

## Replication

The results were produced on a local machine

System Specifications:

Operating System: Microsoft Windows 10 Pro

Processor: Intel Core i5-12400F

Memory: 32GB

Python Version 3.13.2 64bit

Results were generated with the following parameter settings:

**Polynomial Feature Expansion Enabled:** `'preprocess_data(data, add_poly=True)'`

**Degree 2 Polynomials Used:** `'PolynomialFeatures(degree=2, include_bias=False)'`

**Hyperparameter Options:** `'param_grid = {'n_estimators': [50, 100, 150], 'learning_rate': [0.05, 0.1, 0.2], 'max_depth': [3, 4, 5]}'`

**k-Fold Cross-Validation with 5 folds:** `'evaluate_model(model, X, y, cv_folds=5)'`

**k-Fold random state set to 42:** `'kf = KFold(n_splits=cv_folds, shuffle=True, random_state=42)'`

**Seed:** `'base_random_seed = 1'`