# **Documentation: King County House Price Mapping in Python**

## 1. Objective

This project visualizes housing data from the King County dataset (kc\_house\_data.csv) on an interactive map using Python. The main objectives are to:

* Visualize the geographic distribution of homes using latitude and longitude
* Represent house prices using marker color and size
* Enhance usability with interactive tooltips that display key house details

## 2. Dataset

File Name: kc\_house\_data.csv

Source: King County, Washington real estate data

Key Columns Used:

* *price*: Sale price of the house
* *lat*: Latitude coordinate
* *long*: Longitude coordinate
* *bedrooms*: Number of bedrooms
* *bathrooms*: Number of bathrooms
* *sqft\_living*: Square footage of living space
* *yr\_built*: Year the house was built

## 3. Tools and Libraries

**pandas**: For reading and manipulating tabular data

**numpy**: For numeric operations and transformations

**folium**: For creating interactive web-based maps

**matplotlib**: For creating color mappings based on data

**os**, **webbrowser**: For file path handling and automatically opening the output map

## 4. Instruction(s) on Code Execution

1. Installation of external packages is required for the code to run. Use *pip install package-name* to install the necessary packages (packages required: **pandas**, **numpy, folium,** **matplotlib**)
2. Please ensure that the data source (kc\_house\_data.csv) is saved in the same folder as the python file. This ensures that the code will have the correct file path to the dataset.

## 

## 5. Steps Performed

### a. Find and Load Data

* Find the local file path using **os** that the CSV file is stored in
* Load the CSV file into a **pandas** DataFrame.

### b. Prepare Price-Based Color Groups

* Divide house prices into 10 quantiles (deciles) using **pd**.qcut.
* Generate a color palette using **matplotlib**'s plasma colormap.
* Assign each price quantile a color and store it in a new column price\_color.

### c. Create Interactive Map. Initialize a **Folium** map centered on the average latitude and longitude of the dataset.

Add a circle marker for each home:

* Location is based on latitude and longitude. Radius is scaled using the logarithm of the house price.
* Fill color is based on the price quantile color.

Tooltip is added to each marker showing:

* Price
* Number of bedrooms and bathrooms
* Square footage
* Year built

### d. Save and Display Map

* Save the map as an HTML file (house\_price\_map.html) in the same directory as the script.
* Automatically open the map in the default web browser.

## 6. Output

An interactive web-based map that visually represents house prices across King County. Each house is shown as a colored, semi-transparent circle: Larger circles represent more expensive homes. Brighter colors correspond to higher price quantiles. Tooltips display key home information when the user hovers over a marker.