DAV6100: NYC Service Request &Median Income

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Agenda

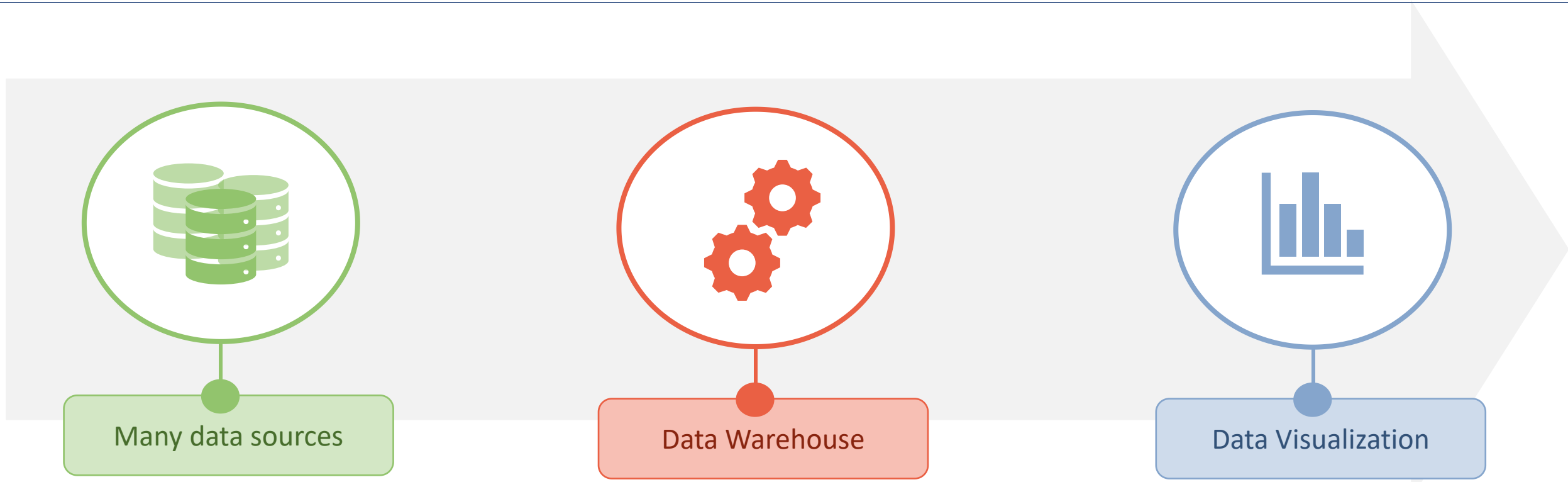
- Overview
- Project Requirements
- Data Profile
- Conceptual Architecture
- Demo
- Project Milestones & Timeline
- Team Responsibilities
- Challenges
- Lessons Learned

Overview

Using AWS services to store the Data Resouces

Using My SQL to store the Data Warehouse

Using Tableau to do the Business Analysis



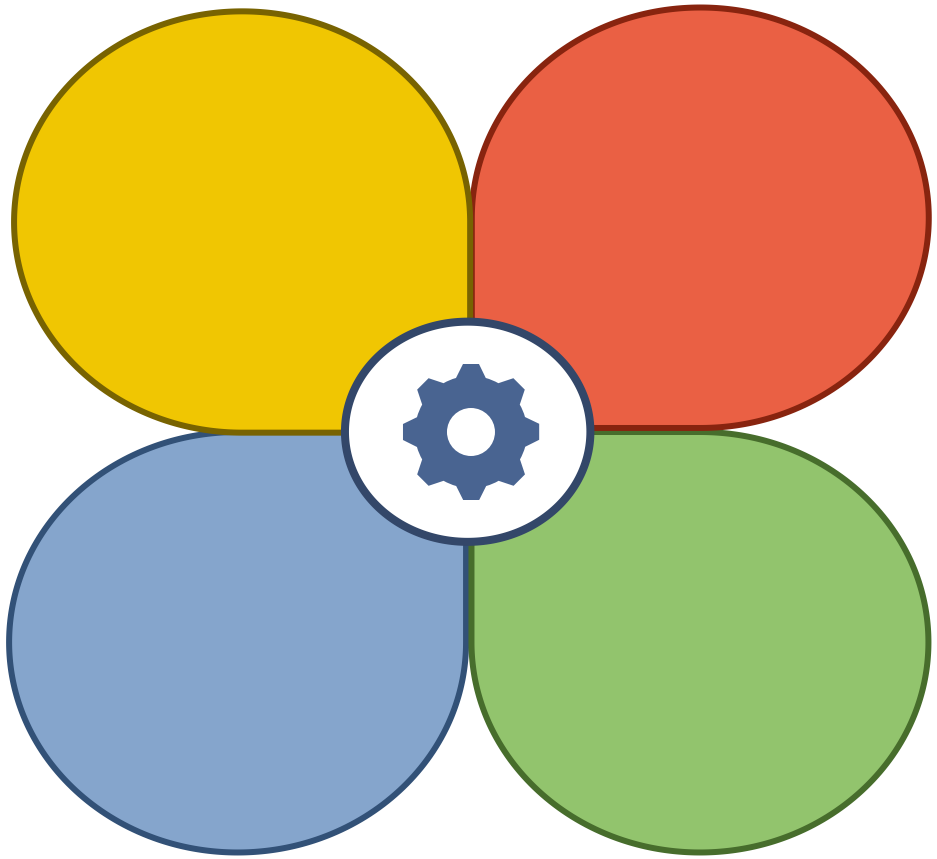
Project Requirements

1. Design, Document, & Plan

- ✓ Develop a conceptual design architectures
- ✓ Develop data flow diagrams and data models
- ✓ Define analytics concepts with bus matrix
- ✓ Define ETL Instructions
- ✓ Define data attributes

2. Develop and Build

- ✓ Develop the warehouse solution using Amazon Web Services as the platform
- ✓ Include two data structures:
  - Structured dataset
  - Semi/Unstructured dataset
- ✓ Integrations:
  - Batch/Migration
  - Real-time
- ✓ Data Visualization
- ✓ Code Repository (GitHub)



3. Test the Solution

- ✓ A prototype is to be test
- ✓ Break-testing and optimization of the database may be necessary (use of indexes)
- ✓ Ensure that error-handling scenarios are considered

4. Present and Deliver

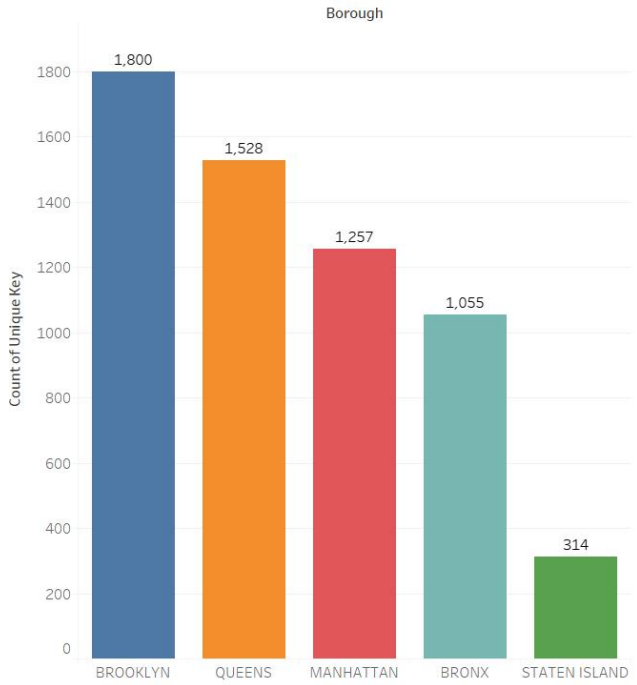
- ✓ Deliver an executive presentation
- ✓ Demo the architectural components
- ✓ Demo the visualizations in a data visualization platform like Tableau

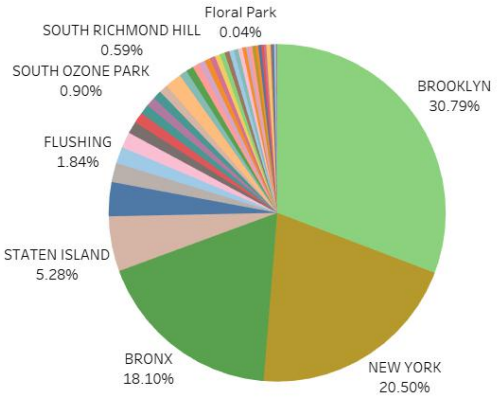
Data Profile 1: <<311 Service Request>>

Dataset Summary

Source of Information	https://data.cityofnewyork.us/Social-Services/311-Service-Requests-from-2010-to-Present/erm2-nwe9
Number of Records	Around 2021 records
Frequency of updates	per day
Data type and structure	Structured Data
Number of columns	41
Granularity	Service request event with details

Borough Incident Count & District Incident Count





Descriptive Statistics

Data Profile 2: <<NYC Median Income>>

Dataset Summary

Source of Information	https://data.cccnewyork.org/data/table/66/median-incomes#66/107/62/a/a
Number of Records	62 districts, 5 boroughs, 181 zipcodes
Frequency of updates	per day
Data type and structure	Unstructured Data
Number of columns	5
Granularity	Median income in each location in NYC area

Show tables in different regions

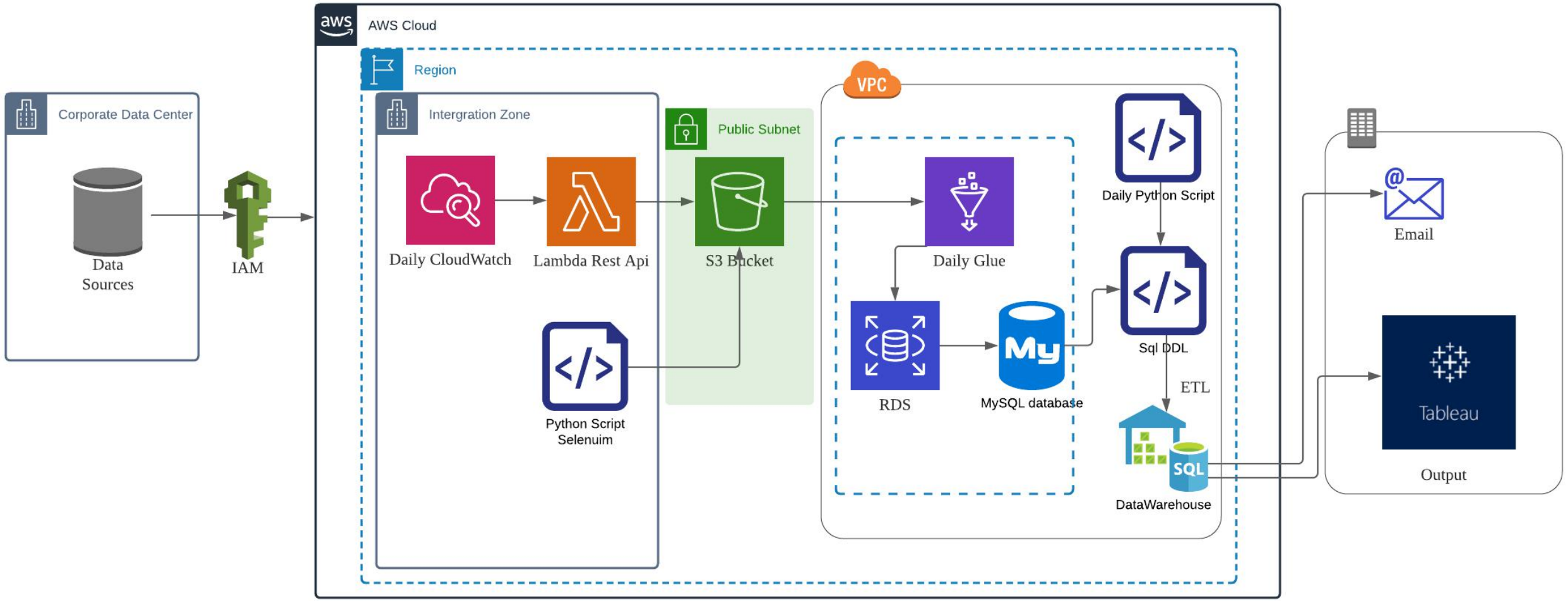
Location (N..	All Households
Bronx	$41,432
Brooklyn	$66,937
Manhattan	$93,651
Queens	$73,696
Staten Island	$89,821

Location (Nyc Distri..	All Households ..
ASTORIA	$79,180
BATTERY PARK/TRIB..	$162,092
BAY RIDGE	$76,569
BAYSIDE	$92,682
BEDFORD PARK	$41,336
BEDFORD STUYVES..	$61,186
BENSONHURST	$57,139
BOROUGH PARK	$55,071
BROWNSVILLE	$31,345
BUSHWICK	$66,275

Location ..	All Households..
10001	$92,840
10002	$36,982
10003	$118,161
10004	$190,223
10005	$189,702
10006	$179,044
10007	$224,063

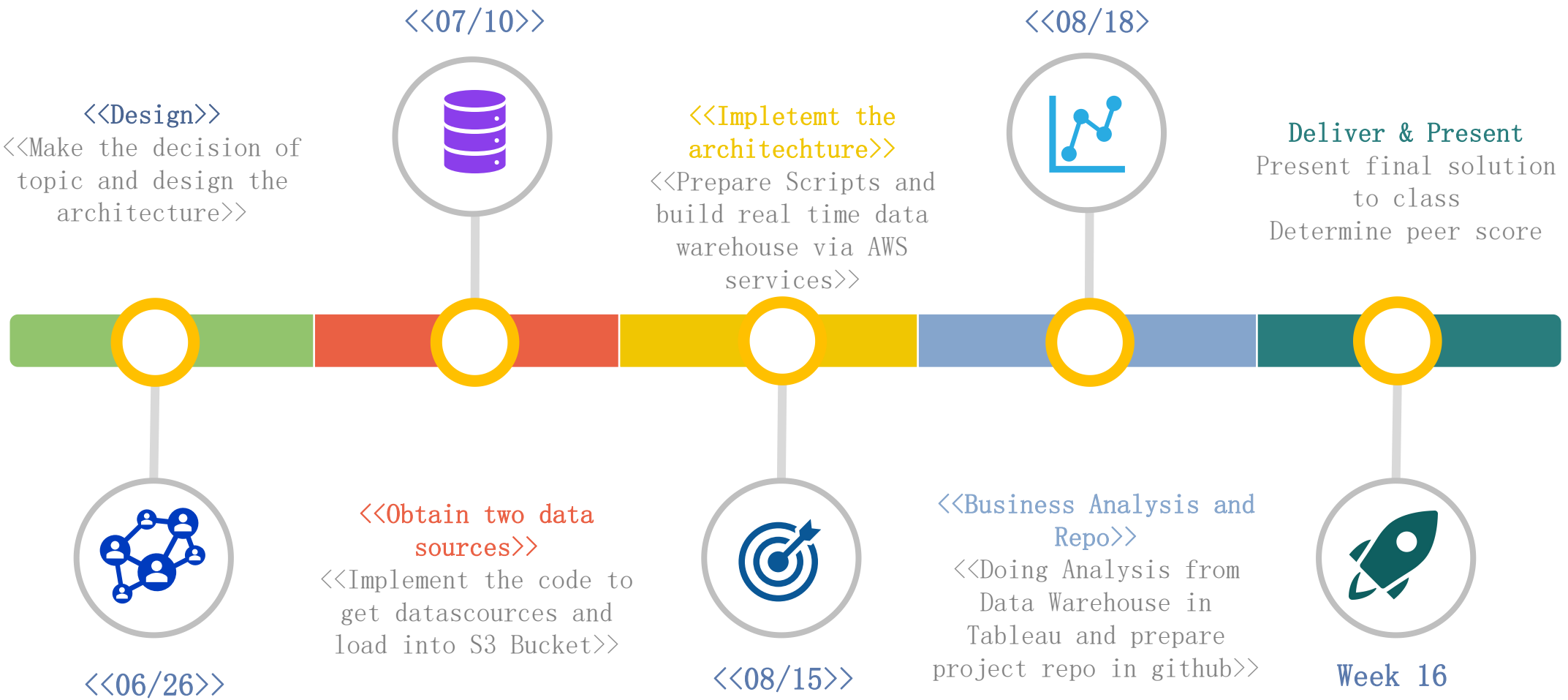
Descriptive Statistics

Conceptual Architecture



DEMO

Project Milestones & Timeline



Team Responsibilities

GROUP

Xiaolan Li

Obtained Data Sources, Implement AWS Services, ETL Data Sources to Data Warehouse, Built Github Repo, Presentation

Bernard Cooper

Created Research Questions, Obtained Data Sources, Created Data Warehouse, Tableau Data Analysis, Presentation

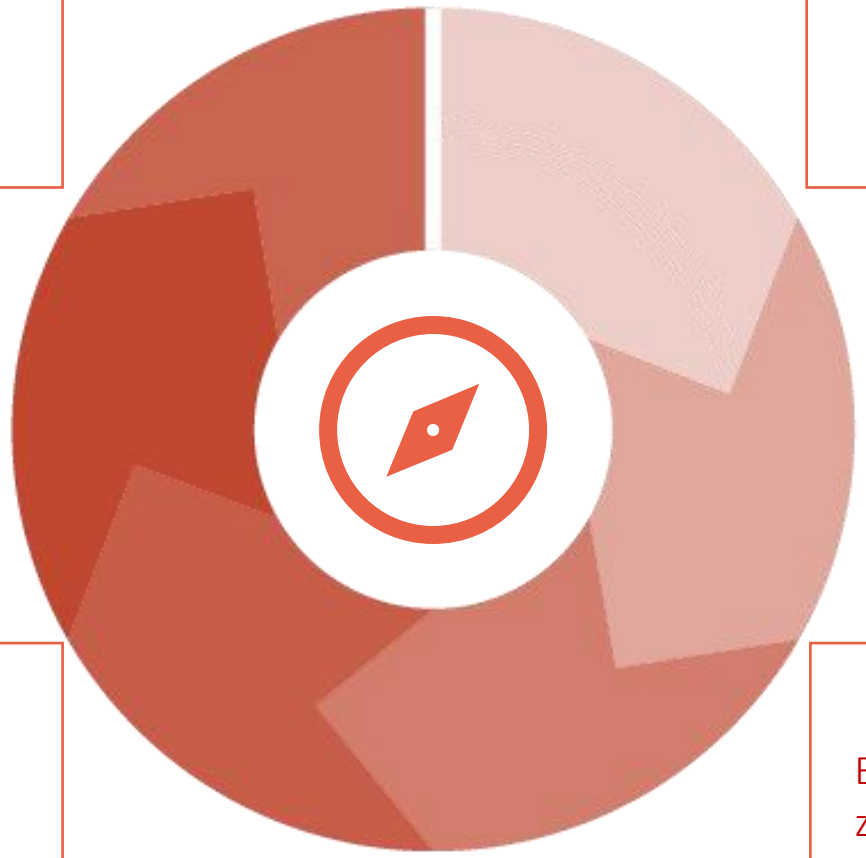
None

Assumptions

1. Illegal Parking is the highest frequent incident in service request.

2. Brooklyn, Newyork and Bronx are the highest frequent service request districts

3. The distribution of time to close in all incidents are right skew with a long tail



4. Zipcode 11226 has the highest frequent service request

5. There’s no strong correlation between median income and Borough as well as in zipcode but has a negative correlation with districts

6. Borough Queens, District Ridgewood, zipcode 11411 have highest average time to close incidents

Challenges

Lambda Functions with required packages (add whl files to match linux env)

Security group rule when connect the GLUE with RDS (add `All TCP` rule to Sg)

The JOB in GLUE can not detect the columns from data sources

(drop index, rename columns and drop first row in DDL)

Data Sources can’t match a lot district names between services request and median income info (replace the names of districts in median income data source)

Lessons Learned

The following are the key lessons learned from the project.

AWS Services:
- S3, RDS, GLUE, VPC, LAMBDA, IAM, CLOUDWATCH

ETL:
- Create Data Warehouse
- Update dimensional tables
- Update fact tables

Notification:
- Run SQL DDL
- Send email to notice

Tableau:
- Analyze the Data Warehouse
- Doing the regression and solve the research questions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