################################################################################

Fitting: LogisticRegression(C=1.0, class\_weight=None, dual=False, fit\_intercept=True,

intercept\_scaling=1, l1\_ratio=None, max\_iter=100,

multi\_class='auto', n\_jobs=None, penalty='l2',

random\_state=42, solver='lbfgs', tol=0.0001, verbose=0,

warm\_start=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

/usr/local/lib/python3.7/dist-packages/sklearn/externals/six.py:31: FutureWarning: The module is deprecated in version 0.21 and will be removed in version 0.23 since we've dropped support for Python 2.7. Please rely on the official version of six (<https://pypi.org/project/six/>).

"(<https://pypi.org/project/six/>).", FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:144: FutureWarning: The sklearn.neighbors.base module is deprecated in version 0.22 and will be removed in version 0.24. The corresponding classes / functions should instead be imported from sklearn.neighbors. Anything that cannot be imported from sklearn.neighbors is now part of the private API.

warnings.warn(message, FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 34.4s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 1.9min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 4.8min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 5.7min finished

Best parameters:

{'C': 926.300878513349, 'class\_weight': 'balanced', 'fit\_intercept': True, 'max\_iter': 10000, 'multi\_class': 'multinomial', 'solver': 'lbfgs'}

Summary on test set:

Model: LogisticRegression

##################################################

accuracy : 0.77477 (0.00000)

f1\_macro : 0.69371 (0.00000)

f1\_micro : 0.77477 (0.00000)

f1\_weighted : 0.78676 (0.00000)

kappa : 0.69509 (0.00000)

precision\_macro : 0.68322 (0.00000)

precision\_micro : 0.77477 (0.00000)

precision\_weighted : 0.81069 (0.00000)

recall\_macro : 0.75434 (0.00000)

recall\_micro : 0.77477 (0.00000)

recall\_weighted : 0.77477 (0.00000)

################################################################################

Fitting: RandomForestClassifier(bootstrap=True, ccp\_alpha=0.0, class\_weight=None,

criterion='gini', max\_depth=None, max\_features='auto',

max\_leaf\_nodes=None, max\_samples=None,

min\_impurity\_decrease=0.0, min\_impurity\_split=None,

min\_samples\_leaf=1, min\_samples\_split=2,

min\_weight\_fraction\_leaf=0.0, n\_estimators=100,

n\_jobs=None, oob\_score=False, random\_state=42, verbose=0,

warm\_start=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 10.7s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 1.1min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 3.3min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 3.6min finished

Best parameters:

{'class\_weight': 'balanced\_subsample', 'criterion': 'entropy', 'max\_features': 'sqrt', 'min\_samples\_split': 0.007066305219717406, 'n\_estimators': 98}

Summary on test set:

Model: RandomForestClassifier

##################################################

accuracy : 0.85586 (0.00000)

f1\_macro : 0.79292 (0.00000)

f1\_micro : 0.85586 (0.00000)

f1\_weighted : 0.85547 (0.00000)

kappa : 0.80201 (0.00000)

precision\_macro : 0.78611 (0.00000)

precision\_micro : 0.85586 (0.00000)

precision\_weighted : 0.86090 (0.00000)

recall\_macro : 0.80465 (0.00000)

recall\_micro : 0.85586 (0.00000)

recall\_weighted : 0.85586 (0.00000)

################################################################################

Fitting: MLPClassifier(activation='relu', alpha=0.0001, batch\_size='auto', beta\_1=0.9,

beta\_2=0.999, early\_stopping=False, epsilon=1e-08,

hidden\_layer\_sizes=(100,), learning\_rate='constant',

learning\_rate\_init=0.001, max\_fun=15000, max\_iter=200,

momentum=0.9, n\_iter\_no\_change=10, nesterovs\_momentum=True,

power\_t=0.5, random\_state=42, shuffle=True, solver='adam',

tol=0.0001, validation\_fraction=0.1, verbose=False,

warm\_start=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 45.5s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 5.6min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 14.0min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 16.5min finished

/usr/local/lib/python3.7/dist-packages/sklearn/neural\_network/\_multilayer\_perceptron.py:571: ConvergenceWarning: Stochastic Optimizer: Maximum iterations (123) reached and the optimization hasn't converged yet.

% self.max\_iter, ConvergenceWarning)

Best parameters:

{'activation': 'relu', 'alpha': 0.017436642900499146, 'batch\_size': 32, 'hidden\_layer\_sizes': (200,), 'learning\_rate': 'adaptive', 'learning\_rate\_init': 0.0001, 'max\_iter': 123, 'solver': 'adam'}

/usr/local/lib/python3.7/dist-packages/sklearn/neural\_network/\_multilayer\_perceptron.py:571: ConvergenceWarning: Stochastic Optimizer: Maximum iterations (123) reached and the optimization hasn't converged yet.

% self.max\_iter, ConvergenceWarning)

Summary on test set:

Model: MLPClassifier

##################################################

accuracy : 0.73874 (0.00000)

f1\_macro : 0.65388 (0.00000)

f1\_micro : 0.73874 (0.00000)

f1\_weighted : 0.77035 (0.00000)

kappa : 0.66016 (0.00000)

precision\_macro : 0.66520 (0.00000)

precision\_micro : 0.73874 (0.00000)

precision\_weighted : 0.84047 (0.00000)

recall\_macro : 0.73698 (0.00000)

recall\_micro : 0.73874 (0.00000)

recall\_weighted : 0.73874 (0.00000)

################################################################################

Fitting: LinearDiscriminantAnalysis(n\_components=None, priors=None, shrinkage=None,

solver='svd', store\_covariance=False, tol=0.0001)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 76 tasks | elapsed: 2.1s

[Parallel(n\_jobs=4)]: Done 376 tasks | elapsed: 9.8s

[Parallel(n\_jobs=4)]: Done 493 out of 500 | elapsed: 12.6s remaining: 0.2s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 12.7s finished

Best parameters:

{'n\_components': 3, 'solver': 'svd'}

Summary on test set:

Model: LinearDiscriminantAnalysis

##################################################

accuracy : 0.68468 (0.00000)

f1\_macro : 0.60295 (0.00000)

f1\_micro : 0.68468 (0.00000)

f1\_weighted : 0.71896 (0.00000)

kappa : 0.58740 (0.00000)

precision\_macro : 0.61827 (0.00000)

precision\_micro : 0.68468 (0.00000)

precision\_weighted : 0.77966 (0.00000)

recall\_macro : 0.67220 (0.00000)

recall\_micro : 0.68468 (0.00000)

recall\_weighted : 0.68468 (0.00000)

################################################################################

Fitting: GaussianNB(priors=None, var\_smoothing=1e-09)

Summary on test set:

Model: GaussianNB

##################################################

accuracy : 0.62162 (0.00000)

f1\_macro : 0.57034 (0.00000)

f1\_micro : 0.62162 (0.00000)

f1\_weighted : 0.61941 (0.00000)

kappa : 0.49682 (0.00000)

precision\_macro : 0.58582 (0.00000)

precision\_micro : 0.62162 (0.00000)

precision\_weighted : 0.69248 (0.00000)

recall\_macro : 0.63932 (0.00000)

recall\_micro : 0.62162 (0.00000)

recall\_weighted : 0.62162 (0.00000)

################################################################################

Fitting: MultinomialNB(alpha=1.0, class\_prior=None, fit\_prior=True)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 283 tasks | elapsed: 0.8s

[Parallel(n\_jobs=4)]: Done 493 out of 500 | elapsed: 1.2s remaining: 0.0s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 1.2s finished

Best parameters:

{'alpha': 0.0007787658410143283, 'fit\_prior': False}

Summary on test set:

Model: MultinomialNB

##################################################

accuracy : 0.70270 (0.00000)

f1\_macro : 0.61446 (0.00000)

f1\_micro : 0.70270 (0.00000)

f1\_weighted : 0.73523 (0.00000)

kappa : 0.61422 (0.00000)

precision\_macro : 0.62931 (0.00000)

precision\_micro : 0.70270 (0.00000)

precision\_weighted : 0.81296 (0.00000)

recall\_macro : 0.69908 (0.00000)

recall\_micro : 0.70270 (0.00000)

recall\_weighted : 0.70270 (0.00000)

################################################################################

Fitting: BernoulliNB(alpha=1.0, binarize=0.0, class\_prior=None, fit\_prior=True)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 280 tasks | elapsed: 1.3s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 2.2s finished

Best parameters:

{'alpha': 0.0007787658410143283, 'fit\_prior': False}

Summary on test set:

Model: BernoulliNB

##################################################

accuracy : 0.77477 (0.00000)

f1\_macro : 0.72706 (0.00000)

f1\_micro : 0.77477 (0.00000)

f1\_weighted : 0.77011 (0.00000)

kappa : 0.69873 (0.00000)

precision\_macro : 0.72052 (0.00000)

precision\_micro : 0.77477 (0.00000)

precision\_weighted : 0.81192 (0.00000)

recall\_macro : 0.77012 (0.00000)

recall\_micro : 0.77477 (0.00000)

recall\_weighted : 0.77477 (0.00000)

################################################################################

Fitting: KNeighborsClassifier(algorithm='auto', leaf\_size=30, metric='minkowski',

metric\_params=None, n\_jobs=None, n\_neighbors=5, p=2,

weights='uniform')

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 57 tasks | elapsed: 9.2s

[Parallel(n\_jobs=4)]: Done 247 tasks | elapsed: 35.9s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 1.3min finished

Best parameters:

{'algorithm': 'kd\_tree', 'n\_neighbors': 1, 'p': 1, 'weights': 'uniform'}

Summary on test set:

Model: KNeighborsClassifier

##################################################

accuracy : 0.81081 (0.00000)

f1\_macro : 0.73630 (0.00000)

f1\_micro : 0.81081 (0.00000)

f1\_weighted : 0.81301 (0.00000)

kappa : 0.74146 (0.00000)

precision\_macro : 0.71491 (0.00000)

precision\_micro : 0.81081 (0.00000)

precision\_weighted : 0.82063 (0.00000)

recall\_macro : 0.77012 (0.00000)

recall\_micro : 0.81081 (0.00000)

recall\_weighted : 0.81081 (0.00000)

################################################################################

Fitting: DecisionTreeClassifier(ccp\_alpha=0.0, class\_weight=None, criterion='gini',

max\_depth=None, max\_features=None, max\_leaf\_nodes=None,

min\_impurity\_decrease=0.0, min\_impurity\_split=None,

min\_samples\_leaf=1, min\_samples\_split=2,

min\_weight\_fraction\_leaf=0.0, presort='deprecated',

random\_state=42, splitter='best')

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 280 tasks | elapsed: 1.5s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 2.4s finished

Best parameters:

{'class\_weight': None, 'criterion': 'entropy', 'max\_features': 'sqrt', 'min\_samples\_split': 0.0007787658410143283, 'splitter': 'random'}

Summary on test set:

Model: DecisionTreeClassifier

##################################################

accuracy : 0.69369 (0.00000)

f1\_macro : 0.61634 (0.00000)

f1\_micro : 0.69369 (0.00000)

f1\_weighted : 0.70267 (0.00000)

kappa : 0.58668 (0.00000)

precision\_macro : 0.60190 (0.00000)

precision\_micro : 0.69369 (0.00000)

precision\_weighted : 0.72282 (0.00000)

recall\_macro : 0.67051 (0.00000)

recall\_micro : 0.69369 (0.00000)

recall\_weighted : 0.69369 (0.00000)

################################################################################

Fitting: SVC(C=1.0, break\_ties=False, cache\_size=200, class\_weight=None, coef0=0.0,

decision\_function\_shape='ovr', degree=3, gamma='scale', kernel='rbf',

max\_iter=-1, probability=True, random\_state=42, shrinking=True, tol=0.001,

verbose=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 24.6s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 2.1min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 5.4min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 6.1min finished

/usr/local/lib/python3.7/dist-packages/sklearn/svm/\_base.py:231: ConvergenceWarning: Solver terminated early (max\_iter=180). Consider pre-processing your data with StandardScaler or MinMaxScaler.

% self.max\_iter, ConvergenceWarning)

Best parameters:

{'C': 83.24526408004218, 'degree': 2, 'gamma': 0.7797658410143283, 'kernel': 'rbf', 'max\_iter': 180}

/usr/local/lib/python3.7/dist-packages/sklearn/svm/\_base.py:231: ConvergenceWarning: Solver terminated early (max\_iter=180). Consider pre-processing your data with StandardScaler or MinMaxScaler.

% self.max\_iter, ConvergenceWarning)

Summary on test set:

Model: SVC

##################################################

accuracy : 0.75676 (0.00000)

f1\_macro : 0.69803 (0.00000)

f1\_micro : 0.75676 (0.00000)

f1\_weighted : 0.75717 (0.00000)

kappa : 0.66774 (0.00000)

precision\_macro : 0.67538 (0.00000)

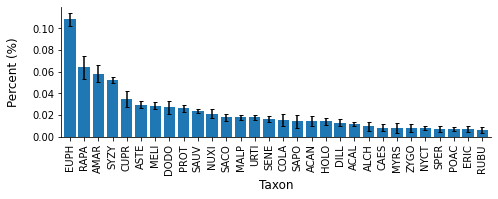
precision\_micro : 0.75676 (0.00000)

precision\_weighted : 0.76275 (0.00000)

recall\_macro : 0.73272 (0.00000)

recall\_micro : 0.75676 (0.00000)

recall\_weighted : 0.75676 (0.00000)



################################################################################

Fitting: LogisticRegression(C=1.0, class\_weight=None, dual=False, fit\_intercept=True,

intercept\_scaling=1, l1\_ratio=None, max\_iter=100,

multi\_class='auto', n\_jobs=None, penalty='l2',

random\_state=42, solver='lbfgs', tol=0.0001, verbose=0,

warm\_start=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

/usr/local/lib/python3.7/dist-packages/sklearn/externals/six.py:31: FutureWarning: The module is deprecated in version 0.21 and will be removed in version 0.23 since we've dropped support for Python 2.7. Please rely on the official version of six (<https://pypi.org/project/six/>).

"(<https://pypi.org/project/six/>).", FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:144: FutureWarning: The sklearn.neighbors.base module is deprecated in version 0.22 and will be removed in version 0.24. The corresponding classes / functions should instead be imported from sklearn.neighbors. Anything that cannot be imported from sklearn.neighbors is now part of the private API.

warnings.warn(message, FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

/usr/local/lib/python3.7/dist-packages/sklearn/utils/deprecation.py:87: FutureWarning: Function safe\_indexing is deprecated; safe\_indexing is deprecated in version 0.22 and will be removed in version 0.24.

warnings.warn(msg, category=FutureWarning)

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 34.4s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 1.9min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 4.8min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 5.7min finished

Best parameters:

{'C': 926.300878513349, 'class\_weight': 'balanced', 'fit\_intercept': True, 'max\_iter': 10000, 'multi\_class': 'multinomial', 'solver': 'lbfgs'}

Summary on test set:

Model: LogisticRegression

##################################################

accuracy : 0.77477 (0.00000)

f1\_macro : 0.69371 (0.00000)

f1\_micro : 0.77477 (0.00000)

f1\_weighted : 0.78676 (0.00000)

kappa : 0.69509 (0.00000)

precision\_macro : 0.68322 (0.00000)

precision\_micro : 0.77477 (0.00000)

precision\_weighted : 0.81069 (0.00000)

recall\_macro : 0.75434 (0.00000)

recall\_micro : 0.77477 (0.00000)

recall\_weighted : 0.77477 (0.00000)

################################################################################

Fitting: RandomForestClassifier(bootstrap=True, ccp\_alpha=0.0, class\_weight=None,

criterion='gini', max\_depth=None, max\_features='auto',

max\_leaf\_nodes=None, max\_samples=None,

min\_impurity\_decrease=0.0, min\_impurity\_split=None,

min\_samples\_leaf=1, min\_samples\_split=2,

min\_weight\_fraction\_leaf=0.0, n\_estimators=100,

n\_jobs=None, oob\_score=False, random\_state=42, verbose=0,

warm\_start=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 10.7s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 1.1min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 3.3min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 3.6min finished

Best parameters:

{'class\_weight': 'balanced\_subsample', 'criterion': 'entropy', 'max\_features': 'sqrt', 'min\_samples\_split': 0.007066305219717406, 'n\_estimators': 98}

Summary on test set:

Model: RandomForestClassifier

##################################################

accuracy : 0.85586 (0.00000)

f1\_macro : 0.79292 (0.00000)

f1\_micro : 0.85586 (0.00000)

f1\_weighted : 0.85547 (0.00000)

kappa : 0.80201 (0.00000)

precision\_macro : 0.78611 (0.00000)

precision\_micro : 0.85586 (0.00000)

precision\_weighted : 0.86090 (0.00000)

recall\_macro : 0.80465 (0.00000)

recall\_micro : 0.85586 (0.00000)

recall\_weighted : 0.85586 (0.00000)

################################################################################

Fitting: MLPClassifier(activation='relu', alpha=0.0001, batch\_size='auto', beta\_1=0.9,

beta\_2=0.999, early\_stopping=False, epsilon=1e-08,

hidden\_layer\_sizes=(100,), learning\_rate='constant',

learning\_rate\_init=0.001, max\_fun=15000, max\_iter=200,

momentum=0.9, n\_iter\_no\_change=10, nesterovs\_momentum=True,

power\_t=0.5, random\_state=42, shuffle=True, solver='adam',

tol=0.0001, validation\_fraction=0.1, verbose=False,

warm\_start=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 45.5s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 5.6min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 14.0min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 16.5min finished

/usr/local/lib/python3.7/dist-packages/sklearn/neural\_network/\_multilayer\_perceptron.py:571: ConvergenceWarning: Stochastic Optimizer: Maximum iterations (123) reached and the optimization hasn't converged yet.

% self.max\_iter, ConvergenceWarning)

Best parameters:

{'activation': 'relu', 'alpha': 0.017436642900499146, 'batch\_size': 32, 'hidden\_layer\_sizes': (200,), 'learning\_rate': 'adaptive', 'learning\_rate\_init': 0.0001, 'max\_iter': 123, 'solver': 'adam'}

/usr/local/lib/python3.7/dist-packages/sklearn/neural\_network/\_multilayer\_perceptron.py:571: ConvergenceWarning: Stochastic Optimizer: Maximum iterations (123) reached and the optimization hasn't converged yet.

% self.max\_iter, ConvergenceWarning)

Summary on test set:

Model: MLPClassifier

##################################################

accuracy : 0.73874 (0.00000)

f1\_macro : 0.65388 (0.00000)

f1\_micro : 0.73874 (0.00000)

f1\_weighted : 0.77035 (0.00000)

kappa : 0.66016 (0.00000)

precision\_macro : 0.66520 (0.00000)

precision\_micro : 0.73874 (0.00000)

precision\_weighted : 0.84047 (0.00000)

recall\_macro : 0.73698 (0.00000)

recall\_micro : 0.73874 (0.00000)

recall\_weighted : 0.73874 (0.00000)

################################################################################

Fitting: LinearDiscriminantAnalysis(n\_components=None, priors=None, shrinkage=None,

solver='svd', store\_covariance=False, tol=0.0001)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 76 tasks | elapsed: 2.1s

[Parallel(n\_jobs=4)]: Done 376 tasks | elapsed: 9.8s

[Parallel(n\_jobs=4)]: Done 493 out of 500 | elapsed: 12.6s remaining: 0.2s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 12.7s finished

Best parameters:

{'n\_components': 3, 'solver': 'svd'}

Summary on test set:

Model: LinearDiscriminantAnalysis

##################################################

accuracy : 0.68468 (0.00000)

f1\_macro : 0.60295 (0.00000)

f1\_micro : 0.68468 (0.00000)

f1\_weighted : 0.71896 (0.00000)

kappa : 0.58740 (0.00000)

precision\_macro : 0.61827 (0.00000)

precision\_micro : 0.68468 (0.00000)

precision\_weighted : 0.77966 (0.00000)

recall\_macro : 0.67220 (0.00000)

recall\_micro : 0.68468 (0.00000)

recall\_weighted : 0.68468 (0.00000)

################################################################################

Fitting: GaussianNB(priors=None, var\_smoothing=1e-09)

Summary on test set:

Model: GaussianNB

##################################################

accuracy : 0.62162 (0.00000)

f1\_macro : 0.57034 (0.00000)

f1\_micro : 0.62162 (0.00000)

f1\_weighted : 0.61941 (0.00000)

kappa : 0.49682 (0.00000)

precision\_macro : 0.58582 (0.00000)

precision\_micro : 0.62162 (0.00000)

precision\_weighted : 0.69248 (0.00000)

recall\_macro : 0.63932 (0.00000)

recall\_micro : 0.62162 (0.00000)

recall\_weighted : 0.62162 (0.00000)

################################################################################

Fitting: MultinomialNB(alpha=1.0, class\_prior=None, fit\_prior=True)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 283 tasks | elapsed: 0.8s

[Parallel(n\_jobs=4)]: Done 493 out of 500 | elapsed: 1.2s remaining: 0.0s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 1.2s finished

Best parameters:

{'alpha': 0.0007787658410143283, 'fit\_prior': False}

Summary on test set:

Model: MultinomialNB

##################################################

accuracy : 0.70270 (0.00000)

f1\_macro : 0.61446 (0.00000)

f1\_micro : 0.70270 (0.00000)

f1\_weighted : 0.73523 (0.00000)

kappa : 0.61422 (0.00000)

precision\_macro : 0.62931 (0.00000)

precision\_micro : 0.70270 (0.00000)

precision\_weighted : 0.81296 (0.00000)

recall\_macro : 0.69908 (0.00000)

recall\_micro : 0.70270 (0.00000)

recall\_weighted : 0.70270 (0.00000)

################################################################################

Fitting: BernoulliNB(alpha=1.0, binarize=0.0, class\_prior=None, fit\_prior=True)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 280 tasks | elapsed: 1.3s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 2.2s finished

Best parameters:

{'alpha': 0.0007787658410143283, 'fit\_prior': False}

Summary on test set:

Model: BernoulliNB

##################################################

accuracy : 0.77477 (0.00000)

f1\_macro : 0.72706 (0.00000)

f1\_micro : 0.77477 (0.00000)

f1\_weighted : 0.77011 (0.00000)

kappa : 0.69873 (0.00000)

precision\_macro : 0.72052 (0.00000)

precision\_micro : 0.77477 (0.00000)

precision\_weighted : 0.81192 (0.00000)

recall\_macro : 0.77012 (0.00000)

recall\_micro : 0.77477 (0.00000)

recall\_weighted : 0.77477 (0.00000)

################################################################################

Fitting: KNeighborsClassifier(algorithm='auto', leaf\_size=30, metric='minkowski',

metric\_params=None, n\_jobs=None, n\_neighbors=5, p=2,

weights='uniform')

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 57 tasks | elapsed: 9.2s

[Parallel(n\_jobs=4)]: Done 247 tasks | elapsed: 35.9s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 1.3min finished

Best parameters:

{'algorithm': 'kd\_tree', 'n\_neighbors': 1, 'p': 1, 'weights': 'uniform'}

Summary on test set:

Model: KNeighborsClassifier

##################################################

accuracy : 0.81081 (0.00000)

f1\_macro : 0.73630 (0.00000)

f1\_micro : 0.81081 (0.00000)

f1\_weighted : 0.81301 (0.00000)

kappa : 0.74146 (0.00000)

precision\_macro : 0.71491 (0.00000)

precision\_micro : 0.81081 (0.00000)

precision\_weighted : 0.82063 (0.00000)

recall\_macro : 0.77012 (0.00000)

recall\_micro : 0.81081 (0.00000)

recall\_weighted : 0.81081 (0.00000)

################################################################################

Fitting: DecisionTreeClassifier(ccp\_alpha=0.0, class\_weight=None, criterion='gini',

max\_depth=None, max\_features=None, max\_leaf\_nodes=None,

min\_impurity\_decrease=0.0, min\_impurity\_split=None,

min\_samples\_leaf=1, min\_samples\_split=2,

min\_weight\_fraction\_leaf=0.0, presort='deprecated',

random\_state=42, splitter='best')

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 280 tasks | elapsed: 1.5s

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 2.4s finished

Best parameters:

{'class\_weight': None, 'criterion': 'entropy', 'max\_features': 'sqrt', 'min\_samples\_split': 0.0007787658410143283, 'splitter': 'random'}

Summary on test set:

Model: DecisionTreeClassifier

##################################################

accuracy : 0.69369 (0.00000)

f1\_macro : 0.61634 (0.00000)

f1\_micro : 0.69369 (0.00000)

f1\_weighted : 0.70267 (0.00000)

kappa : 0.58668 (0.00000)

precision\_macro : 0.60190 (0.00000)

precision\_micro : 0.69369 (0.00000)

precision\_weighted : 0.72282 (0.00000)

recall\_macro : 0.67051 (0.00000)

recall\_micro : 0.69369 (0.00000)

recall\_weighted : 0.69369 (0.00000)

################################################################################

Fitting: SVC(C=1.0, break\_ties=False, cache\_size=200, class\_weight=None, coef0=0.0,

decision\_function\_shape='ovr', degree=3, gamma='scale', kernel='rbf',

max\_iter=-1, probability=True, random\_state=42, shrinking=True, tol=0.001,

verbose=False)

Fitting 10 folds for each of 50 candidates, totalling 500 fits

[Parallel(n\_jobs=4)]: Using backend LokyBackend with 4 concurrent workers.

[Parallel(n\_jobs=4)]: Done 42 tasks | elapsed: 24.6s

[Parallel(n\_jobs=4)]: Done 192 tasks | elapsed: 2.1min

[Parallel(n\_jobs=4)]: Done 442 tasks | elapsed: 5.4min

[Parallel(n\_jobs=4)]: Done 500 out of 500 | elapsed: 6.1min finished

/usr/local/lib/python3.7/dist-packages/sklearn/svm/\_base.py:231: ConvergenceWarning: Solver terminated early (max\_iter=180). Consider pre-processing your data with StandardScaler or MinMaxScaler.

% self.max\_iter, ConvergenceWarning)

Best parameters:

{'C': 83.24526408004218, 'degree': 2, 'gamma': 0.7797658410143283, 'kernel': 'rbf', 'max\_iter': 180}

/usr/local/lib/python3.7/dist-packages/sklearn/svm/\_base.py:231: ConvergenceWarning: Solver terminated early (max\_iter=180). Consider pre-processing your data with StandardScaler or MinMaxScaler.

% self.max\_iter, ConvergenceWarning)

Summary on test set:

Model: SVC

##################################################

accuracy : 0.75676 (0.00000)

f1\_macro : 0.69803 (0.00000)

f1\_micro : 0.75676 (0.00000)

f1\_weighted : 0.75717 (0.00000)

kappa : 0.66774 (0.00000)

precision\_macro : 0.67538 (0.00000)

precision\_micro : 0.75676 (0.00000)

precision\_weighted : 0.76275 (0.00000)

recall\_macro : 0.73272 (0.00000)

recall\_micro : 0.75676 (0.00000)

recall\_weighted : 0.75676 (0.00000)

