Final Presentation

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Project Overview

Goal of the Project

Analyze if market rate apartment rents are consistent with federal defined Fair Market Rents (FMR) levels in three distinct metropolitan areas.

What is FMR?

- FMR is the 40th percentile of gross rents for typical rental units paid by tenants that moved within the last 20 months.
- FMR provides an estimate for rents for the fiscal year starting Oct 2024-Sept 2025
- FMR is used to establish benefits such as the Housing Choice Vouchers used to help unhoused individuals find permanent housing.

Project Overview (cont.)

Potential Problem

FMR is an annually-released estimate that data does not capture the real-time economic realities that drive local housing markets.

Implications of Problem

Some individuals that are approved for housing assistance benefits are unable to find an apartment locally that they can pay for with their approved voucher amount based on their area's FMR. In other words, market rates tend to outpace FMR estimates when market conditions quickly drive rental prices up in certain areas.

About the Data

Data sources

- FMR data pulled from HUD using their publicly available API.
- Market rate data was scraped from the rental listing site Trulia

Narrowing our Data

- Atlanta (GA), Buffalo (NY) and San Diego (CA) Metropolitan Areas
- Apartments less than 3 bedrooms

Working with the HUD API

https://www.huduser.gov/portal/dataset/fmr-api.html

```
# Custom function to call HUD FMR & IL API
call_hud <- function(endpoint) {

  # init request
  req <- request("https://www.huduser.gov") |>    #domain
    req_headers("Accept" = "application/json") |>
    req_auth_bearer_token(token) |>
    req_url_path(paste("hudapi/public/fmr/", endpoint,sep="
    req_user_agent("Mozilla/5.0 (Windows NT 10.0; Win64; x6

  # parse response
  json_resp <- req_perform(req) |>
    resp_body_string() |>
    fromJSON()

  # return parsed response
  return(json_resp)
```

API Responses

Getting the Ids for the Metropolitan Areas

```
metro_areas <- call_hud("listMetroAreas")
```

```
## Rows: 3
## Columns: 3
## $ cbsa_code <chr> "METRO12060M12060", "METRO15380M15380"
## $ area_name <chr> "Atlanta-Sandy Springs-Roswell", "Buf
## $ state     <chr> "GA", "NY", "CA"
```

Getting the FMR Data by Zip Code for our Target Metropolitan Areas

```
for (i in 1:nrow(metro_areas)) {
  metro_fmrs <- rbind(metro_fmrs, get_metro_data(metro_area
}
```

```
## # A tibble: 6 x 5
##   area_name                    zip_code studio one_bedr
##   <chr>                        <chr>     <int>      <i
```

Tidying the FMR Data

```
metro_fmr_by_zip_and_num_bds <- metro_fmrs |>
  pivot_longer(
    cols = studio:two_bedroom,
    names_to = c("bedrooms"),
    values_to = "fmr"
  ) |>
  mutate(
    bedrooms = case_when(
      bedrooms == 'studio' ~ as.integer(0),
      bedrooms == 'one_bedroom' ~ as.integer(1),
      bedrooms == 'two_bedroom' ~ as.integer(2)
    )
  )
```

```
## # A tibble: 6 x 4
##   area_name                          zip_code bedrooms   fmr
##   <chr>                              <chr>       <int> <int>
## 1 Atlanta-Sandy Springs-Roswell 30002          0  1100
## 2 Atlanta-Sandy Springs-Roswell 30002          1  1150
```

Scraping Trulia