



# Flooding: Impact on Real Estate Values



NJ Raritan River

# Real Estate near the Raritan River

Rain Overflow

Central Jersey – Somerville and New  
Brunswick

Raritan

IDA  
Sandy

Real Estate

List Price

Were you looking at purchasing or investing in property in Central Jersey along the Raritan River?

Perhaps you are looking to identify bargain opportunities to purchase real estate and are considering insurance premiums and payouts.

You've come to the right place.

Next slides will provide insight into flooding potential and show if there is a relationship to residential real estate values.

# Our Findings

## MACHINE LEARNING MODELS

ModelsML\_Pricedrop.ipynb (This has detail test and train model for ML to predict NJ\_flood risk and house Pricedrop variaton Prediction).

### SUPERVISED LEARNING

1. Prileiminary code preprocessing (at this moment only newbrunswick and Bridgewater).

2. using ML codes ran

(Logistic Regression,Decision Tree,

RandomForest)

### RESULTS

1.logistic Regression gave 0.5988372093023255 accuracy

2.Decision Tree gave 0.7848837209302325

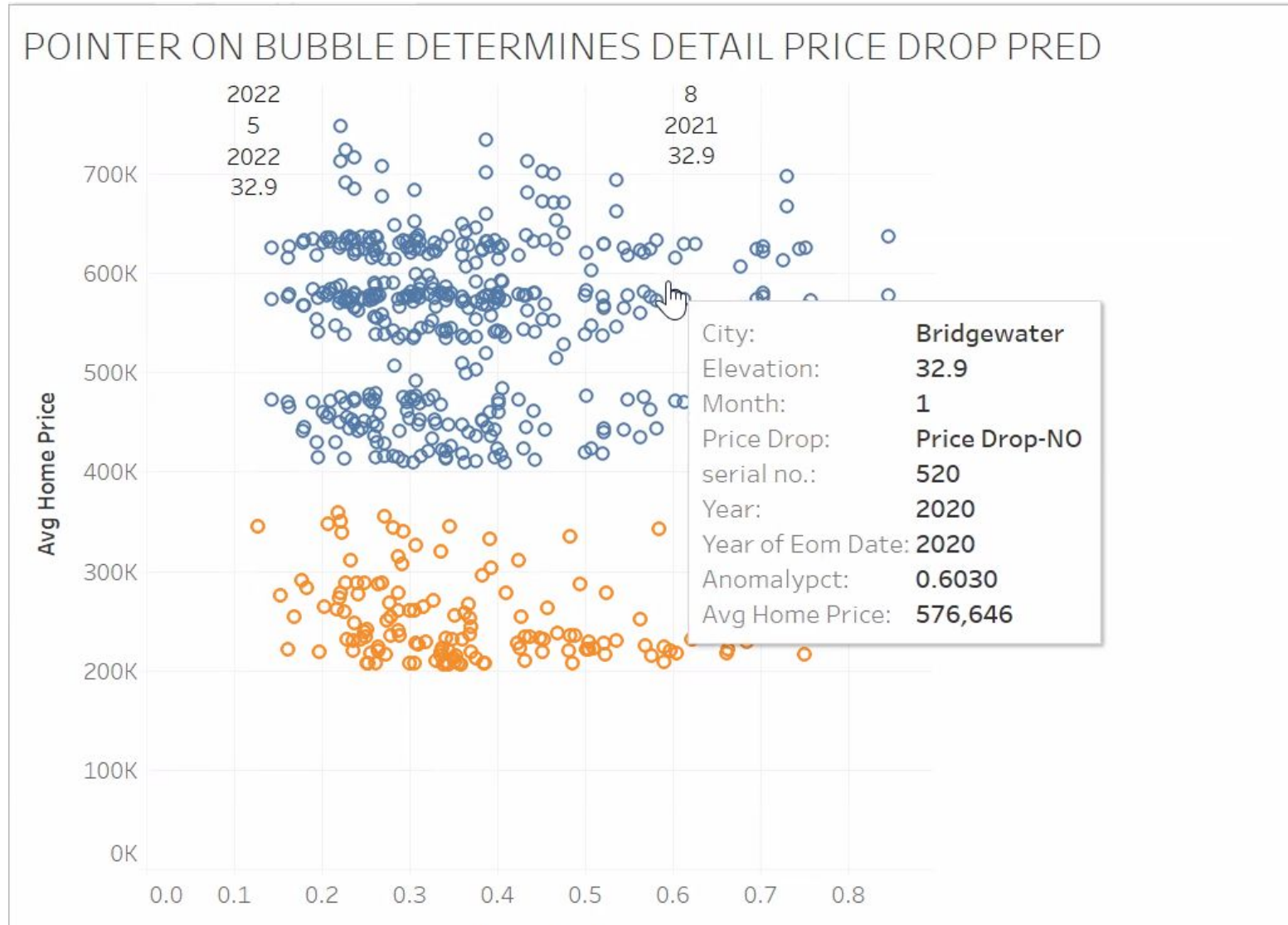
3.Random forest gave Accuracy Score : 1.0 -(which is to the perfection but in reality no data can be so perfect ,so ignoring this Model.)

### VISUALIZATION OF MODEL

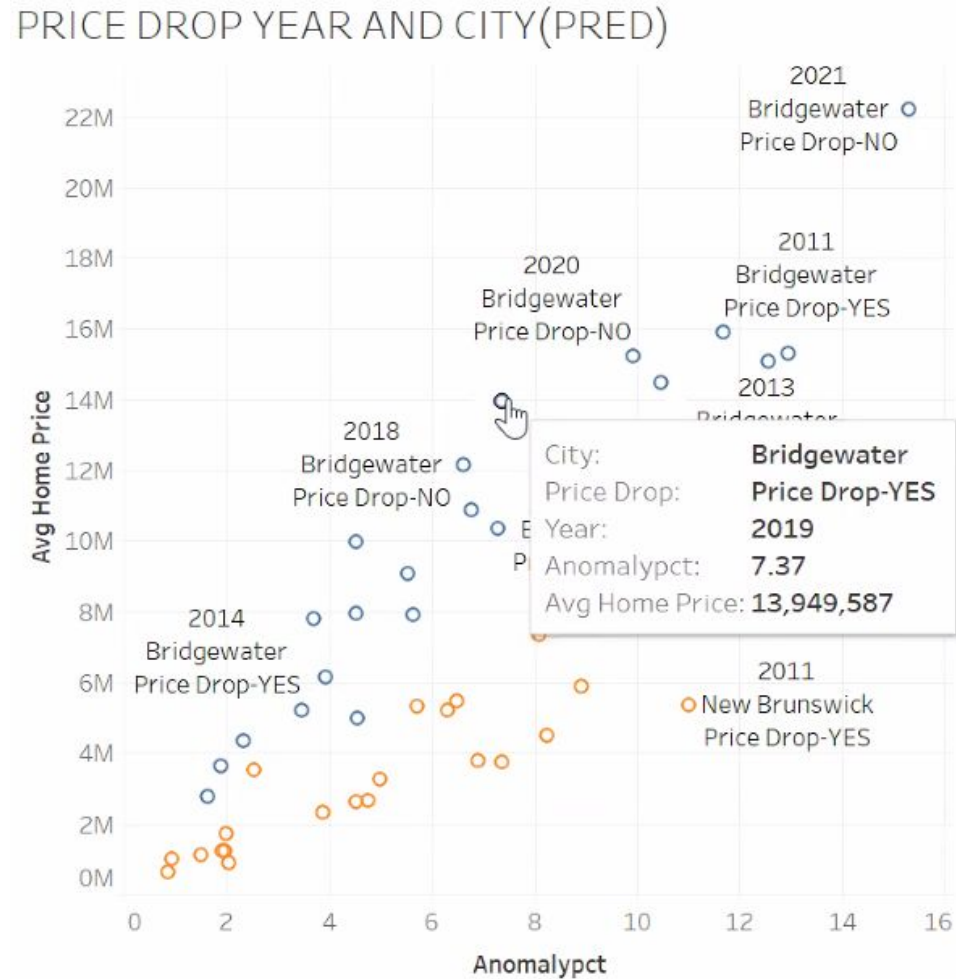
output is in folder TABLAUE VISUALISATION OF DATA-ARCHANA

Heatmaps Rain levels by Month  
Line Charts Rain vs. Pct change  
in Real Estate  
Bar Charts?

# Machine Learning - Precipitation Anomaly vs. Home Price

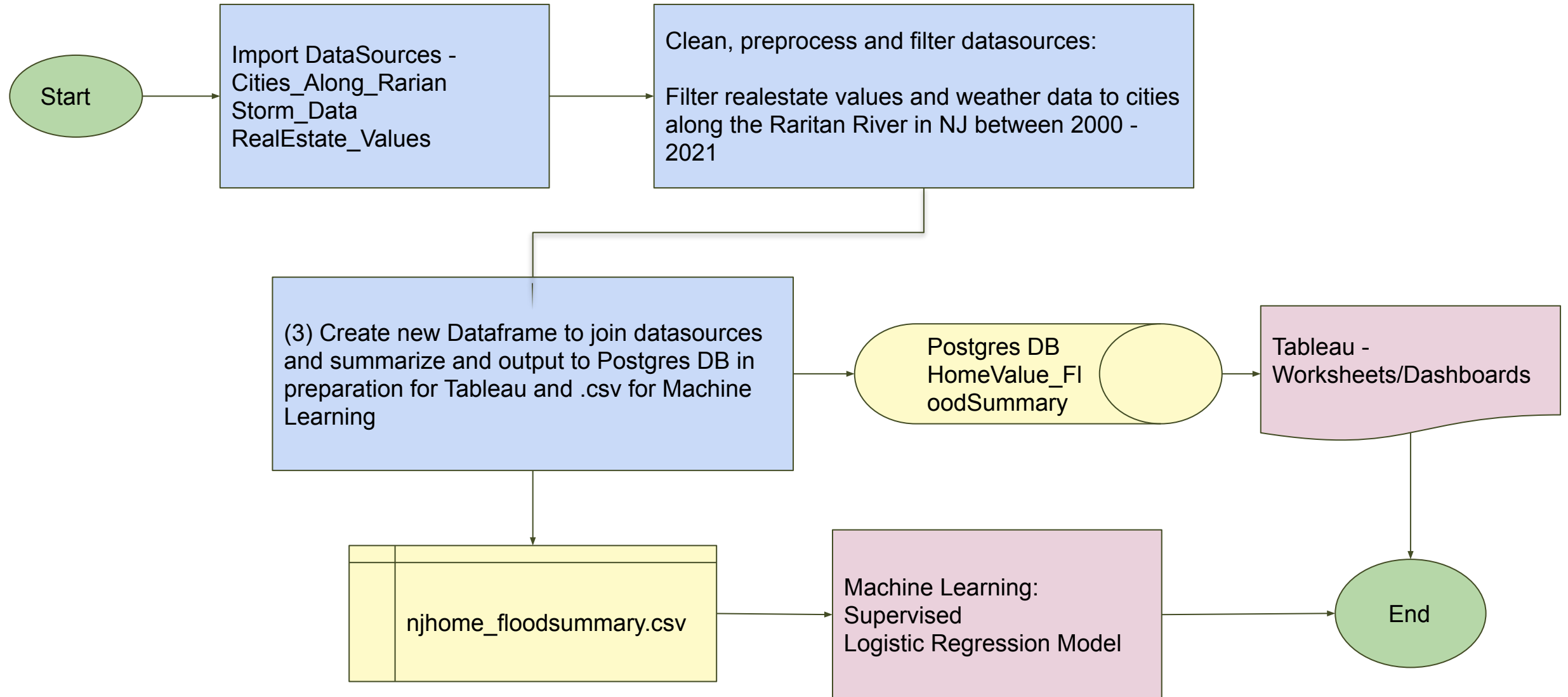


# Machine Learning - Price Drop By City



# Source Data Flow to Analysis Presentation

Github Repo: [https://github.com/c-ramos/NJ\\_Flood\\_Risk\\_Capstone](https://github.com/c-ramos/NJ_Flood_Risk_Capstone)



# Appendix

## Key Datasources and URLs

Dataset	DataSource	Details
Cities_Along_Raritan.csv	<a href="#">FEMA Flood Map Service Center   Search By Address</a>	Picked select cities along Raritan River, NJ. Also select 1 or 2 cities not prone to flooding in the nearby area.
daily_rainfall.csv (combined from all .csv's listed in /Resources/Cities CSVs	<a href="https://www.ncdc.noaa.gov/cdo-web/datasets">https://www.ncdc.noaa.gov/cdo-web/datasets</a>	Precipitation: daily rainfall in inches by city (historical from 2000 to 2021).
ZipcodePricealltypeshouse.csv	<a href="#">Housing Data - Zillow Research</a>	Average list price all homes (USD) by city (historical from 2000 to 2021

Infrastructure	Link
Jupyter Notebook / SQL scripts	Github Repo: <a href="https://github.com/c-ramos/NJ_Flood_Risk_Capstone">https://github.com/c-ramos/NJ_Flood_Risk_Capstone</a>
AWS RDS - Postgres	Endpoint:
Tableau	<URL> to Dashboard
Machine Learning Models	Supervised => Logistic Regression, Decision Tree, Random Forest Regression. Determine best model.



## Jupyter Notebooks, SQL scripts and Output Files (Preparation for ML and Tableau data)

Jupyter Notebooks and SQL Scripts	Description	Input Files	Output to CSV	Postgres DB Table Name
ConvertRain.ipynb	Cleans daily_rainfall, calculates mean, max, total rainfall for the month and identifies if there was an anomaly event (storm) that took place within the month.	daily_rainfall.csv	per_city_rainfall_final.csv	per_city_rainfall
CleanCities_and_HomePrice.ipynb	Cleans cities, transposes dataframe to calculate historical realestate list prices by city, month and year.	ZipcodePriceallty peshouse.csv	njhomeprice_final.csv	njhomeprice
schema.sql	Creates tables in Postgres DB	n/a	n/a	per_city_rainfall cities njhomeprice njhome_floodsummary
njhome_floodsummary.sql	Joins the rainfall table to the real estate home listing table to export to .csv for machine learning and Tableau worksheets/dashboard	n/a	n/a	njhome_floodsummary
NJ_FloodSummary.ipnyb	Generates final .csv for use by Tableau and Machine Learning.	AWS	njhome_floodsummary.csv	njhome_floodsummary
ML_Pricedrop.ipynb	Data split into test and train. Models analyzed and most accurate model determined.	njhome_floodsummary.csv	Tableau pictures provided	

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# Analysis - Tableau Description

Interactive Map – choose year and quarter

Displays markers for each of the 11 cities

Marker info includes:

City

Precipt for qtr

avg real estate value

[Link to Tableau Dashboard](#)

# Real Estate



2012

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9%



2013

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22%



2014

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46%



2015

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50%



2016

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65%



2017

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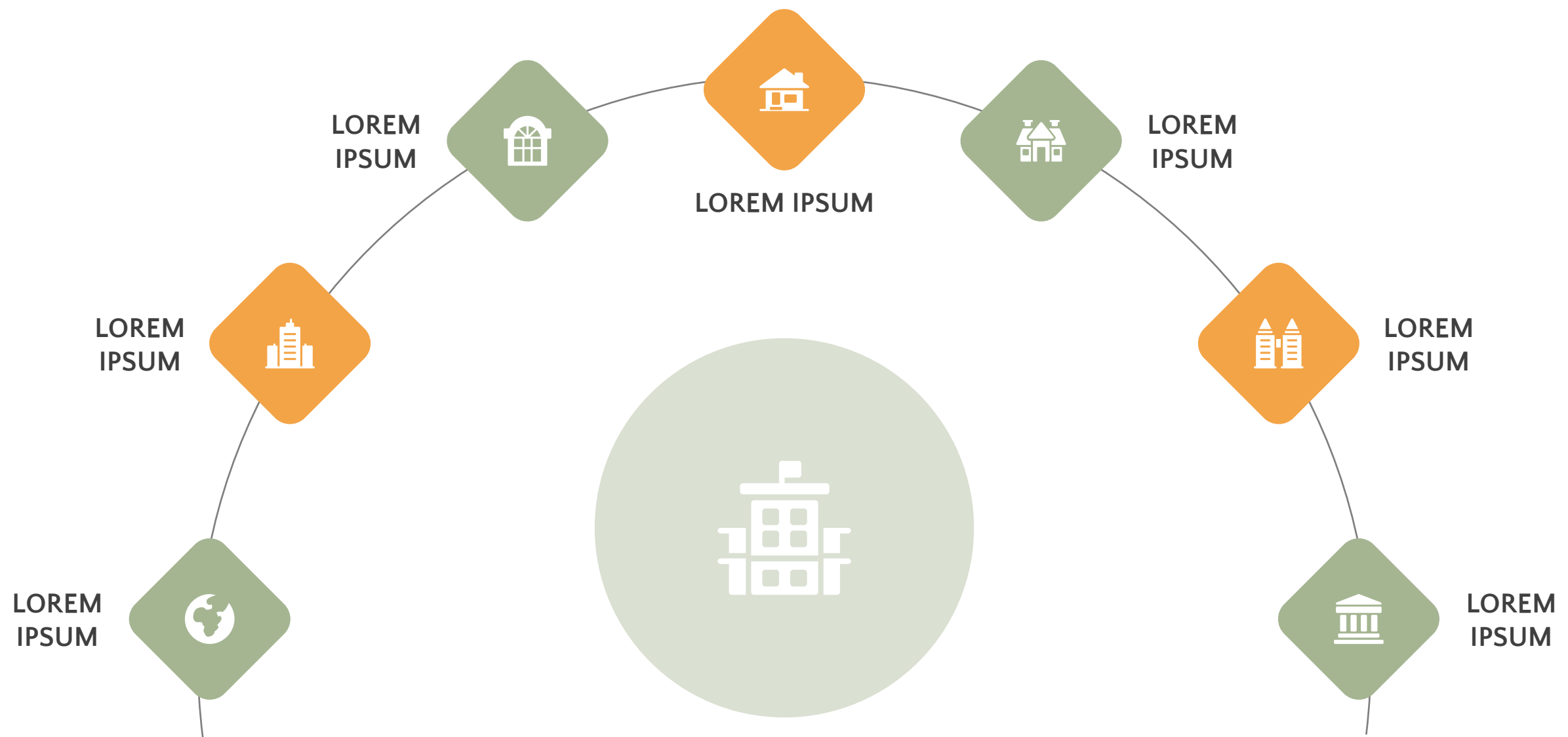


2018

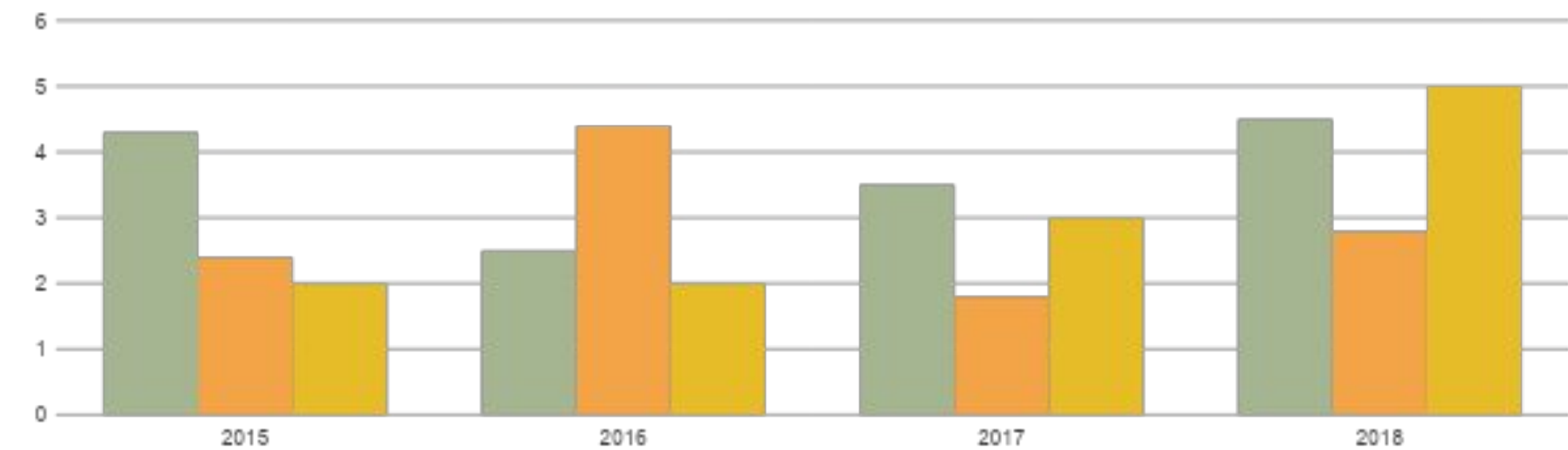
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# Real Estate



# Real Estate



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# Real Estate

2017



15%

Home sold

13,635

Average Home  
Price

\$15,454

2018



25%

Home sold

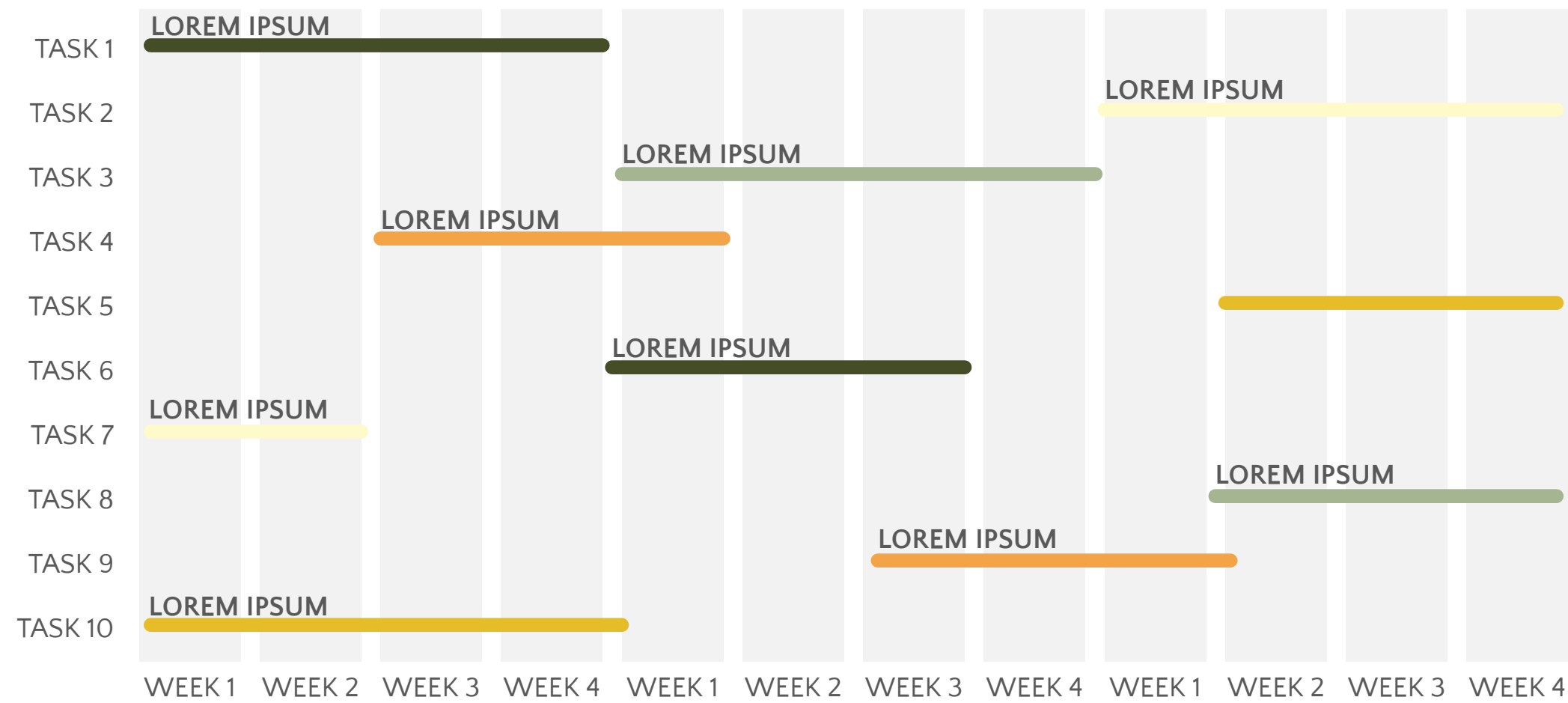
17,725

Average Home  
Price

\$20,885

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# Real Estate



# Real Estate

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89%





**THANK YOU**