Seattle Food Inspections

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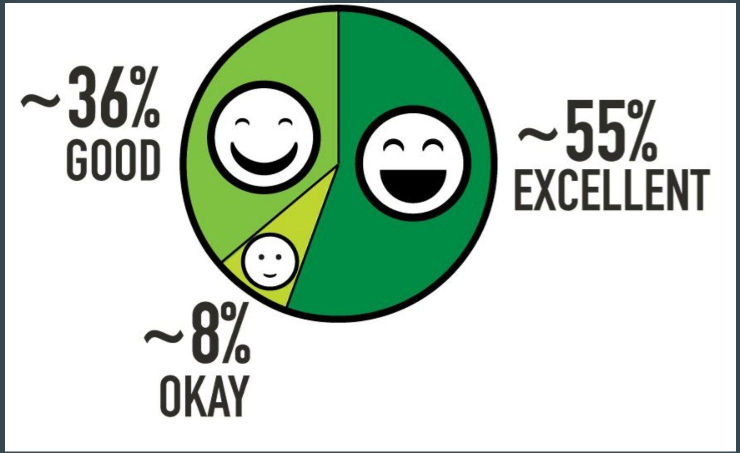
Introduction

- Starting 2012, jurisdictions across the country including King County have begun publishing **health inspection scores** using a standardized scoring system called LIVES.
- This open data allowed restaurant consumers to make informed decisions based on **where they want to eat** and motivated a lot of restaurant establishments to **improve their inspection score** in the hopes of attracting a bigger customer base.



Brief overview of the objectives

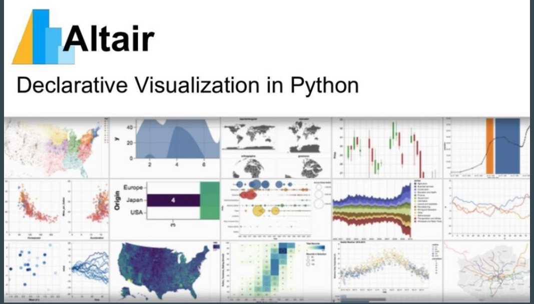
1. **Location Specific Contributions**: Where are the specific regions in Seattle that have the most high risk food safety violations?
2. **Interactive Map**: showing food inspection ratings in Seattle.
3. Then overlay these **ratings with demographic** information in the areas around restaurants.
4. Users will be able to explore **correlations** between the demographics and health inspection ratings to help make decisions about where to eat.

Package Dependency

Folium

GeoPandas in Python

Pandas



NumPy

Dataset

1. Food Establishment Inspection Data - ***King County Open Data***

	Name	Program Identifier	Inspection Date	Description	Address	City	Zip Code	Phone	Longitude	Latitude	Inspection Business Name	Inspection Type
0	@ THE SHACK, LLC	SHACK COFFEE	08/03/2019	Seating 0-12 - Risk Category III	2920 SW AVALON WAY	Seattle	98126	(206) 938-5665	-122.370913	47.570425	@ THE SHACK, LLC	Routine Inspection/Field Review

2. Median Income 5-Year Estimates (S1903) - ***American Community Survey***
3. Marital Status (S1201) - ***American Community Survey***

	zipcode	Population	No_Married(%)	Widowed(%)	Divorced(%)	Separated(%)	Never_Married(%)	No_Married	Widowed	Divorced	Separated	Never_Marriec
0	83501	28808	52.0	6.7	13.5	1.1	26.7	14980	1930	3889	316	7691
1	83822	1625	52.1	8.2	14.2	2.0	23.5	846	133	230	32	381

Data Cleaning

- Detecting **missing values** (tolerance)
    - (✓)Missing Violation
    - (✕)Missing Name / Grade
    - (✕)Unnecessary Identifiers
- Extracting desired **columns**
- Modifying the data (i.e. **type**, caps, etc.)
- Joining the census data by **zip codes**

```
SEATTLE          136455
BELLEVUE          19689
KENT              13705
RENTON            11805
FEDERAL WAY       11695
REDMOND           11159
KIRKLAND          10654
AUBURN             7752
ISSAQUAH           5846
SHORELINE          5185
Name: City, dtype: int64
```

Data Cleaning

- Shape: **(274970, 22)** >>> **(8413, 12)**
- Columns & Types

```
RangeIndex: 274970 entries, 0 to 274969
Data columns (total 22 columns):
Name                         274970 non-null object
Program Identifier           274970 non-null object
Inspection Date              274423 non-null object
Description                  274970 non-null object
Address                      274970 non-null object
City                         274970 non-null object
Zip Code                     274970 non-null object
Phone                        192911 non-null object
Longitude                    274959 non-null float64
Latitude                     274959 non-null float64
Inspection Business Name     274423 non-null object
Inspection Type              274423 non-null object
Inspection Score             274369 non-null float64
Inspection Result            274423 non-null object
Inspection Closed Business   274423 non-null object
Violation Type               156246 non-null object
Violation Description        156246 non-null object
Violation Points             274970 non-null int64
Business_ID                  274970 non-null object
Inspection_Serial_Num        274423 non-null object
Violation_Record_ID          156246 non-null object
Grade                        215640 non-null float64
dtypes: float64(4), int64(1), object(17)
```

```
Int64Index: 8413 entries, 134890 to 208625
Data columns (total 12 columns):
Name                          8413 non-null object
Inspection Date               8413 non-null datetime64[ns]
Description                   8413 non-null object
Zip Code                      8413 non-null int64
Inspection Type               8413 non-null object
Inspection Score              8413 non-null float64
Inspection Result             8413 non-null object
Inspection Closed Business    8413 non-null object
Violation Type                3853 non-null object
Violation Description         3853 non-null object
Violation Points              8413 non-null int64
Grade                         8413 non-null float64
dtypes: datetime64[ns](1), float64(2), int64(2), object(7)
```

Use Case

BMC Public Health

BMC

BMC Public Health. 2014; 14: 571.
Published online 2014 Jun 7. doi: 10.1186/1471-2458-14-571

PMCID: PMC4057591
PMID: 24908104

Factors affecting food handling Practices among food handlers of Dangila town food and drink establishments, North West Ethiopia

Ayehu Gashe Tessema,[1] Kassahun Alemu Gelaye,[1] and Daniel Haile Chercos[1]

- At least in NW Ethiopia, **certain demographic information** of the workers is associated with food handling practices.
- Users can see visually if such **correlation** between restaurant locations and some of the same demographic information (median income and various marital statuses) in Seattle.
- Users can use these **demographic statistics** to find what zip codes in Seattle to explore for new restaurants.

Demo

(transition to JupyterLab for demonstration)

Design

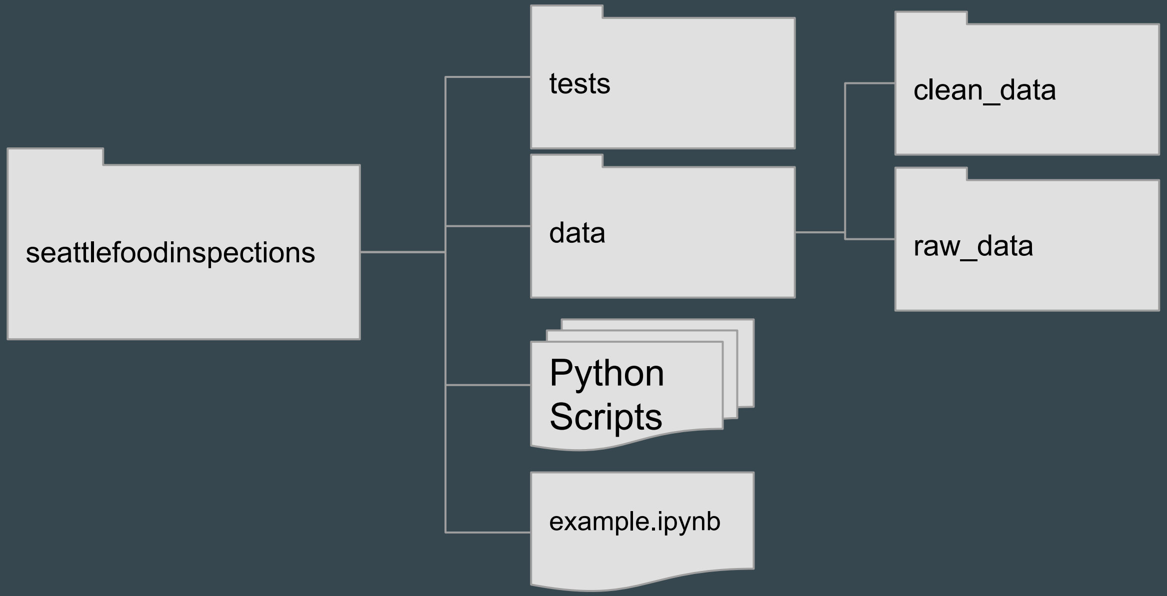
Data collection from URLs (inspections, census and geographic)

Cleaning datasets (remove null/NaN etc, erroneous locations ...)

Merging datasets (merge on restaurant zip code)

Visualizing (chloropleth of census data with interactive histograms, associated trend analysis charts)

(Partial) File Structure



Lessons Learned & Future Work

- Data sets are inherently "dirty" -> data science software requires significant data cleaning and preparation
- Modulation and generalization has up-front costs that pay for themselves in the long run
  - It's easy to write functions that work for one instance but which break easily

- Incorporate more robust census data
- Generalize functions to be used for any city/region

Questions?

Thank you