Cloud Application Development

Phase 3: Project Development Part 1

Project title:

Machine learning model deployment with IBM cloud Watson Studio.

Problem Statement:

Become a wizard of predictive analytics with IBM Cloud Watson Studio. Train machine learning models to predict the outcomes in real time. Deploy the models as web services and integrate them into your applications. Unlock the magic of data driven insights and make informed decisions like never before.

House Price Prediction Analysis - Part 1

- Project overview
- Data Understanding
- Data Visualization
- Data Preparation
- Modeling
- Evaluation

Project Overview:

House Price Prediction Analysis aims to use Machine learning analysis algorithms to predict the price of houses based on their features like number of rooms, number of bedrooms, age of the house, population of the respective area where the house is located, location of the house and the area income with other relevant factors if available. By this Machine Learning model user can predict the price of the house that can be sold.

Data Understanding:

Data analysis is the process of inspecting, cleaning, transforming, and modeling data to uncover useful information, draw conclusions, and support decision-making.

- Data visualization
- Exploratory Data Analysis

Data Visualization:

Data visualization plays a crucial role in understanding the data, identifying trends, and communicating insights.

- Histograms and Distributions

- Scatter Plots
- Correlation Matrix
- Box Plots
- Time Series Plots
- Geospatial Visualization
- Feature Importance Plot
- Residual Plots
- Interactive Dashboards
- Comparison Charts

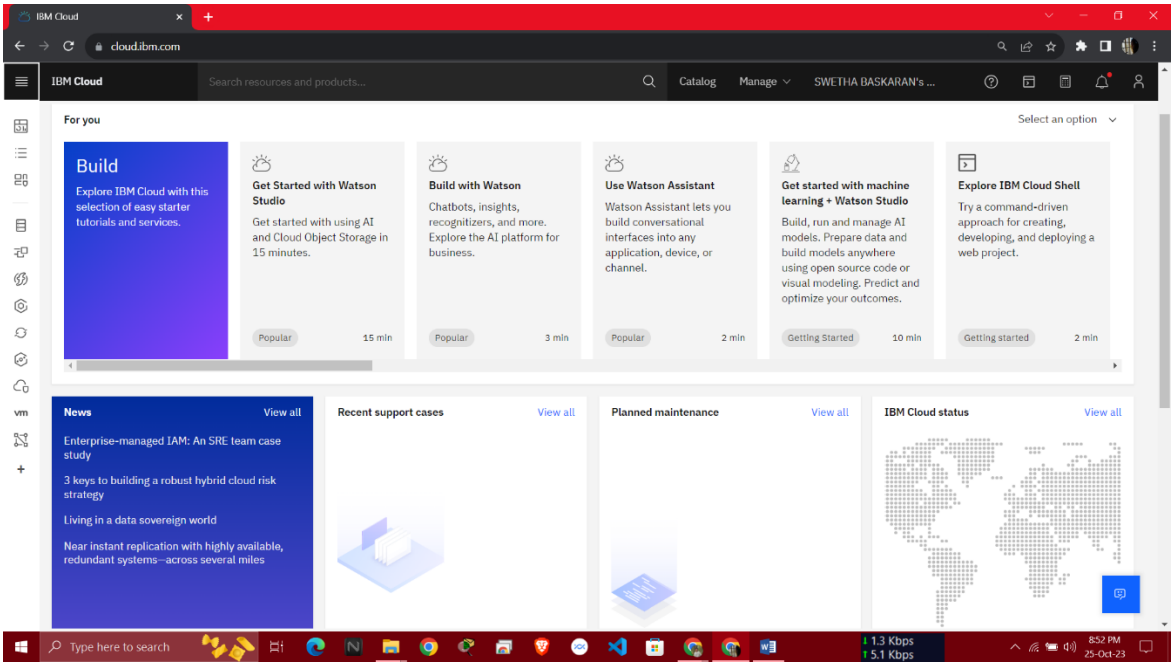
Data Preparation:

1. Data Cleaning:
    - Handle missing data.
    - Address outliers.
2. Feature Engineering:
    - Create relevant new features.
    - Encode categorical variables.
    - Scale or normalize numerical features.
3. Data Splitting:
    - Split the data into training, validation, and test sets.
4. Normalization.
5. Feature Selection.
6. Documentation:
    - Keep records of data preparation steps for reproducibility.

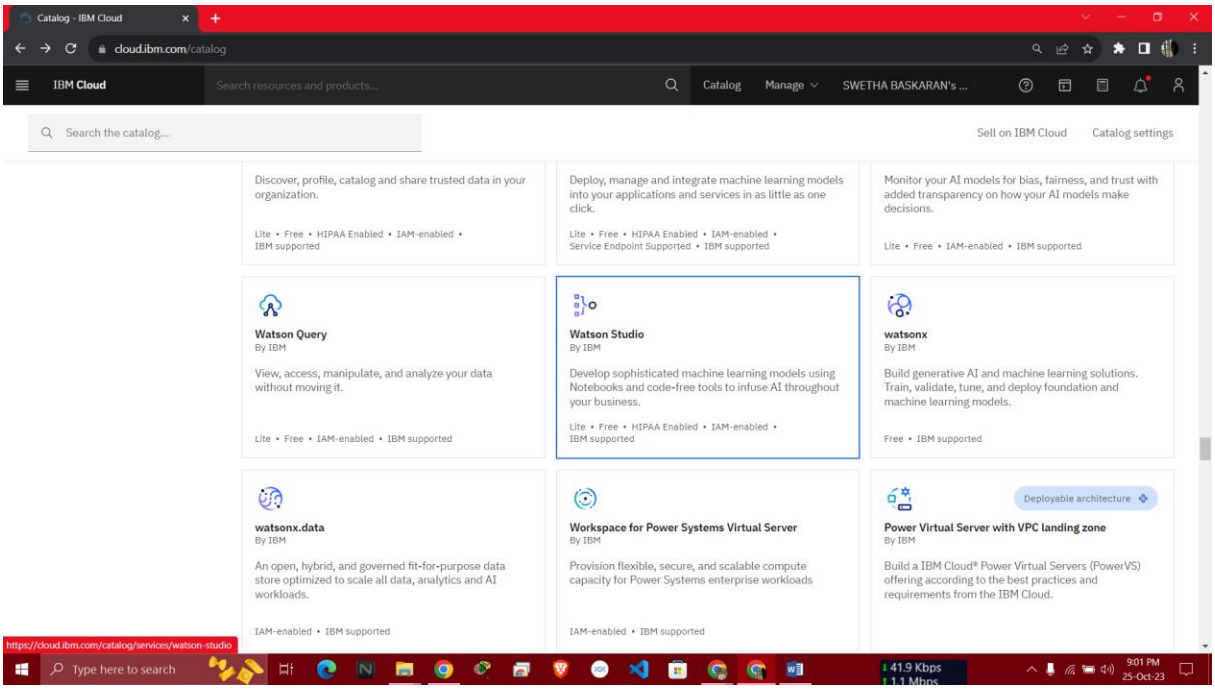
Modeling and Evaluation:

Step wise process for the House Price Prediction Analysis Machine learning model deployment.

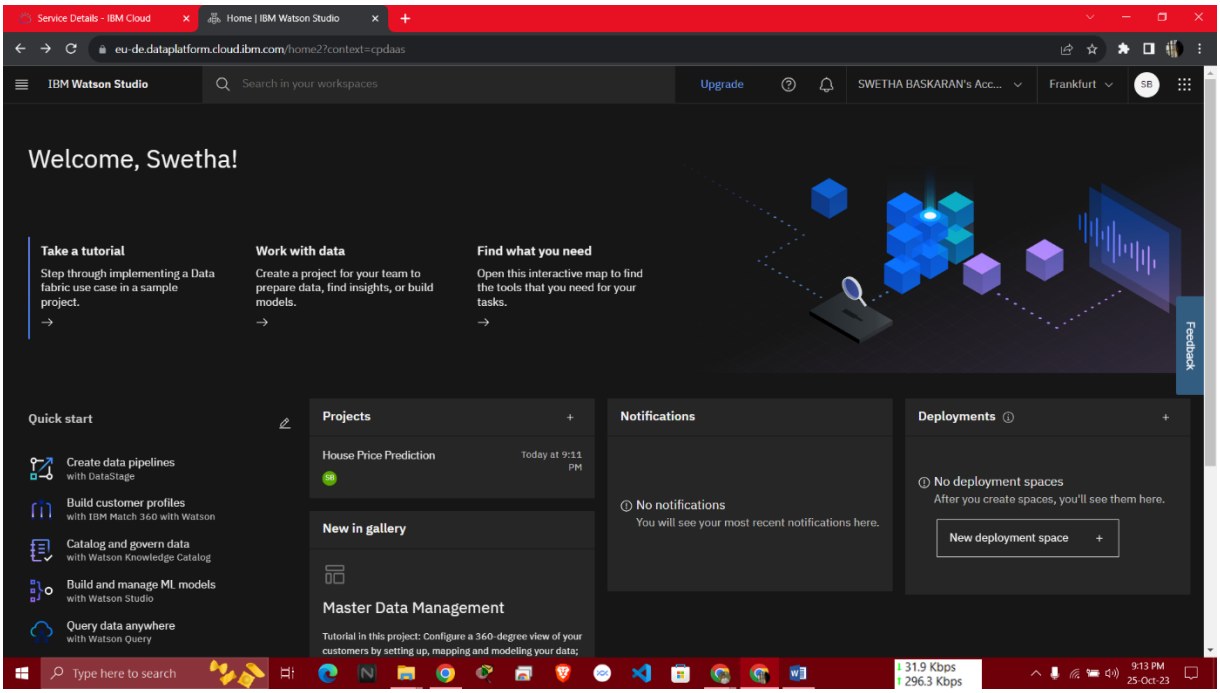
Step 1: Login to IBM cloud



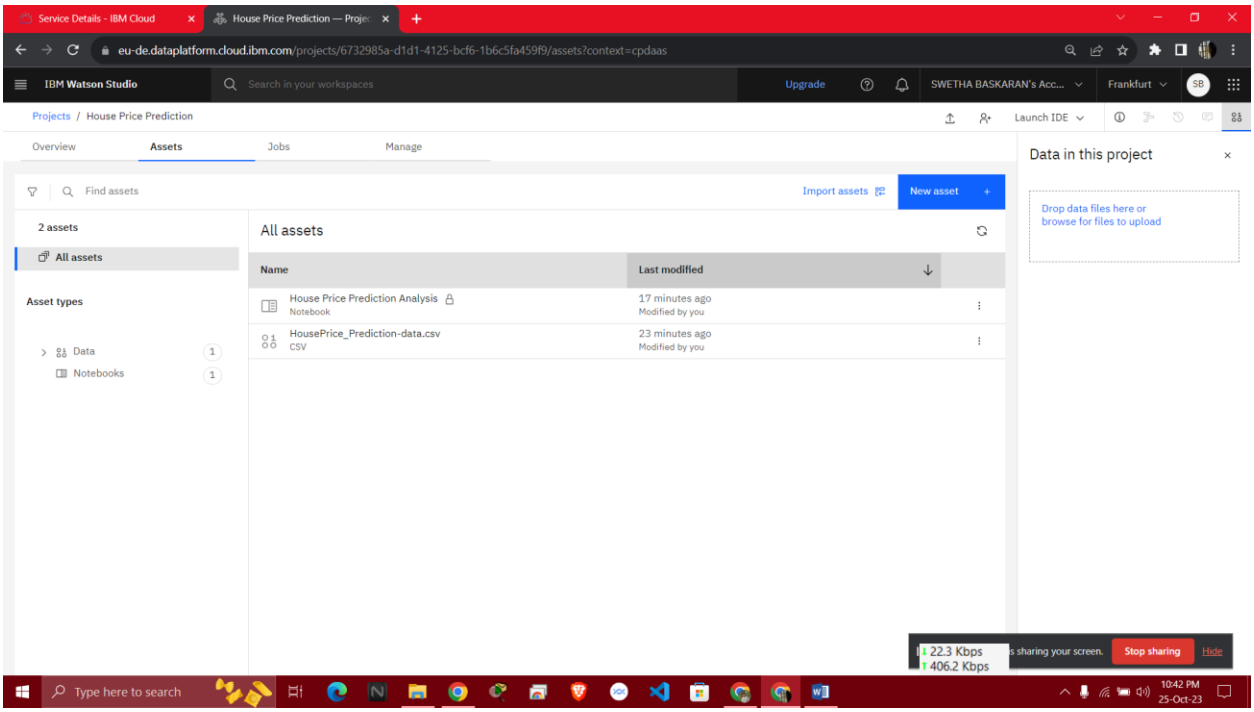
Step 2: Go to catalog and create a Watson Studio service in AI category.



Step 3: Get started to launch Watson Studio Dashboard.



Step 4: Create a project in IBM Watson Studio in IBM Cloud and assign a Cloud object storage to manage datasets.

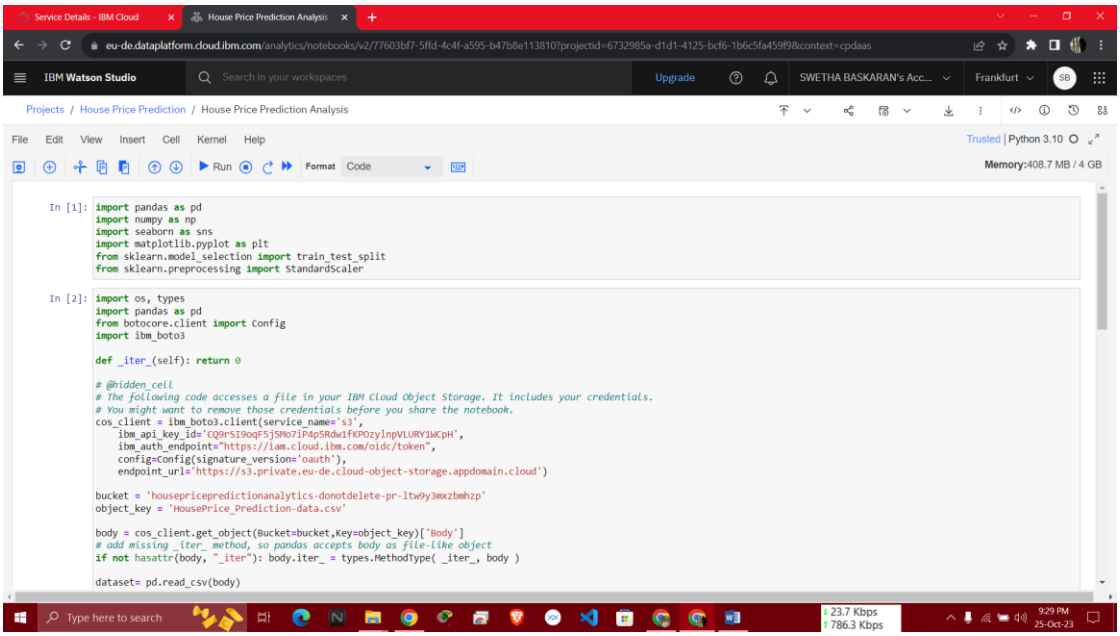


Cloud Object Storage is a storage service in IBM Cloud. We use this service to manage our datasets for training the ML Model and store required files.

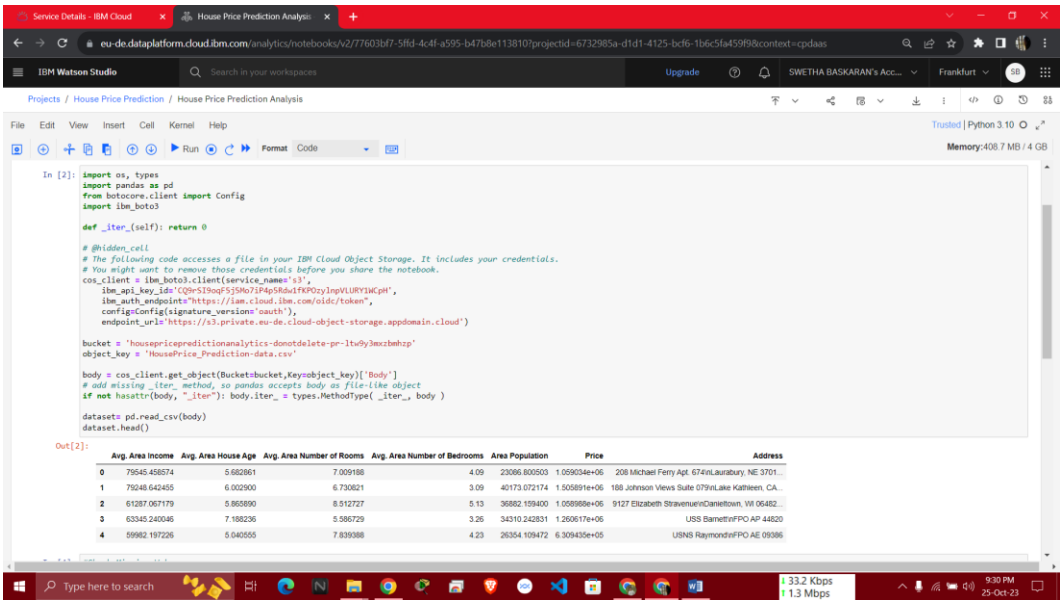
Step 5: Add a jupyter notebook instance in your project to Develop and Deploy Machine Learning Model.

i. Import necessary library packages.

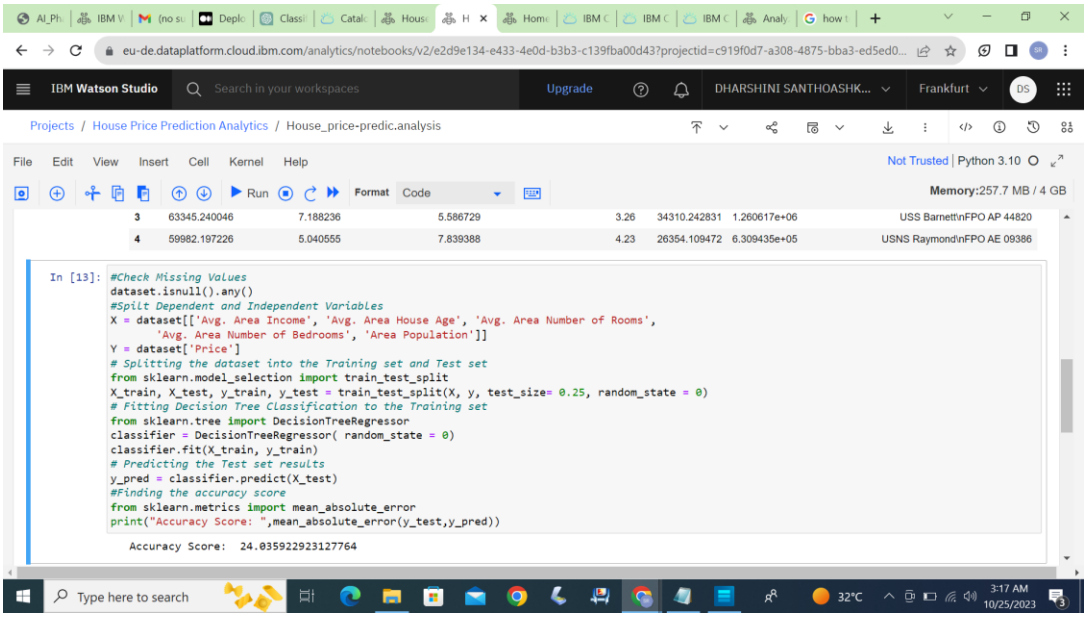
- import pandas as pd: For handling your dataset.
- import numpy as np: Useful for numerical operations.
- from sklearn.model_selection import train_test_split: Split your data into training and testing sets.
- import seaborn as sns: for data visualization in python.
- import matplotlib.pyplot as plt: another powerful library for creating visualizations.



ii. Import dataset and proceed further with pre-processing steps and build the model.



Step 6: Train the build model and evaluate them.



Model was build trained and tested.

Conclusion:

The housing price prediction project has successfully demonstrated the ability to forecast real estate prices with a reasonable degree of accuracy. Through the utilization of machine learning algorithms and a robust dataset, this project has provided valuable insights into factors influencing housing prices. It can serve as a valuable tool for both prospective homebuyers and real estate professionals seeking to make informed decisions in the dynamic housing market. However, it's important to acknowledge that market conditions can change over time, and ongoing model updates and data monitoring are essential to maintain predictive accuracy.