Project Name:

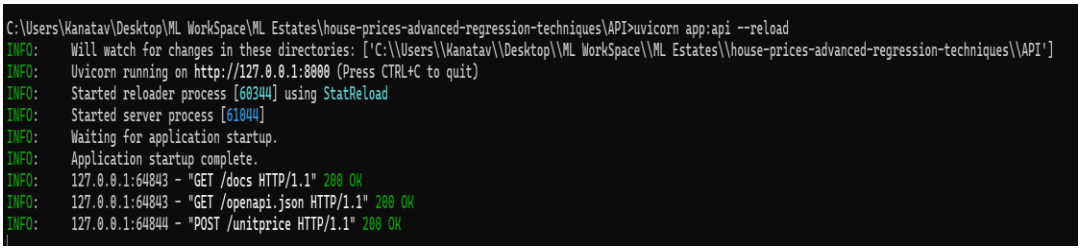
Real Estate Machine Learning Pricing Model

Week 3

3-31-2024

API Implementation & Instruction

After we test and build the model from previous weeks' progress. This week we used the FastAPI to build a simple API allows consumers to interact with our team's ML models. After creating the API through FASTAPI, you may access our modeling with following steps:

1. Download API.zip onto the computer
2. Locate or move the extracted file folder to location of your choice
3. Command prompt
    a. Windows: Windows+R
    b. Then enter
4. After command prompt enter the following code: cd "your file location"
    a. You may paste your file location after cd . (space is needed)
5. Then enter: uvicorn app:api –reload
    a. Prior to this steps, make sure your python environment is correct
        i. Pip install
            1. Uvicorn
            2. Pytest
            3. Joblib
            4. Pydantic
            5. Typing
            6. Fastapi
            7. Testclient
6. Then you can interact with our model by entering http://127.0.0.1:8000/docs in your website
    a. Proof of successful interactions:
    b. 

c.

```
    import row.json
E   ModuleNotFoundError: No module named 'row'
=========================== short test summary info ===========================
ERROR test_app.py
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! Interrupted: 1 error during collection !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
=============================== 1 error in 1.20s ==============================

C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API>pytest
============================= test session starts =============================
platform win32 -- Python 3.12.0, pytest-8.1.1, pluggy-1.4.0
rootdir: C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API
plugins: anyio-3.7.1, dash-2.14.1
collected 1 item

test_app.py .                                                            [100%]

============================== warnings summary ===============================
test_app.py::test_read_unitprice
  C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API\app.py:102: PydanticDeprecatedSince20: The `dict` method is deprecated; use `model_dump` instead. Deprecated in
 Pydantic V2.0 to be removed in V3.0. See Pydantic V2 Migration Guide at https://errors.pydantic.dev/2.5/migration/
    features_dict = house_features.dict(by_alias=True)

test_app.py::test_read_unitprice
  C:\Users\Kanatav\AppData\Local\Programs\Python\Python312\Lib\site-packages\pydantic\main.py:979: PydanticDeprecatedSince20: The `dict` method is deprecated; use `model_dump` instead. Deprecated in Pydantic V2
.0 to be removed in V3.0. See Pydantic V2 Migration Guide at https://errors.pydantic.dev/2.5/migration/
    warnings.warn('The `dict` method is deprecated; use `model_dump` instead.', DeprecationWarning)

-- Docs: https://docs.pytest.org/en/stable/how-to/capture-warnings.html
======================== 1 passed, 2 warnings in 1.12s ========================

C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API>pytest
============================= test session starts =============================
platform win32 -- Python 3.12.0, pytest-8.1.1, pluggy-1.4.0
rootdir: C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API
plugins: anyio-3.7.1, dash-2.14.1
collected 1 item

test_app.py .                                                            [100%]

============================== 1 passed in 1.20s ==============================

C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API>pytest
============================= test session starts =============================
platform win32 -- Python 3.12.0, pytest-8.1.1, pluggy-1.4.0
rootdir: C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API
plugins: anyio-3.7.1, dash-2.14.1
collected 1 item

test_app.py .                                                            [100%]

============================== 1 passed in 1.18s ==============================

C:\Users\Kanatav\Desktop\ML WorkSpace\ML Estates\house-prices-advanced-regression-techniques\API>
```

7. Since the API interaction portal only accept json files. We will need a sample data without the column ‘Sale Price’, any row of the data set that is transformed into a json format like below:

a.

Request body required — application/json

```
{
  "MSSubClass": 0,
  "MSZoning": "string",
  "LotFrontage": 0,
  "LotArea": 0,
  "Street": "string",
  "Alley": "string",
  "LotShape": "string",
  "LandContour": "string",
  "Utilities": "string",
  "LotConfig": "string",
  "LandSlope": "string",
  "Neighborhood": "string",
  "Condition1": "string",
  "Condition2": "string",
  "BldgType": "string",
  "HouseStyle": "string",
  "OverallQual": 0,
  "OverallCond": 0,
  "YearBuilt": 0,
  "YearRemodAdd": 0,
  "RoofStyle": "string",
  "RoofMatl": "string",
  "Exterior1st": "string",
  "Exterior2nd": "string",
  "MasVnrType": "string",
  "MasVnrArea": 0,
  "ExterQual": "string",
  "ExterCond": "string",
  "Foundation": "string",
  "BsmtQual": "string",
  "BsmtCond": "string",
  "BsmtExposure": "string",
  "BsmtFinType1": "string",
  "BsmtFinSF1": 0,
  "BsmtFinType2": "string",
  "BsmtFinSF2": 0,
  "BsmtUnfSF": 0,
  "TotalBsmtSF": 0,
  "Heating": "string",
  "HeatingQC": "string",
  "CentralAir": "string",
  "Electrical": "string",
  "1stFlrSF": 0,
  "2ndFlrSF": 0,
  "LowQualFinSF": 0,
  "GrLivArea": 0,
  "BsmtFullBath": 0,
  "BsmtHalfBath": 0,
  "FullBath": 0,
  "HalfBath": 0,
  "BedroomAbvGr": 0,
  "KitchenAbvGr": 0,
  "KitchenQual": "string",
  "TotRmsAbvGrd": 0,
  "Functional": "string",
  "Fireplaces": 0,
  "FireplaceQu": "string",
  "GarageType": "string",
  "GarageYrBlt": 0,
  "GarageFinish": "string",
  "GarageCars": 0,
  "GarageArea": 0,
  "GarageQual": "string",
  "GarageCond": "string",
  "PavedDrive": "string",
  "WoodDeckSF": 0,
  "OpenPorchSF": 0,
  "EnclosedPorch": 0,
  "3SsnPorch": 0,
  "ScreenPorch": 0,
  "PoolArea": 0,
  "PoolQC": "string",
  "Fence": "string",
  "MiscFeature": "string",
  "MiscVal": 0,
  "MoSold": 0,
  "YrSold": 0,
  "SaleType": "string",
  "SaleCondition": "string"
}
```

8. Paste the sample row data into the section, you will get following output

a.

We have tested both on the computer of someone who build the API and someone who have never interacted with API. At both locations, the outcome is successful upon following the instruction above. In the next few weeks, our team will think about ways to make it more conveniently for consumer to interact with and also on the aesthetic aspect, we will make it more tidy and clean.