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Section NO: BSAI-4B

import pandas as pd

df = pd.read\_csv("C:\\Users\\ZEESHAN\\Downloads\\home-data-for-ml-course\\train.csv", index\_col='Id')

df\_test = pd.read\_csv(r"C:\Users\ZEESHAN\Downloads\home-data-for-ml-course\test.csv")

print(df\_test.head())

df.head()

df.columns

df.info()

print(type(df\_test))

iid=df\_test['Id']

X\_fin\_tech=df\_test.drop(columns=['Id'])

categorical\_features = ['MSZoning', 'Street', 'Alley', 'LotShape', 'LandContour', 'Utilities', 'LotConfig', 'LandSlope', 'Neighborhood', 'Condition1', 'Condition2', 'BldgType', 'HouseStyle', 'RoofStyle', 'RoofMatl', 'Exterior1st', 'Exterior2nd', 'MasVnrType', 'ExterQual', 'ExterCond', 'Foundation', 'BsmtQual', 'BsmtCond', 'BsmtExposure', 'BsmtFinType1', 'BsmtFinType2', 'Heating', 'HeatingQC', 'CentralAir', 'Electrical', 'KitchenQual', 'Functional', 'FireplaceQu', 'GarageType', 'GarageFinish', 'GarageQual', 'GarageCond', 'PavedDrive', 'PoolQC', 'Fence', 'MiscFeature', 'SaleType', 'SaleCondition']

for feature in categorical\_features:

df[feature] = df[feature].astype('category')

X\_fin\_tech[feature]=X\_fin\_tech[feature].astype('category')

y=df['SalePrice']

df.drop(columns=['SalePrice'],inplace=True)

X=df

from sklearn.model\_selection import train\_test\_split

X\_train,X\_test,y\_train,y\_test = train\_test\_split(X,y,test\_size=0.001)

import lightgbm as lgb

train\_data = lgb.Dataset(X\_train, label=y\_train)

test\_data = lgb.Dataset(X\_test, label=y\_test)

df.info()

params = {'n\_estimators': 693, 'max\_depth': 8, 'colsample\_bytree': 0.5075413041956253,

'subsample': 0.83306258044554, 'learning\_rate': 0.011639115298956882, 'min\_child\_samples': 23}

gbm = lgb.train(params,

train\_data,

num\_boost\_round=100,

valid\_sets=[train\_data, test\_data],

valid\_names=['train', 'eval'])

fin\_pred\_lgbm = gbm.predict(X\_fin\_tech)

fin\_pred\_lgbm

result\_df = pd.DataFrame({

'Id': iid,

'SalePrice': fin\_pred\_lgbm

})

result\_df.to\_csv('predictions\_lgbm.csv', index=False)

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**Explanation of code**

Loads data (training & test sets).

Explores dataset using .info(), .columns, .head().

Processes categorical features by converting them to category.

Splits data into features (X) and target (y).

Divides data into training and validation sets.

Prepares LightGBM dataset format.

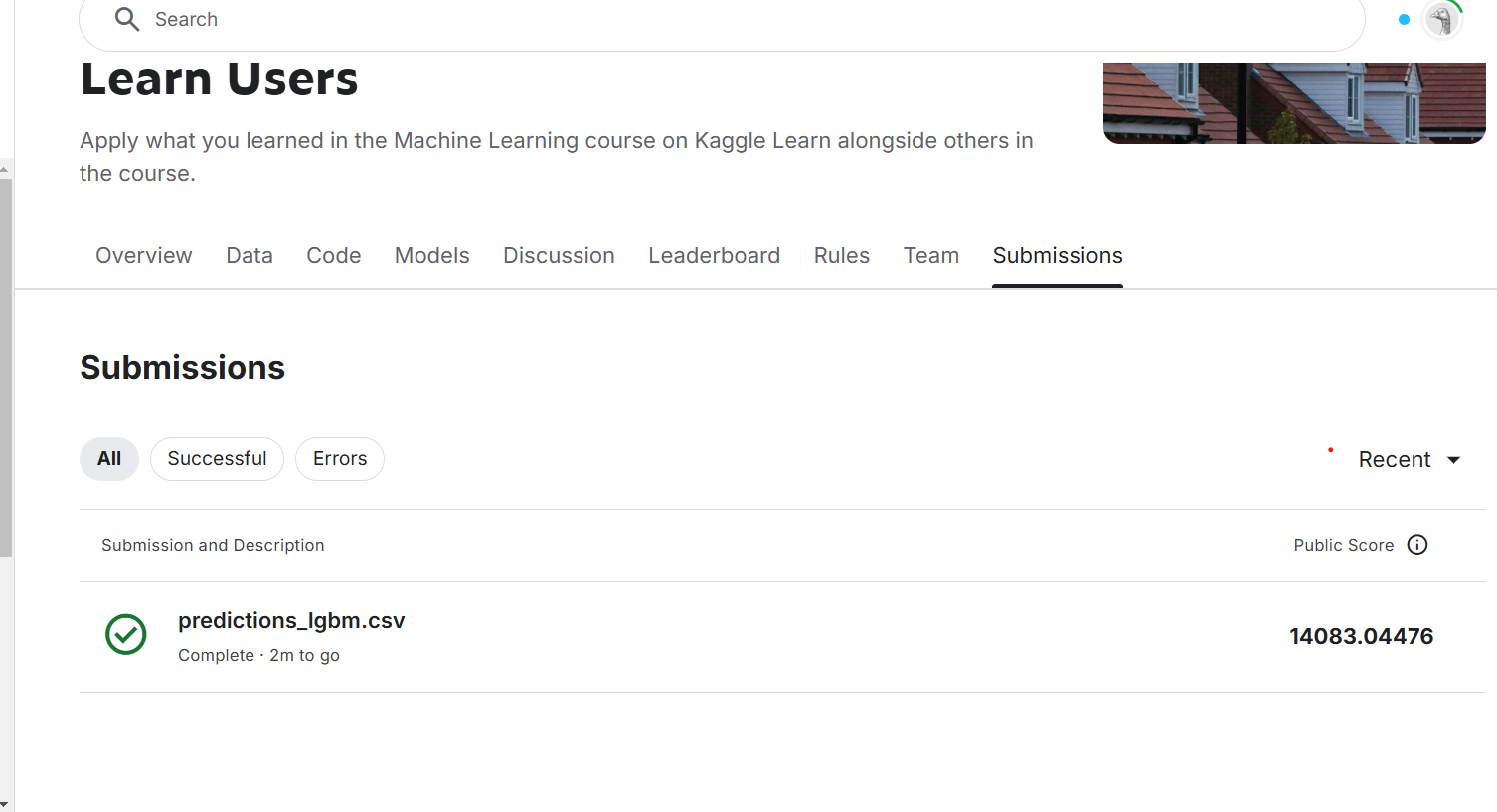
Defines model parameters for LightGBM.

Trains the model on the training data.

Predicts house prices using the trained model.

Saves predictions in a CSV file.

**Accuracy:**

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