**TASK 1**

**DecisionTree**

Parameter: criterion = entropy, max\_depth = 2; Accuracy: 0.6176470588235294

Parameter: criterion = entropy, max\_depth = 3; Accuracy: 0.6176470588235294

Parameter: criterion = entropy, max\_depth = 4; Accuracy: 0.6470588235294118

Parameter: criterion = entropy, max\_depth = 5; Accuracy: 0.5882352941176471

Parameter: criterion = entropy, max\_depth = 6; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 7; Accuracy: 0.6764705882352942

Parameter: criterion = entropy, max\_depth = 8; Accuracy: 0.6470588235294118

Parameter: criterion = entropy, max\_depth = 9; Accuracy: 0.6176470588235294

Parameter: criterion = entropy, max\_depth = 10; Accuracy: 0.6323529411764706

Parameter: criterion = entropy, max\_depth = 11; Accuracy: 0.5882352941176471

Parameter: criterion = entropy, max\_depth = 12; Accuracy: 0.5882352941176471

Parameter: criterion = entropy, max\_depth = 13; Accuracy: 0.6764705882352942

Parameter: criterion = entropy, max\_depth = 14; Accuracy: 0.5588235294117647

Parameter: criterion = entropy, max\_depth = 15; Accuracy: 0.5882352941176471

Parameter: criterion = entropy, max\_depth = 16; Accuracy: 0.6323529411764706

Parameter: criterion = entropy, max\_depth = 17; Accuracy: 0.6323529411764706

Parameter: criterion = entropy, max\_depth = 18; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 19; Accuracy: 0.6470588235294118

Parameter: criterion = entropy, max\_depth = 20; Accuracy: 0.6764705882352942

Parameter: criterion = gini, max\_depth = 2; Accuracy: 0.6617647058823529

Parameter: criterion = gini, max\_depth = 3; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 4; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 5; Accuracy: 0.6323529411764706

Parameter: criterion = gini, max\_depth = 6; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 7; Accuracy: 0.6911764705882353

Parameter: criterion = gini, max\_depth = 8; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 9; Accuracy: 0.7058823529411765

Parameter: criterion = gini, max\_depth = 10; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 11; Accuracy: 0.6764705882352942

Parameter: criterion = gini, max\_depth = 12; Accuracy: 0.6617647058823529

Parameter: criterion = gini, max\_depth = 13; Accuracy: 0.6617647058823529

Parameter: criterion = gini, max\_depth = 14; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 15; Accuracy: 0.6911764705882353

Parameter: criterion = gini, max\_depth = 16; Accuracy: 0.6323529411764706

Parameter: criterion = gini, max\_depth = 17; Accuracy: 0.6911764705882353

Parameter: criterion = gini, max\_depth = 18; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 19; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 20; Accuracy: 0.6764705882352942

Criterion: gini , max\_depth: 9

Accuracy: **0.582089552238806**

**RandomForest**

Parameter: criterion = entropy, max\_depth = 2; Accuracy: 0.23529411764705882

Parameter: criterion = entropy, max\_depth = 3; Accuracy: 0.4117647058823529

Parameter: criterion = entropy, max\_depth = 4; Accuracy: 0.6029411764705882

Parameter: criterion = entropy, max\_depth = 5; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 6; Accuracy: 0.6911764705882353

Parameter: criterion = entropy, max\_depth = 7; Accuracy: 0.7058823529411765

Parameter: criterion = entropy, max\_depth = 8; Accuracy: 0.7352941176470589

Parameter: criterion = entropy, max\_depth = 9; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 10; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 11; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 12; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 13; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 14; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 15; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 16; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 17; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 18; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 19; Accuracy: 0.6617647058823529

Parameter: criterion = entropy, max\_depth = 20; Accuracy: 0.6617647058823529

Parameter: criterion = gini, max\_depth = 2; Accuracy: 0.27941176470588236

Parameter: criterion = gini, max\_depth = 3; Accuracy: 0.3088235294117647

Parameter: criterion = gini, max\_depth = 4; Accuracy: 0.45588235294117646

Parameter: criterion = gini, max\_depth = 5; Accuracy: 0.5294117647058824

Parameter: criterion = gini, max\_depth = 6; Accuracy: 0.6470588235294118

Parameter: criterion = gini, max\_depth = 7; Accuracy: 0.6617647058823529

Parameter: criterion = gini, max\_depth = 8; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 9; Accuracy: 0.7352941176470589

Parameter: criterion = gini, max\_depth = 10; Accuracy: 0.7058823529411765

Parameter: criterion = gini, max\_depth = 11; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 12; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 13; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 14; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 15; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 16; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 17; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 18; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 19; Accuracy: 0.7205882352941176

Parameter: criterion = gini, max\_depth = 20; Accuracy: 0.7205882352941176

Criterion: gini , max\_depth: 9

Accuracy: **0.6567164179104478**

**LogisticRegression**

Parameter: criterion = liblinear; Accuracy: 0.75

Parameter: criterion = newton-cg; Accuracy: 0.7647058823529411

Parameter: criterion = lbfgs; Accuracy: 0.7794117647058824

Parameter: criterion = sag; Accuracy: 0.38235294117647056

Parameter: criterion = saga; Accuracy: 0.3088235294117647

Criterion: lbfgs

Accuracy: **0.7611940298507462**

**SVM**

Parameter: kernel =, gamma =; Accuracy: 0.29411764705882354

Parameter: kernel = linear, gamma = scale; Accuracy: 0.75

Parameter: kernel = linear, gamma = auto; Accuracy: 0.75

Parameter: kernel = poly, gamma = scale; Accuracy: 0.7058823529411765

Parameter: kernel = poly, gamma = auto; Accuracy: 0.7058823529411765

Parameter: kernel = rbf, gamma = scale; Accuracy: 0.75

Parameter: kernel = rbf, gamma = auto; Accuracy: 0.75

Parameter: kernel = sigmoid, gamma = scale; Accuracy: 0.1323529411764706

Parameter: kernel = sigmoid, gamma = auto; Accuracy: 0.14705882352941177

Kernel: rbf, gamma: auto

Accuracy: **0.6865671641791045**

**TASK 2**

**SGD Regression**

Parameter: loss = squared\_loss, penalty: None; Accuracy: -5.091509261007203e+28

Parameter: loss = squared\_loss, penalty: l2; Accuracy: -2.4253426860349372e+29

Parameter: loss = squared\_loss, penalty: l1; Accuracy: -3.0040625982906932e+29

Parameter: loss = squared\_loss, penalty: elasticnet; Accuracy: -1.534806866304369e+30

Parameter: loss = huber, penalty: None; Accuracy: -24.700671311478608

Parameter: loss = huber, penalty: l2; Accuracy: -2705.258102455163

Parameter: loss = huber, penalty: l1; Accuracy: -45.81865699470415

Parameter: loss = huber, penalty: elasticnet; Accuracy: -133.48080759671086

Parameter: loss = epsilon\_insensitive, penalty: None; Accuracy: -130226.0932957513

Parameter: loss = epsilon\_insensitive, penalty: l2; Accuracy: -124016.66196806393

Parameter: loss = epsilon\_insensitive, penalty: l1; Accuracy: -58417.94421150235

Parameter: loss = epsilon\_insensitive, penalty: elasticnet; Accuracy: -170339.13490815216

Parameter: loss = squared\_epsilon\_insensitive, penalty: None; Accuracy: -4.672781841031589e+28

Parameter: loss = squared\_epsilon\_insensitive, penalty: l2; Accuracy: -1.2294991439548556e+29

Parameter: loss = squared\_epsilon\_insensitive, penalty: l1; Accuracy: -3.674359630826451e+28

Parameter: loss = squared\_epsilon\_insensitive, penalty: elasticnet; Accuracy: -4.960526636852749e+29

SGDRegressor // Parameter: loss = , penalty:

**Ridge Regression**

Parameter: solver = auto, max\_iter: 1000; Accuracy: 0.7597355908779901

Parameter: solver = auto, max\_iter: 2000; Accuracy: 0.7597355908779901

Parameter: solver = auto, max\_iter: 5000; Accuracy: 0.7597355908779901

Parameter: solver = auto, max\_iter: 10000; Accuracy: 0.7597355908779901

Parameter: solver = svd, max\_iter: 1000; Accuracy: 0.7597355908779903

Parameter: solver = svd, max\_iter: 2000; Accuracy: 0.7597355908779903

Parameter: solver = svd, max\_iter: 5000; Accuracy: 0.7597355908779903

Parameter: solver = svd, max\_iter: 10000; Accuracy: 0.7597355908779903

Parameter: solver = cholesky, max\_iter: 1000; Accuracy: 0.7597355908779901

Parameter: solver = cholesky, max\_iter: 2000; Accuracy: 0.7597355908779901

Parameter: solver = cholesky, max\_iter: 5000; Accuracy: 0.7597355908779901

Parameter: solver = cholesky, max\_iter: 10000; Accuracy: 0.7597355908779901

Parameter: solver = lsqr, max\_iter: 1000; Accuracy: 0.7539332694001895

Parameter: solver = lsqr, max\_iter: 2000; Accuracy: 0.7539332694001895

Parameter: solver = lsqr, max\_iter: 5000; Accuracy: 0.7539332694001895

Parameter: solver = lsqr, max\_iter: 10000; Accuracy: 0.7539332694001895

Parameter: solver = sparse\_cg, max\_iter: 1000; Accuracy: 0.753933269391972

Parameter: solver = sparse\_cg, max\_iter: 2000; Accuracy: 0.753933269391972

Parameter: solver = sparse\_cg, max\_iter: 5000; Accuracy: 0.753933269391972

Parameter: solver = sparse\_cg, max\_iter: 10000; Accuracy: 0.753933269391972

Ridge regression // Parameter: solver = svd, max\_iter: 10000

Accuracy: **0.7143324760263137**