D211 Performance Assessment Pt. 1

Advanced Data Acquisition

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# Part 1: Data Dashboard

## Data Sets

Data will be included in the submission. The sources of the data are the WGU churn dataset and US Census Bureau.

Data Source:

NST\_EST2023\_POP Annual Estimates of the Resident Population for the United States, Regions, States, District of Columbia, and Puerto Rico: April 1, 2020 to July 1, 2023 (US Census Bureau, 2023)

## Setting Up a Dashboard

**Prerequisites:**

1. **Tableau Desktop** installed on your computer.
2. **PGAdmin** installed on your computer
3. **Dataset** containing State, Churn, Revenue, and Population.

**Step 1: Create data and Load Data into Tableau**

1. **Create Database in PGAdmin**
   * SQL scripts to create the required tables.
   * Right click on the new database and select “Query Tool”
   * cut and paste the SQL script into the Query Tool
   * click Run.
2. **Import data into tableau**
   * Right-click on desired table
   * select “Import/Export”
   * Click “Import”
   * click Header “Yes”
   * browse to the contract.csv file
   * Repeat for the other tables
3. **Open Tableau Desktop:**
   * Launch Tableau Desktop on your computer.
4. **Connect to Data Source:**
   * Click on new data connection to a server – PostgreSQL
   * Sign in to the database
   * Click on File > Open... and select your dataset file (e.g., Excel, CSV).
   * Alternatively, click on the appropriate data source option on the Tableau start page and follow the prompts to load your data.
5. **Verify Data:**
   * Ensure the data is correctly loaded and the columns are correctly recognized.
6. **Create Connections**

**Step 2: Create Calculated Fields/ fix region**

1. **Customer Density:**
   * Go to the Data pane, right-click on your dataset, and select Create Calculated Field.
   * Name it " customer Denstiy" and use the formula:
   * Copy code

count([d211\_churn].[Customer Id])/sum([Population])\*1000

1. Create Region
   * right-click on Region
   * select **“**Geographic Role**”**
   * **“**Create from…”
   * **“**State**”**

**Step 3: Create a Density Details**

1. **Create a New Worksheet:**
   * Click on the New Worksheet icon at the bottom of the Tableau interface.
2. **Drag Fields to the View:**
   * Drag the “Region, State” collection to the Rows
   * double-click the new “Customer Density” measure, which will create the first column of the text table.
   * Double-click the “Population” measure
   * Double-click the “customer (count)” measure
   * drag the “churn” dimension to the Filters pane. Double-click and select “No” only.
3. **Adjust Color Settings:**
   * Click on the Color shelf and choose Edit Colors.
   * Select a color palette that clearly distinguishes the values. A sequential palette (e.g., light to dark shades) is often effective.
   * Change the Mark type to “Square” which will fill in each row.
4. **Tooltips:**
   * Add Column and Sub-Totals from Analysis.
   * Drag Totals over to view, then select “Subtotals”
   * then repeat to add “Column Grand Totals”

**Step 5: Create a Choropleth Map**

1. **Create a New Worksheet:**
   * Click on the “New Worksheet” button at the bottom of the Tableau interface.
   * Rename the worksheet to “density map.”
2. **Drag “Region, State” Collection:**
   * Drag the “Region, State” field to the main visualization area on the right side.
   * Change the mark type to “Map.” You should see a map of the United States with four regions outlined.
3. **Add Customer Density to Colors:**
   * Drag the “Customer Density” field to the Colors shelf in the Marks card.
4. **Filter Loyal Customers:**
   * Drag the “churn” dimension
   * Double-click on the “churn” filter and select “No” only. Loyal customers are indicated with Churn=”No”.
5. **Add Elements to Details**
   * Add Code to Details:Drag the “Code” field to the Detail mark on the Marks card.
   * Add Customer Count to Details:Drag the “customer (Count)” field to the Detail mark.
   * Add State to Details:Drag the “State” field to the Detail mark.
   * Add Population to Details:Drag the “population” field to the Detail mark.
6. **Add Elements to Labels**
   * Add Customer Density to Labels: Drag the “Customer Density” field to the Label mark on the Marks card.
   * Add State to Labels:Drag the “State” field to the Label mark.
   * Add Population to Labels:Drag the “population” field to the Label mark.
7. **Experiment with the Map View**
   * Experiment with the Map View:
   * Click the “+” sign next to “Region” to expand and collapse the view.
   * Notice how the view changes to outline the individual states when expanded and the regions when collapsed.
   * Ensure the individual states are outlined by clicking the “+” sign until the states are visible.

**Step 6: Create Summary worksheet**

1. **Create a New Worksheet:**
   * Click on the “New Worksheet” button at the bottom of the Tableau interface.
   * Rename the worksheet to “density summary.”
2. **Drag “Region” to Columns:**
   * Drag the “Region” field to the Columns shelf.
3. **Add Customer Density:**
   * Double-click on the “Customer Density” field.
4. **Add Population to Labels:**
   * Drag the “population” field to the Label mark on the Marks card.
   * Format the label as desired (e.g., change font, size, color).
5. **Add Customer Count to Labels:**
   * Drag the “customer (Count)” field to the Label mark.
   * Format the label as desired.
6. **Add Customer Density to Colors:**
   * Drag the “Customer Density” field to the Color mark on the Marks card.
7. **Change Mark Type to Square:**
   * Change the mark type from Automatic to Square.
8. **Filter Loyal Customers:**
   * Drag the “churn” dimension to the Filters pane.
   * Double-click on the “churn” filter and select “No” only to filter for loyal customers.

**Step 7: Create a Dashboard**

1. **Create a New Dashboard:**
   * Click on the New Dashboard icon at the bottom of the Tableau interface.
2. **Add Worksheets to the Dashboard:**
   * Drag each worksheet you created (e.g., both Choropleth Map) to the dashboard.
3. **Arrange the Layout:**
   * Arrange the worksheets and other dashboard components as needed to create a cohesive and informative layout.
4. **Add Filters and Interactivity:**
   * Add filters to the dashboard to allow users to interact with the data (e.g., filtering by region).
   * Ensure that filters are set to apply to all relevant worksheets.
5. **Add Titles and Descriptions:**
   * Add titles and descriptions to each worksheet and the dashboard to provide context and make the dashboard easy to understand.

**Step 7: Save and Share the Dashboard**

1. **Save the Workbook:**
   * Save your Tableau workbook by clicking on File > Save As and choosing a location on your computer.

## Interacting with Dashboard

**Accessing the Dashboard**

1. **Open Tableau:**
   * Launch Tableau Desktop or Tableau Reader on your computer.
2. **Open the Dashboard File:**
   * If the dashboard is saved locally, open the Tableau file (.twb or .twbx) by navigating to File > Open and selecting the file.
   * If the dashboard is published on Tableau Server or Tableau Public, go to the respective website, log in, and navigate to the dashboard.

**Interacting with the Dashboard**

1. **Navigating the Dashboard:**
   * The dashboard named “Customer Density Dashboard” should load, displaying various visualizations such as the density map and density summary.
2. **Using Filters:**
   * **Filter by Region:**
     + Click on a region in the “density summary” sheet. This action will filter the “density map” and other relevant details based on the selected region.
     + To clear the filter, click on the same region again or use the filter reset button if available.
3. **Exploring Data Points:**
   * **Hover Over Data Points:**
     + Move your cursor over different data points on the density map to see detailed tooltips with additional information such as customer density, state, population, and customer count.
   * **Click for More Details:**
     + Click on specific states or regions in the density map to focus on that area. This may trigger additional filtering or highlight specific details in other parts of the dashboard.
4. **Adjusting Views:**
   * **Zoom and Pan:**
     + Use the zoom controls (usually found in the lower-right corner of the map) to zoom in or out of the map. You can also click and drag to pan across the map.
   * **Switching between Region and State Views:**
     + Use the “+” sign next to “Region” in the density map to switch between viewing the data by regions or by individual states.
5. **Reading Labels and Legends:**
   * **Labels:**
     + Labels on the visualizations provide quick insights into the data points. Look for information such as state names, customer density, and population figures directly on the visualizations.
   * **Legends:**
     + Refer to the legends to understand the color coding and other visual cues used in the dashboard. The legends typically explain the meaning of colors and symbols used in the visualizations.
6. **Customizing the View:**
   * **Adjusting Filters:**
     + If there are additional filter options available (e.g., drop-down menus or slider bars), use them to customize the view further according to your needs.
   * **Resizing Panels:**
     + Click and drag the edges of the panels to resize the different visualizations within the dashboard for a better view.
7. **Exporting and Sharing:**
   * **Exporting Data:**
     + Right-click on a visualization or data point and select “Export” to download the data as an image, PDF, or Excel file.
   * **Sharing the Dashboard:**
     + If the dashboard is published on Tableau Server or Tableau Public, you can share the link with others. Use the “Share” button to get the link or embed code.
8. **Help and Support:**
   * **Using Help:**
     + Click on the “Help” menu in Tableau for guides and tutorials on how to use Tableau features effectively.
   * **Support:**
     + Contact your Tableau administrator or visit the Tableau support website for technical assistance if you encounter any issues.

## All SQL code

SELECT COUNT ( DISTINCT customer\_id ) AS "# Loyal Cust"

FROM customer

where churn = 'No';

-- new table for us states codes and abbreviations

create table us\_codes (

state\_id varchar(2),

State varchar(25),

Abbrev varchar(10),

Code varchar(2),

CONSTRAINT us\_codes\_pkey PRIMARY KEY (state\_id)

);

-- Table: public.payment

-- DROP TABLE public.payment;

CREATE TABLE public.payment

(

payment\_id integer NOT NULL,

payment\_type text ,

CONSTRAINT payment\_pkey PRIMARY KEY (payment\_id)

);

-- Table: public.location

-- DROP TABLE public.location;

CREATE TABLE public.location

(

location\_id integer NOT NULL,

zip integer,

city varchar(30),

state varchar(2),

county varchar(30),

CONSTRAINT location\_pkey PRIMARY KEY (location\_id)

);

-- Table: public.job

-- DROP TABLE public.job;

CREATE TABLE public.job

(

job\_id integer NOT NULL,

job\_title varchar(60),

CONSTRAINT job\_pkey PRIMARY KEY (job\_id)

);

-- Table: public.contract

-- DROP TABLE public.contract;

CREATE TABLE public.contract

(

contract\_id integer NOT NULL,

duration VARCHAR(30),

CONSTRAINT contract\_pkey PRIMARY KEY (contract\_id)

);

-- Table: public.customer

-- DROP TABLE public.customer;

CREATE TABLE public.customer

(

customer\_id text NOT NULL,

lat numeric,

lng numeric,

population integer,

children integer,

age integer,

income numeric,

marital text ,

churn text ,

gender text ,

tenure numeric,

monthly\_charge numeric,

bandwidth\_gp\_year numeric,

outage\_sec\_week numeric,

email integer,

contacts integer,

yearly\_equip\_faiure integer,

techie text,

port\_modem text ,

tablet text ,

job\_id integer,

payment\_id integer,

contract\_id integer,

location\_id integer,

CONSTRAINT customer\_pkey PRIMARY KEY (customer\_id),

CONSTRAINT customer\_contract\_id\_fkey FOREIGN KEY (contract\_id)

REFERENCES public.contract (contract\_id) MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

NOT VALID,

CONSTRAINT customer\_job\_id\_fkey FOREIGN KEY (job\_id)

REFERENCES public.job (job\_id) MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

NOT VALID,

CONSTRAINT customer\_location\_id\_fkey FOREIGN KEY (location\_id)

REFERENCES public.location (location\_id) MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

NOT VALID,

CONSTRAINT customer\_payment\_id\_fkey FOREIGN KEY (payment\_id)

REFERENCES public.payment (payment\_id) MATCH SIMPLE

ON UPDATE NO ACTION

ON DELETE NO ACTION

NOT VALID

);

-- new table for the add-on for services

create table services (

customer\_id varchar(30),

internetservice varchar(25),

phone varchar(3),

multiple varchar(3),

Onlinesecurity varchar(3),

Onlinebackup varchar(3),

DeviceProtection varchar(3),

techsupport varchar(3),

CONSTRAINT services\_pkey PRIMARY KEY (customer\_id)

);

create table survey\_responses (

customer\_id varchar(30),

timely\_responses int,

timely\_fixes int,

timely\_replacement int,

reliability int,

"options" int,

respectful int,

courteous int,

active\_listening int,

CONSTRAINT survey\_responses\_pkey PRIMARY KEY (customer\_id)

);

select

left(c.customer\_id,99) as "CUST\_ID",

c.location\_id as "LOC\_ID",

left(l.city,15) as "CITY",

l.state as "STATE"

from customer c

natural join location l

;