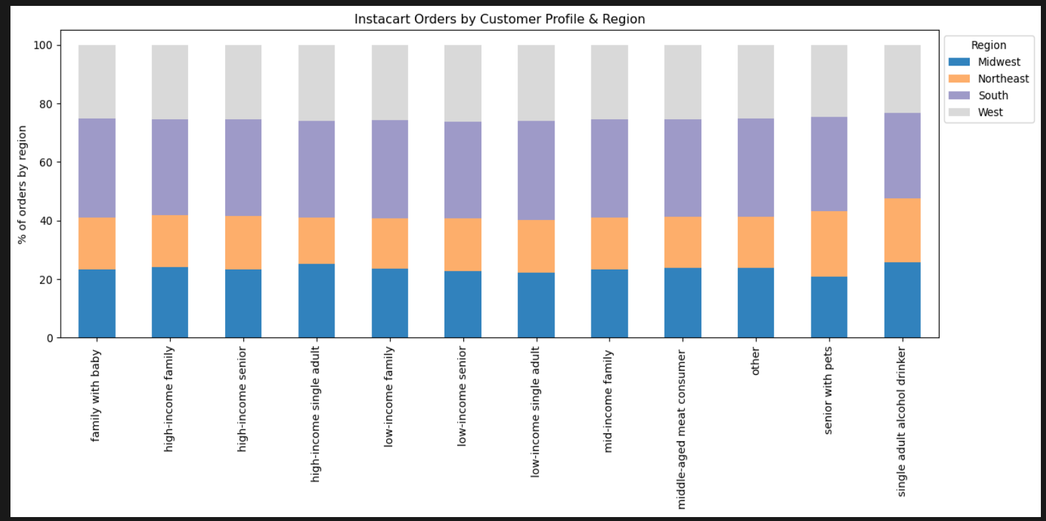
	Days Since Last Order			Prices			
department	min	max	mean	sum	min	max	mean
alcohol	0	30	9.332472	1179302.3	1	15	8.151446
babies	0	30	9.335526	3133096.4	1	15	7.634399
bakery	0	30	10.225862	8852224.6	1	15	7.868462
beverages	0	30	10.206104	19759202	1	15	7.682624
breakfast	0	30	10.389484	5470900.4	1	14.9	8.068044
bulk	0	30	9.451048	279212.8	1.4	14.1	8.346919
canned goods	0	30	10.672517	7637778.5	1	15	7.54666
dairy eggs	0	30	10.155419	43363062	1	15	8.352176
deli	0	30	10.431782	7813188.1	1	15	7.783347
dry goods pasta	0	30	10.770432	6042181.4	1	15	7.34937
frozen	0	30	10.740142	16431751	1	15	7.738627
household	0	30	10.968798	5164912	1	15	7.379943
international	0	30	10.316078	1965702.9	1	15	7.678797
meat seafood	0	30	10.505405	10999037	8	25	16.300062
missing	0	30	9.659415	560933.3	1	15	8.660655
other	0	30	10.056842	239569.2	1.1	15	6.961995
pantry	0	30	10.220274	14289861	1	20	8.01494
personal care	0	30	10.604785	3394733.1	1	15	7.998617
pets	0	30	10.93915	734083.7	1	15	7.88786
produce	0	30	10.026067	72455791	1	15	7.980349
snacks	0	30	10.108421	11827920	1.6	7	4.275555

Analysis: Customer Segmentation

Instacart's primary user group **is middle-aged, middle-income families**. This is consistent regionally.








```
In [19]:  # Create the 'age category' column

          df_2.loc[(df_2['age'] >= 18) & (df_2['age'] < 35), 'age_category'] = 'Youth'
          df_2.loc[(df_2['age'] >= 35) & (df_2['age'] < 65), 'age_category'] = 'Middle age'
          df_2.loc[df_2['age'] >= 65, 'age_category'] = 'Senior'
```

```
In [105…  # Compare customer profiles and regions

          crosstab_profile_region = pd.crosstab(df_2['customer_profile'], df_2['region'], dropna = False)
```

- ✓ By utilizing the loc function customers have been segmented into different categories based on age, household size, loyalty status, geographic region, and shopping habits to create profiles for targeted marketing.
- ✓ Crosstabs were created to look into the connection between variables.

Some of the key insights from the demographic grouping are:

- The majority of Instacart customers are middle-aged married people with at least one dependent
- Families of all income groups account for the majority of Instacart customers.
- Most customer profiles show similar ordering habits regarding price of orders, frequency of orders, and department preference. - There are no significant differences in ordering habits based on geographic region.

Recommendation for Instacart

01

Advertisement Schedule: to boost sales during lower traffic times, Instacart should schedule advertisements for Tuesdays and Wednesdays after 4:00 PM**.**

02

Product Popularity: because produce and dairy/eggs are already a part of most people's preferences, it is unlikely that they need to spend a lot of advertising dollars convincing people to purchase these. It may make more sense to increase advertisements of meat and seafood, where prices are higher and orders are not as high to attract more revenue.

03

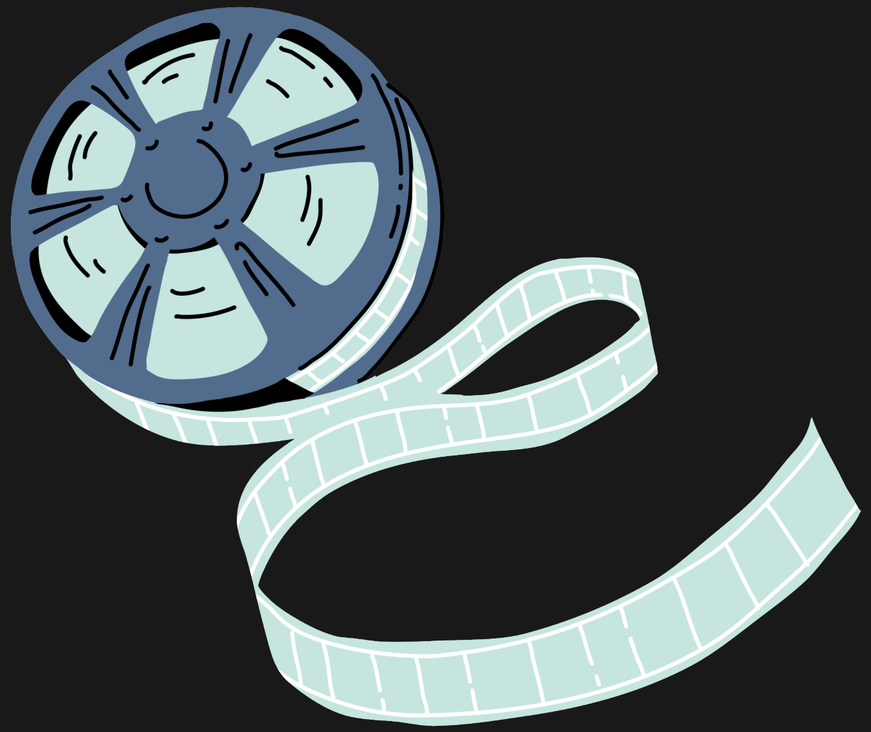
Customer Profiling: Instacart's largest customer base is middle-age, middle-income families. They should decide whether to target this group further and investigate preferred products and shopping times or choose to attempt to expand their customer base.

PROJECT DELIVERABLES

Click the icons to access the file

Project Python Scripts – Hosted on GitHub

Final Report



ROCKBUSTER STEALTH

Analyze database to develop competitive strategy recommendations against streaming services

Rockbuster Stealth

Company

Rockbuster LLC is a movie rental company that is wanting to transition to an online video rental service due to increasing competition from rival streaming services.

Context

The business intelligence department will work to create a launch strategy for the new online video rental service

Problem Statement

We will introduce data management systems and perform analysis in order to answer company questions regarding sales and customer demographics.

Rockbuster Stealth

Assist fictitious movie company Rockbuster Stealth in developing a strategy to remain competitive with online streaming services

GOAL

- ✓ Analyze descriptive statistics of movie rentals to determine patterns and trends
- ✓ Determine **customer loyalty**
- ✓ Investigate regional differences in customer numbers, sales and genre preferences
- ✓ Recommend strategies based on analysis

DATA

The data used for this project included information about Information provided by CareerFoundry that includes data on film inventory, customers, payments, and other information.

A complete data dictionary can be found **here**.

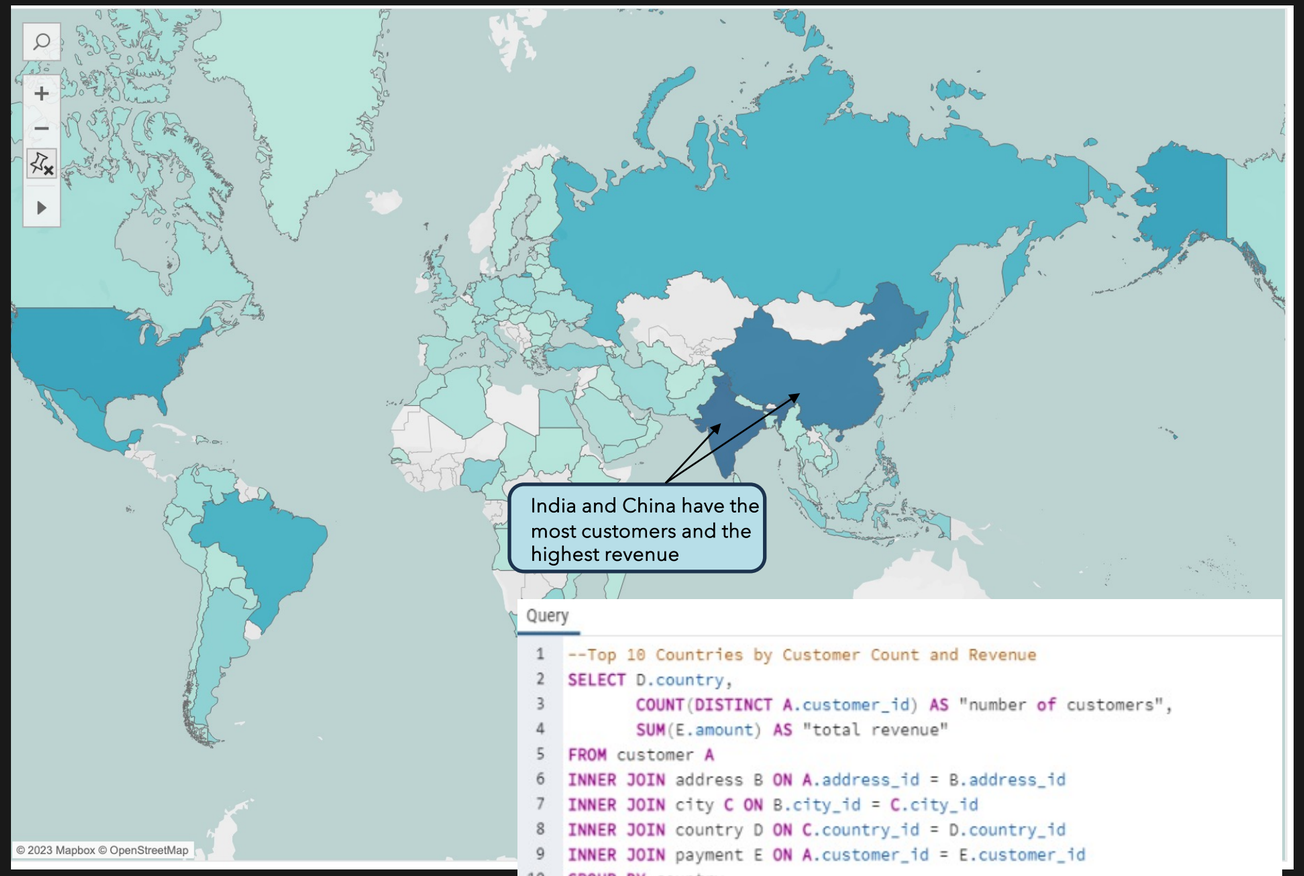
SKILLS > SQL

- ✓ Understand and utilize **relational databases**
- ✓ Query data in SQL by **ordering, limiting, and grouping data**
- ✓ Filter data using **WHERE** and **HAVING** clauses
- ✓ Identify and clean dirty data
- ✓ **Join** tables
- ✓ Perform **subqueries and Common Table Expressions**
- ✓ Present findings

Link to Project Brief

Analysis: Geographic Distribution of Customers

According to the data set, there are 599 customers across 108 countries, with the majority residing in Asia and the Pacific



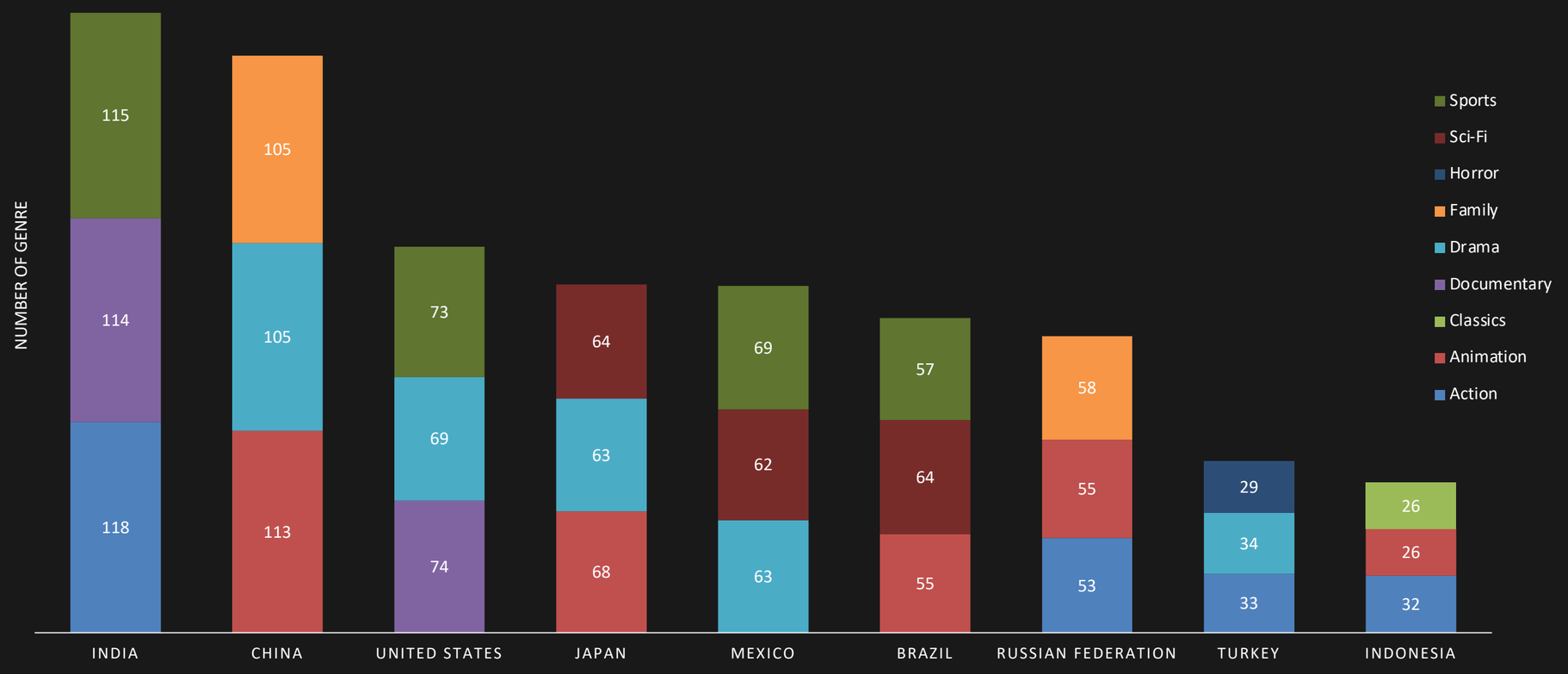
Query

```
--Top 10 Countries by Customer Count and Revenue
SELECT D.country,
       COUNT(DISTINCT A.customer_id) AS "number of customers",
       SUM(E.amount) AS "total revenue"
FROM customer A
INNER JOIN address B ON A.address_id = B.address_id
INNER JOIN city C ON B.city_id = C.city_id
INNER JOIN country D ON C.country_id = D.country_id
INNER JOIN payment E ON A.customer_id = E.customer_id
GROUP BY country
ORDER BY COUNT(DISTINCT A.customer_id) DESC
LIMIT 10
```

Top Coutries	Revenue
India	$6,035
China	$5,251
United States	$3,685
Japan	$3,123
Mexico	$2,985
Brazil	$2,919
Russia Federation	$2,766
Philippines	$2,220
Turkey	$1,498
Indonesia	$1,353

Analysis: Genre Preferences in Top 10 Countries

Each of the top 10 countries is unique in their go-to movie genres



While **Sports, Sci-Fi, Animation, Drama** and **Comedy** were the highest revenue generators overall, each country had their own preferences

Recommendation for Rockbuster Stealth

01 **Focus marketing strategy & budget on Asia:** Particularly in India, China and Japan where we already have large pools of customers and high spenders

02 **Genres**: While the top genres are Sports, Sci-Fi, Animation, Drama and Comedy collectively, consider marketing specific genres within each country

03 **Expand our selection of movies:** For example by offering a wider choice of languages and movies We currently only offer movies in English and from 2006.

PROJECT DELIVERABLES

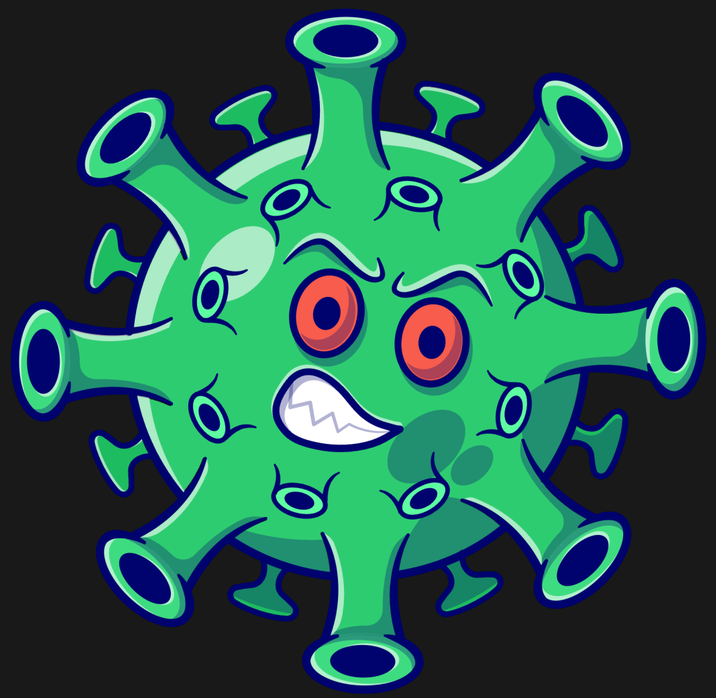
Click the icons to access the file

Project Presentation

Tableau - Storyboard

Project Technical File
– Hosted on GitHub

Data Dictionary



PREPARING FOR INFLUENZA SEASON

Investigating trends to assist in staffing agency needs

Preparing for Influenza season

Company

We will be aiding a medical staffing agency that provides temporary workers to healthcare facilities.

Context

The United States has an influenza season where more people than usual contract and suffer from the flu. This results in increased complications and hospitalizations. The increase of patients will require additional medical staff.

Problem Statement

In order to properly plan for the yearly outbreak, trends in influenza will be examined and used to proactively plan for staffing needs across the country.

Preparing for Influenza season

Assist a medical staffing agency with planning the disbursement of temporary workers to clinics and hospitals during the flu season throughout the United States

GOAL

- ✓ Identify who falls into the **vulnerable population** category and prioritize states with high percentages of these groups
- ✓ Determine **seasonality** of influenza and variances across states

DATA

- ✓ Influenza deaths by geography, time, age and gender Source: **CDC**
- ✓ Population data by geography Source: **US Census Bureau**

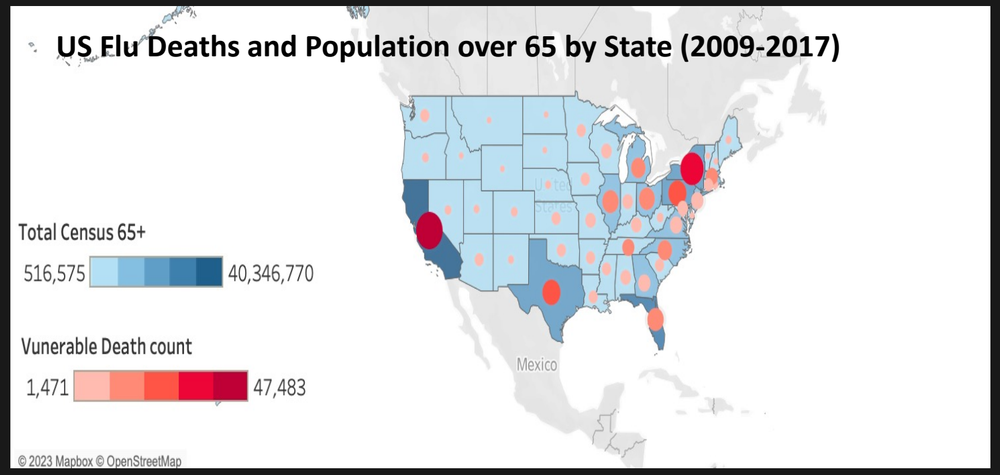
SKILLS > EXCEL >TABLEAU

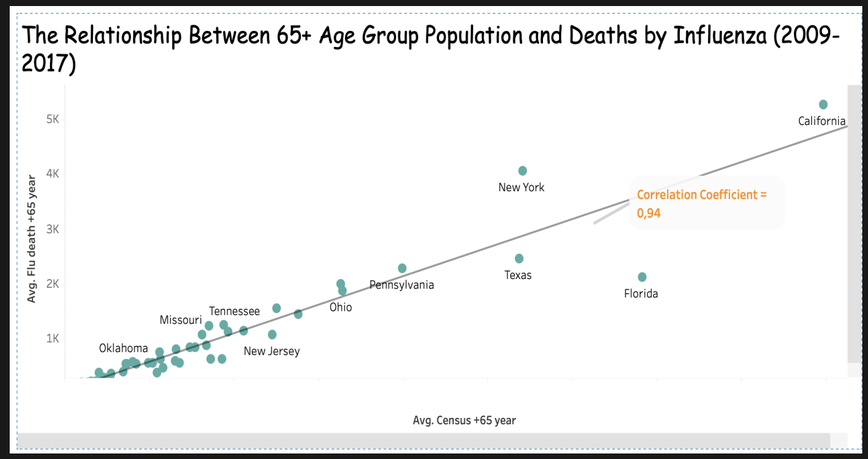
- ✓ Designing data research projects:
  - Formulating **hypothesis**
  - Data **profiling** and quality measures
  - Data transformation & integration
  - Conducting **statistical** analysis
  - and **hypothesis testing**
- ✓ Tableau Visualizations:
  - Composition & **comparison** charts
  - **Temporal** visualizations
  - **Statistical** visualizations
  - **Spatial** analysis
  - **Textual** analysis

Link to Project Brief

Analysis: Vulnerable Population Assessment

Determined that those age 65 and over are at higher risk for severe complications from the flu, and many of these individuals reside in California, New York, Texas, Pennsylvania, and Florida

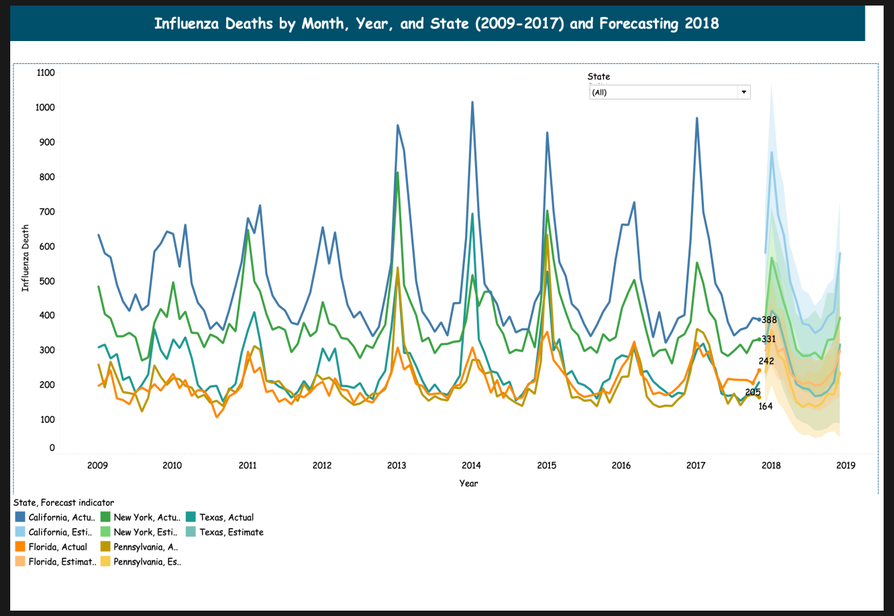


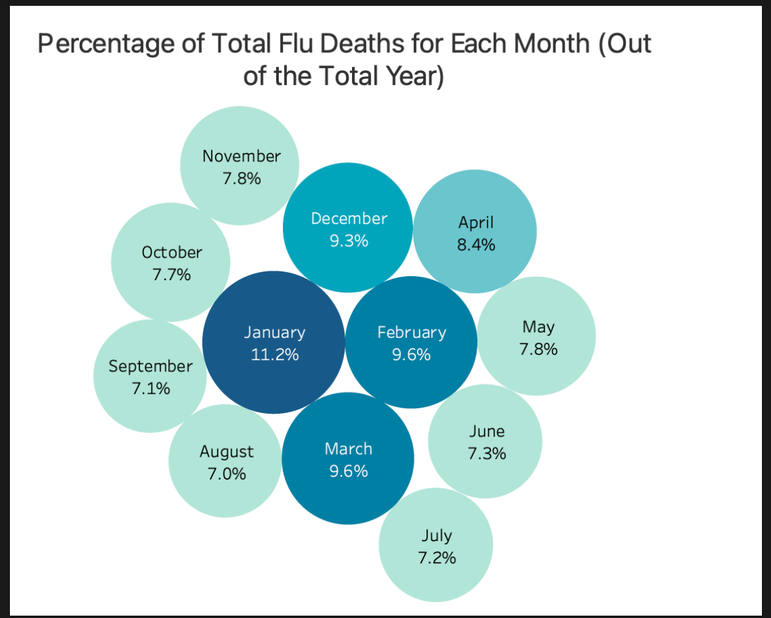


Individuals aged **65 and over** account for the majority of deaths caused by influenza

Analysis: Seasonality of Influenza

Winter months, from December to March have historically seen the highest number of flu deaths





There is **very little variability** between states in months with high flu deaths, which leaves no opportunity for staggered staffing plans

Recommendation for 2018 flu season

Recommendation:

Our forecast suggests a similar pattern of flu seasonality to the past nine years. The recommendation is to deploy additional medica staff to California, New York, Florida, Texas and Pennsylvania from December to March.

Next Steps:

1. Conduct further analysis on other vulnerable populations, as well as medical staff availability and hospital capacities.
2. Monitor the success of the project for future years.

PROJECT DELIVERABLES

Click the icons to access the file

Interim Report

Project Technical File

Presentation -Tableau
Story board

PIG E.BANK

Dive into Data Ethics issues and Data Mining

Pig E. Bank

Company

A well-known global bank needs help with it's anti-money-laundering compliance department.

Context

We have been hired to help the bank in running their compliance program more efficiently.

Problem Statement

We will help build and optimize models that assist the bank's compliance department assess client risk. will will help the bank predict client loyalty based on various factors.

Pig E. Bank

Use principals of data ethics to assist Pig E. Bank in navigating challenging issues and begin exploring the use of data mining and predictive analysis.

GOAL

- ✓ Use **decision tree algor**ithms to determine the probability of Pig E. Bank's customers leaving the bank
- ✓ Explore **ethical issues** within Pig E. Bank's operations

DATA

The dataset contains customer information, including credit scores, demographics, account details, and exit status from a bank.

Pig E. Bank's client data set, found. **here**

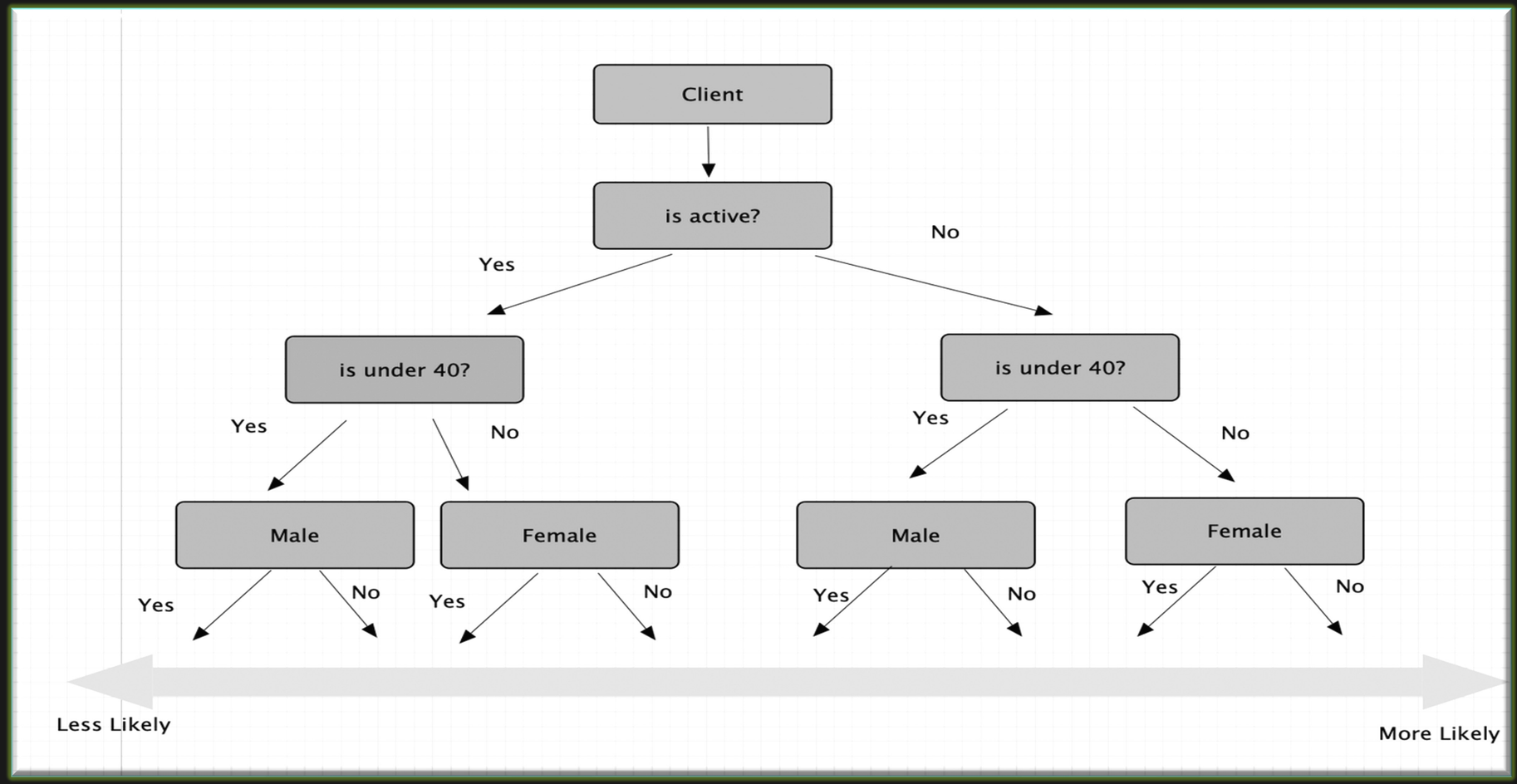
SKILLS

- ✓ Explore data ethics issues such as **data bias, security & priv**acy
- ✓ Begin exploring **data mining** and usage of **decision trees**
- ✓ Understand and utilize **CRISP- DM methodology**
- ✓ Utilize **time-series analysis**

Analysis: Probability of Clients leaving

According to a descriptive analysis on Pig E. Bank's data, the likelihood of a client leaving can be estimated using the below decision tree algorithm

Likelihood of Client leaving Bank



Additional Analysis Files & Deliverables

Click the icons to access the file

Data Bias CaseStudy

Exploration into various data bias type

Descriptive Analysis

Descriptive analysis of Clients's Pig E. Bank data

Data Privacy & Security Case Study

Senario analysis for Pig E. Bank data privacy and security issues

Time Series Analysis

Stationary vs Non-stationary exploration, moving average forecasting and introduction into Forecasting model

GAME CO.

Market trend analysis for video game development and sales

GameCo.

Company

GameCo is a new video game company that is interested in using data to influence the development of new games and how they will fare in the market.

Context

GameCo is interested in developing new games. In order to optimize their marketing, GameCo is interested in which markets to advertise to.

Problem Statement

GameCo wishes to analyze previous game sales in order to gain deeper insights. They are interested in exploring what variables impact a game's sales including: publisher, time, geographic region, and gaming category.

GameCo.

A fictitious video game company interested in descriptive analysis on market data to successfully develop new games

GOAL

- ✓ Determine genre popularity trends
- ✓ Determine largest publisher competitors
- ✓ Analyze market trends to determine video game popularity over time
- ✓ Uncover geographic sales differences

DATA

- ✓ Data set provided through VGChartz, found **here**
- ✓ Includes units of games sold from 1980 to 2016, represented in millions

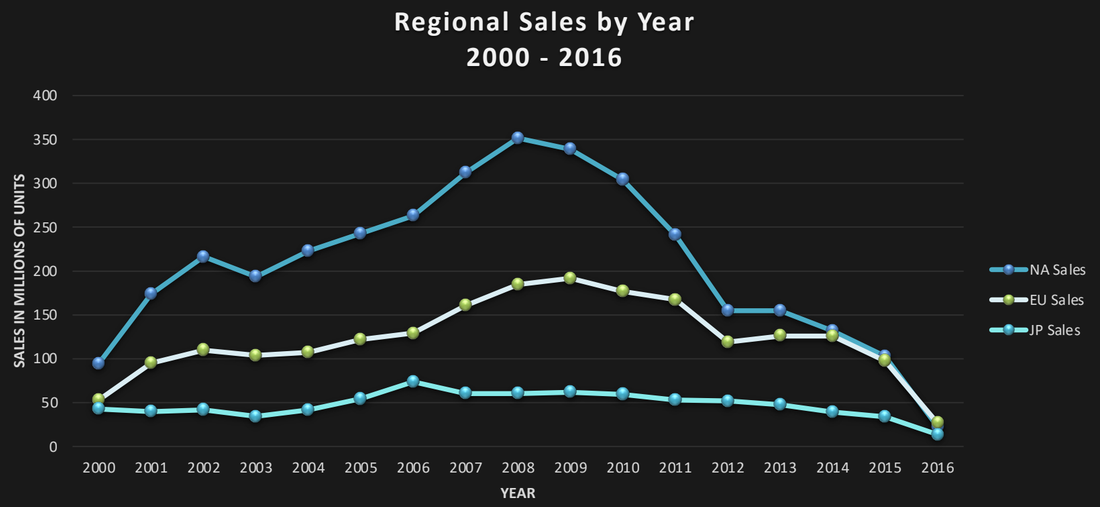
SKILLS > EXCEL

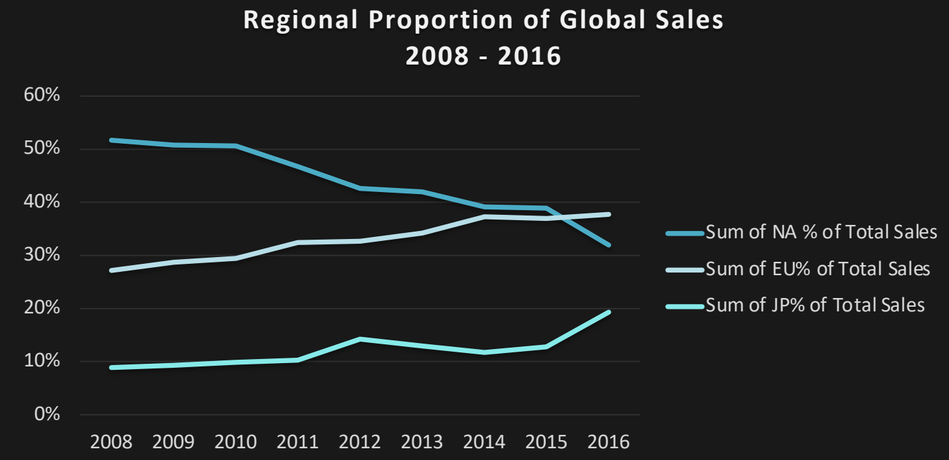
- ✓ Data cleaning techniques :**Grouping and summarizing** data through pivots tables and filtering
- ✓ Conducting **descriptive analysis**
- ✓ Visualizing insights through **scatterplots, box and whisker plots, and bar and column graphs**

Link to Project Brief

Analysis: Sales Trends

Video game sales varied over time regionally with a sharp decline over the past year





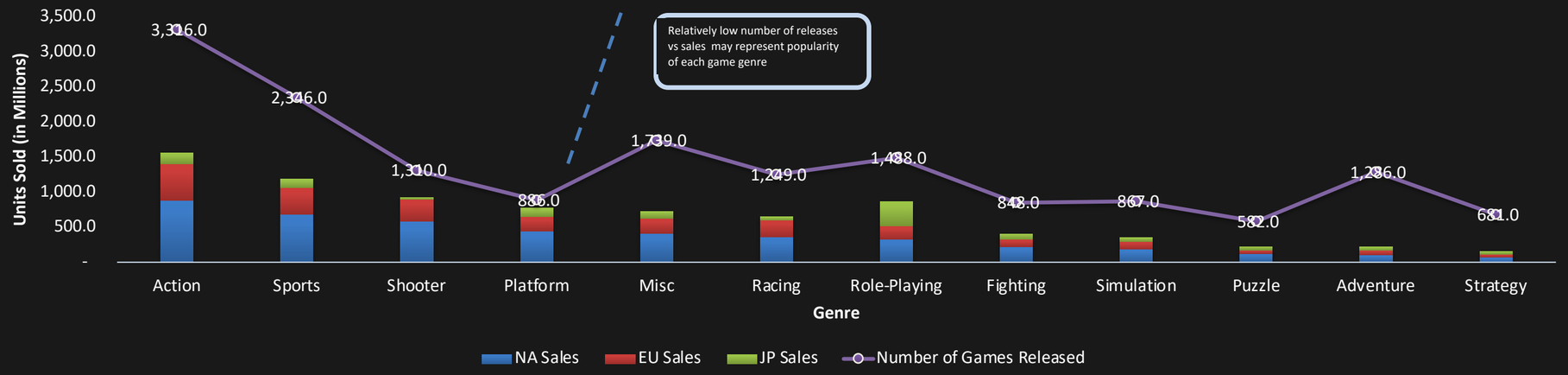
NORTH AMERICA
-78% Total sales decline from 2015
Both total and proportional sales have been on the decline since 2009

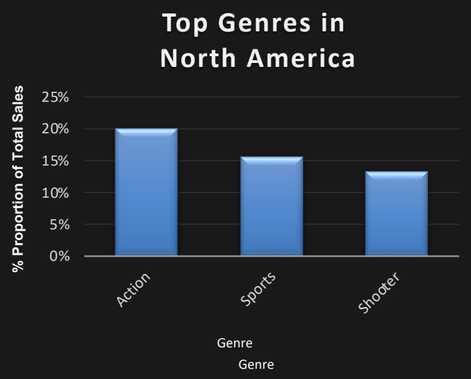
EUROPEAN UNION
-73% Total sales decline from 2015
Proportional of global sales has been on a steady incline since 2008– surpassed North America this year

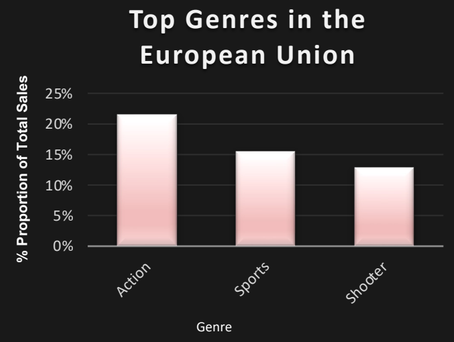
JAPAN
-59% Total sales decline from 2015
Trendin upwards in their contribution to global sales – could represent a market opportunity

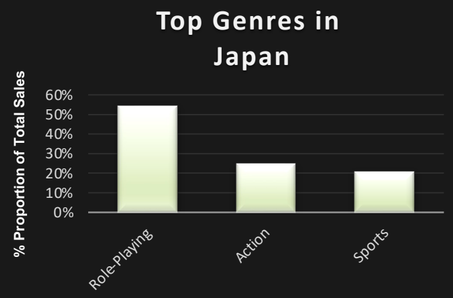
Analysis: Genre Popularity

Genre preferences are unique by region, but differ most in Japan ,Action games have higher game release numbers than any other genre, which is important in considering its popularity









Recommendation for Game CO

01

Market Trends: The EU has increased their market share the most steadily – focus marketing budget on this consistency

02

Genres: Consider Shooter & Sports genres for North America and European Union development, and Role- Playing genres for Japan

03

Platforms: Play station is the most consistently popular platform across all regions and should be prioritized if planning to develop games for one platform only

PROJECT DELIVERABLES

Click the icons to access the file

Project Presentation

Project Technical File

Project Reflections

Chocolate Bar Rating

Unleashing Advanced Analytics with Machine Learning Algorithms

Chocolate Bar Rating

Company

Chocolate is one of the most popular candies in the world. Each year, residents of the US collectively eat more than 2.8 billions pounds. However, not all chocolate bars are created equal!

Context

Each chocolate is evaluated from a combination of both objective qualities and subjective interpretation. A rating here only represents an experience with one bar from one batch.
The database is narrowly focused on plain dark chocolate with an aim of appreciating the flavors of the cacao when made into chocolate.

Problem Statement

To analyze chocolate bar ratings using advanced analytics to understand the factors influencing ratings and identify patterns related to cocoa percentage, regional excellence, chocolate bean variety, and cocoa bean origins."

Chocolate Bar Rating

Analyzing the world most famous chocolate bar on the basis of customer's rating

GOAL

- ✓ Determine best cocoa bean grown
- ✓ Determine manufacturer for best chocolate bars
- ✓ Analyze relationship between cocoa percentage and rating
- ✓ Understanding the current customer satisfaction via rating system

DATA

- ✓ This dataset contains expert ratings of 1,795 individual chocolate bars, along with information on their regional origin, percentage of cocoa, the variety of chocolate bean used and where the beans were grown.
- ✓ Data set provided through Kaggle, found **here**

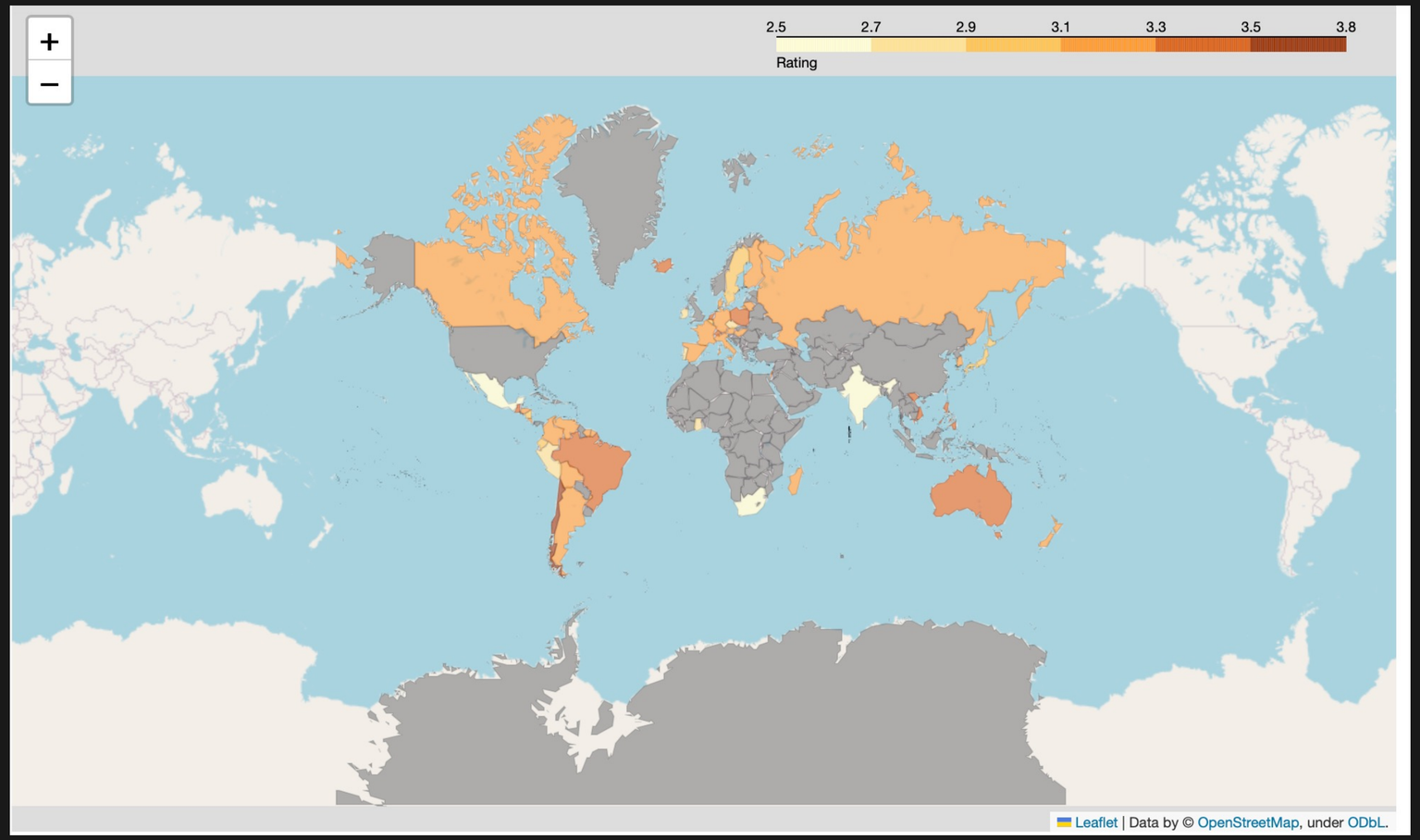
SKILLS > PYTHON>TABLEAU

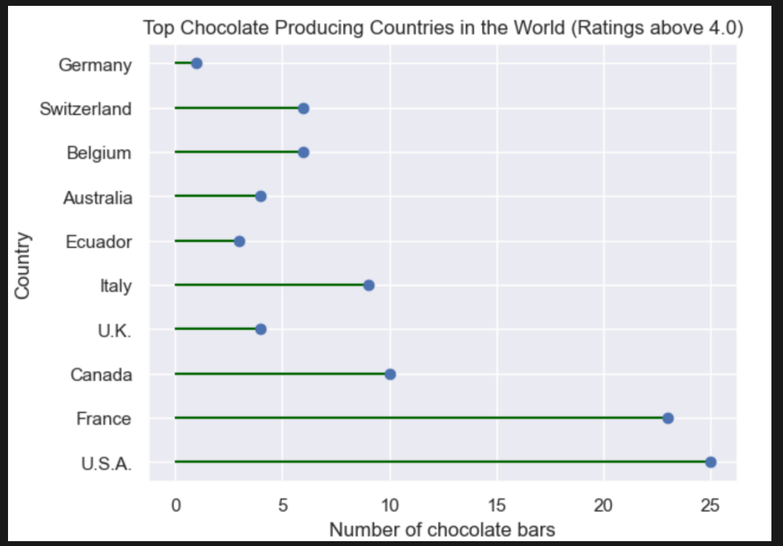
- ✓ Importing libraries, including **Pandas, Numpy, Matplotlib, ,quandl,Seaborn, Statsmodels.api, Sklearn, Pylab,Folium & Json**
- ✓ Analyzing data with different visualization
- ✓ **Exploring relationship** with with **Machine learning algorithms(Regression & Cluster Analysis**)
- ✓ Analyzing **time series** for predicting chocolate ratings

Link to Project Brief

Analysis: Geographical

Determine the all countries producing chocolate bar and top producing countries as per rating

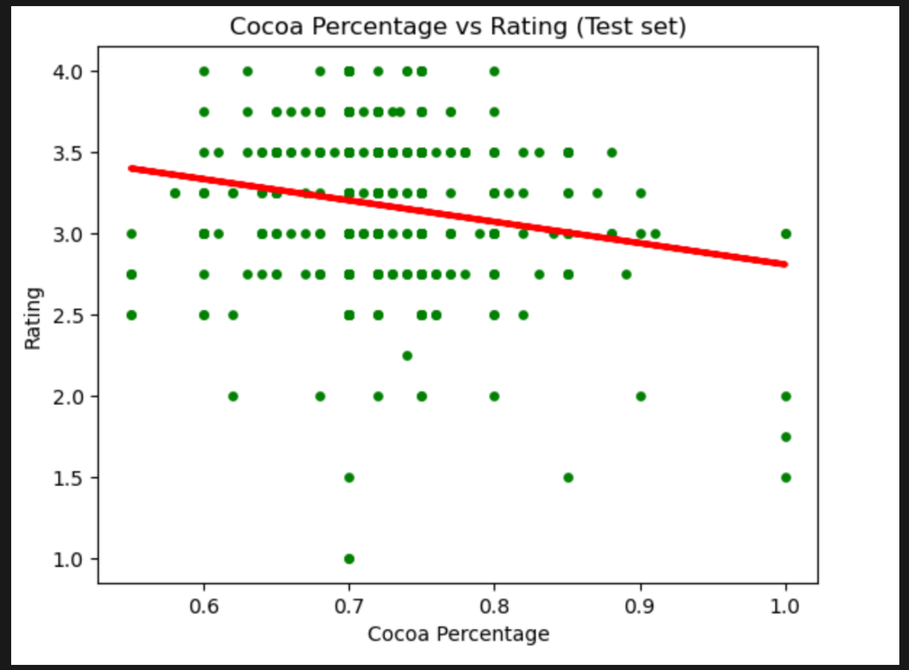


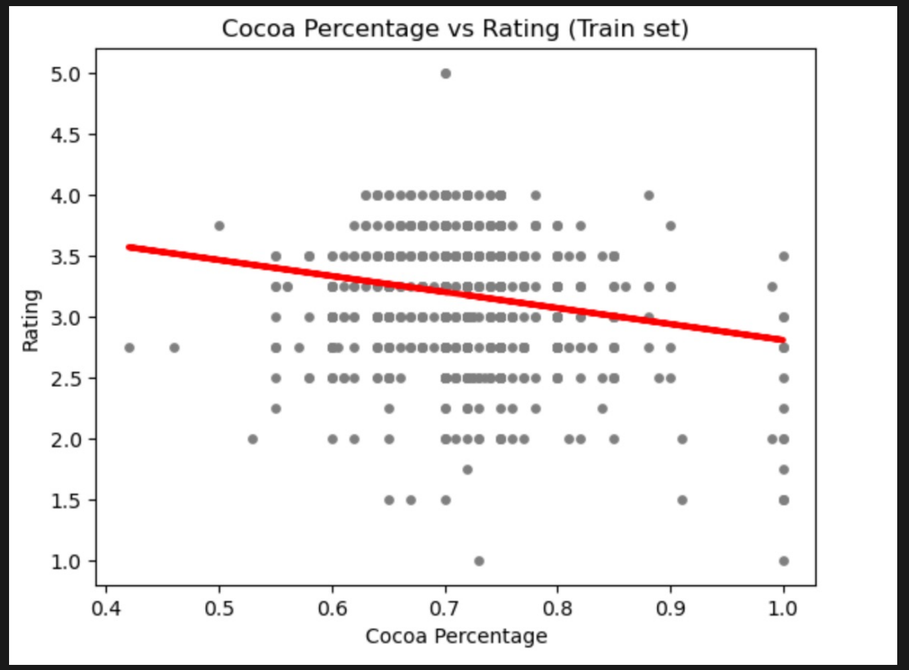


USA produces the highest number of 4 and above rated chocolate bars, followed by France

Analysis: Regression (Supervised Learning)

Determined the relationship between cocoa percentage and rating by creating Test and train set of data to evaluate the distance of the data point from the linear regression line.

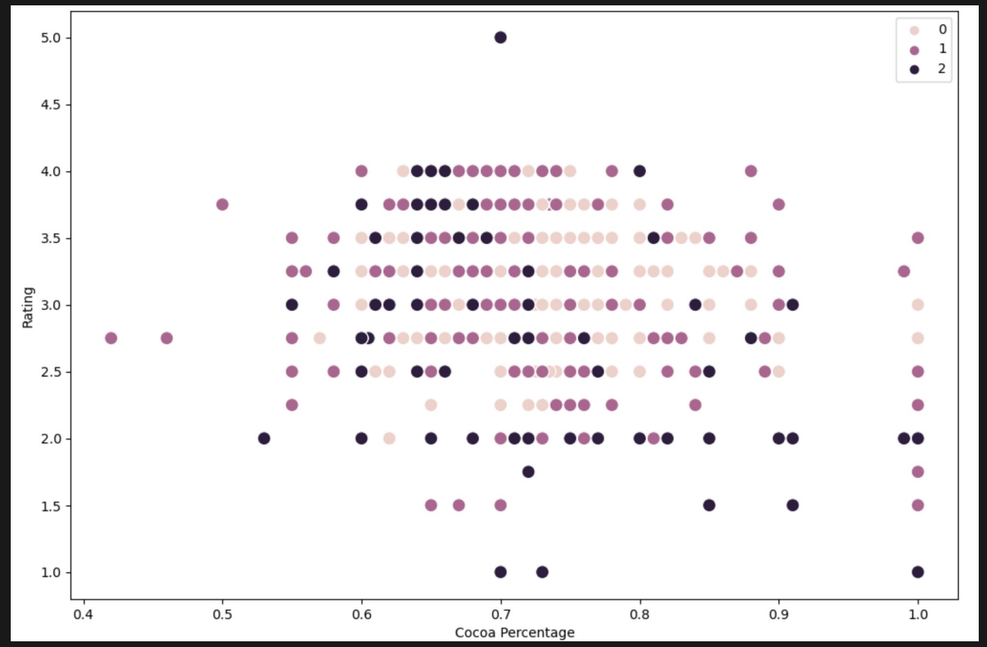




The model fits the training set only slightly better than the test set.
For both models, the R2 score is very low, which shows the the model is a poor fit and the relationship of the data variables is not purely linear.

Analysis: Cluster (Unsupervised Learning)

Analysis was performed to check for further insight between the variables (Cocoa Content and ratings).Three clusters were categorized



- ✓ The dark purple cluster mostly represents the chocolate bars with lower than average cocoa percent & ranges from 2 - 4 in ratings.
- ✓ The purple cluster mostly represents the bars with higher than average cocoa percent and also ranges from 2 - 4 in ratings.
- ✓ As for the pink cluster, it contains bars with a variety of cocoa percentages and ratings. Thus, the data points in the clusters are not consistent

Recommendation for Chocolate Bar Rating

01 Based on the analysis and conclusions, we recommend that for a company to maximize profit, 70% of cocoa beans in chocolate will give the best flavor.

02 Majority of the beans come from the South American continent and so may be cheaper getting cocoa beans from such areas.

03 For a company to maximize chocolate production, techniques used in the Soma company can be adapted to suit the local company.

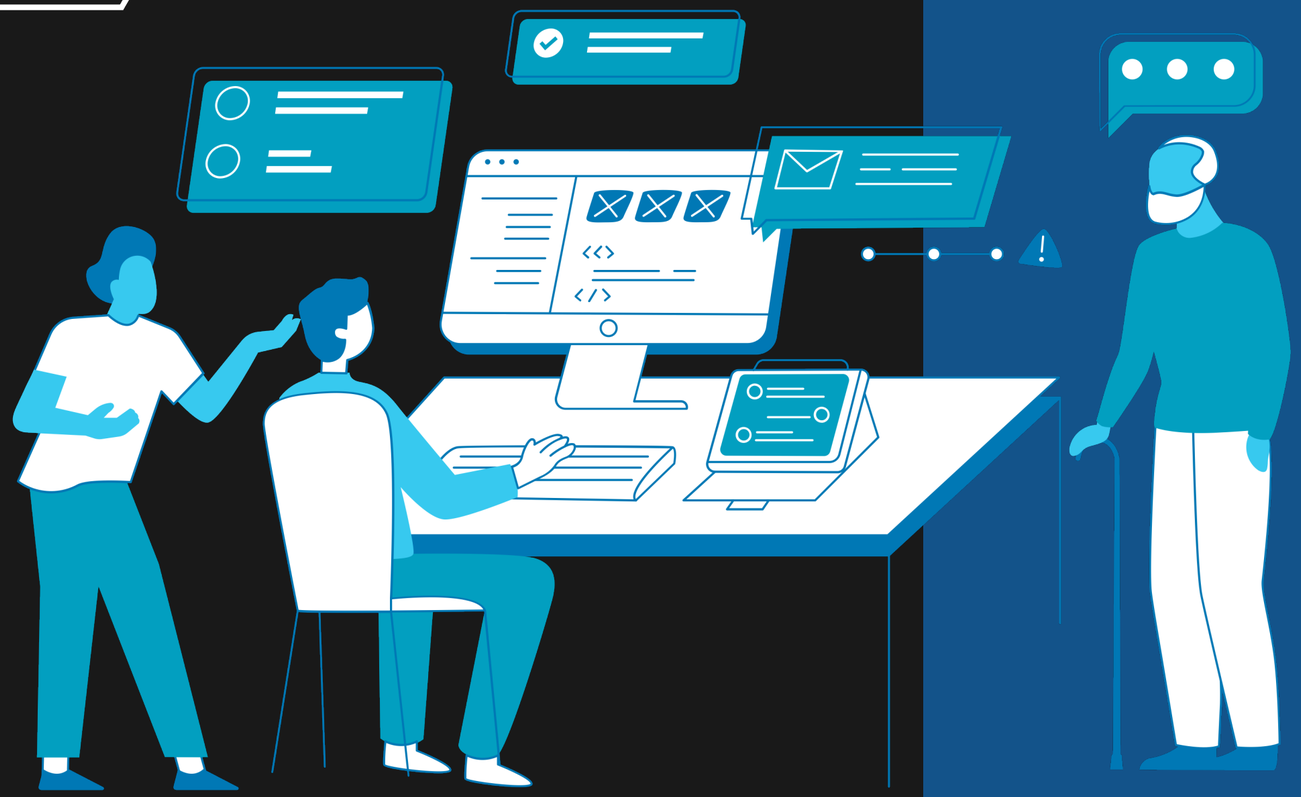
PROJECT DELIVERABLES

Click the icons to access the file

Tableau - Storyboard

Project Technical File
– Hosted on GitHub

THANK YOU



Do you have any questions?

priyanka08101991@gmail.com