ML Project

Team Members

Aya Elsheikh 20220096

Judy Mohamed 20220127

Bassmala Hossam 20220108

Logyne Ammar 20220354

Mennatuallah Haitham 20220508

Sara Emad 20220197

Overview

This document outlines the details of our machine learning project focused on two different datasets: one for flower species classification and another for house price prediction.

This project implements various algorithms, including logistic, KNN (K-Nearest Neighbors) as classifiers, KNN and multiple linear as regressors.

Datasets

Flower Species Classification

- Source: Flowers Recognition Dataset
- Description: This dataset contains images of different flower species, specifically 5 classes: Daisy, Dandelion, Rose, Sunflower, and Tulip.
- Labels: The labels correspond to the species of the flowers.
- Missing Values: No missing values are present in the dataset, as it consists of images organized in directories by class.
- test size : 20%

House Prices Prediction

- Source: House Prices Regression Dataset
- Description: This dataset includes various features related to houses, such as square footage, number of bedrooms, and location, aimed at predicting house prices.
- Labels: The target variable is the house price.
- Missing Values: The dataset contains some missing values in certain features, which were handled using imputation techniques.
- test size : 30%

Applied Algorithms

Flower Species Recognition

Logistic Regression	• To classify the flower species based on extracted features from the images. • Features were extracted using image processing techniques, and logistic regression was applied to predict the flower species.
K-Nearest Neighbors (KNN)	• To classify the flower species using the KNN algorithm. • The classifier was trained on the same feature set used for logistic regression, with hyperparameter tuning for optimal performance.

House Price Prediction

Multiple Linear Regression	• This model was built using the relevant features, and the coefficients were estimated through ordinary least squares.
KNN Regression	• This model used the distance to the nearest neighbors to predict the target variable.

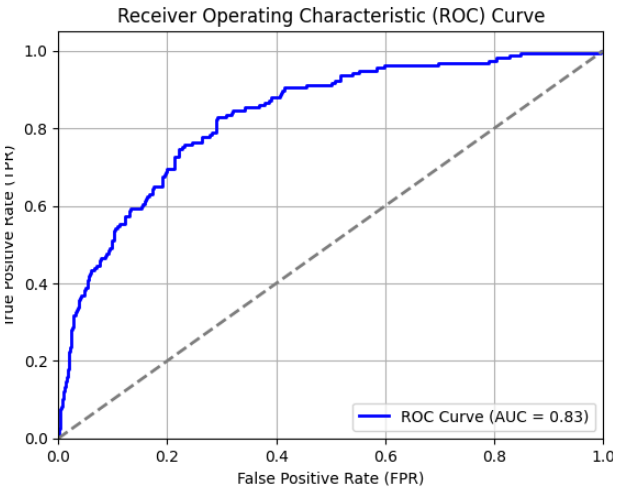
House price prediction

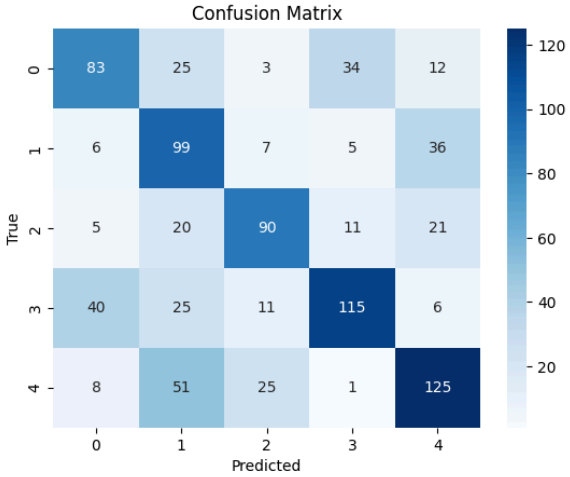
Algorithm	MSE	MAE	R2
Multiple Linear Regression	67306371797.759	168580.418	0.5097
KNN	39544138199.646	96741.654	0.7384

Flower species recognition

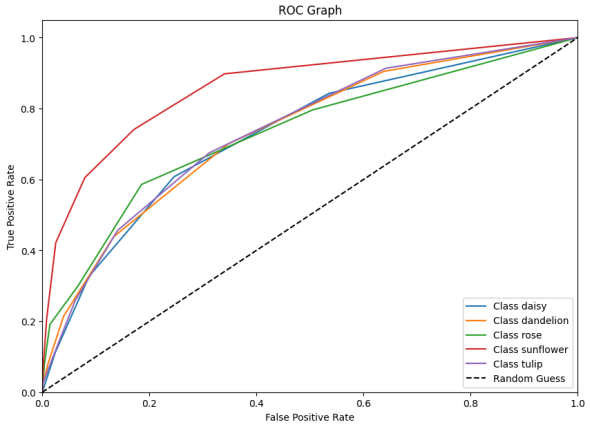
Algorithm	Accuracy	Loss curve
Logistic	57%	1.2860
KNN	48.50%	5.3872

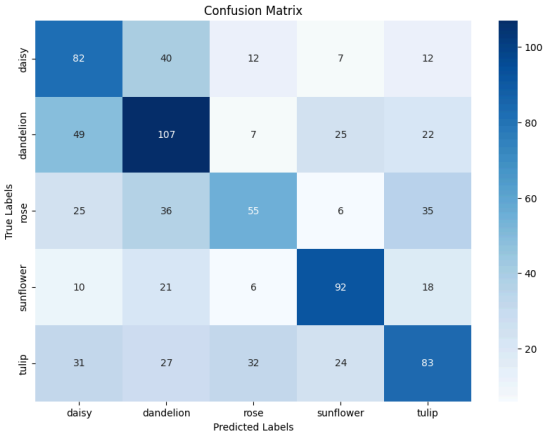
Logisiic graphs





KNN graphs




Confusion Matrix
True Labels
Predicted Labels
daisy
dandelion
rose
sunflower
tulip
82 40 12 7 12
49 107 7 25 22
25 36 55 6 35
10 21 6 92 18
31 27 32 24 83
100
80
60
40
20