Supervised Learning with scikit-learn Cheat Sheet

by elhamsh via cheatography.com/31327/cs/14694/

InitialDataProcessing

df.info()	
df.shape	
df.head()	
df.describe()	
plt.figure() sns.countplot(x='education', hue='party', data=df, palette='RdBu') plt.xticks([0,1], ['No', 'Yes']) plt.show()	n sns.countplot(), we specify the x-axis data to be 'education', and hue to be 'party'. Recall that 'party' is also our target variable. So the resulting plot shows the difference in voting behavior between the two parties for the 'education' bill, with each party colored differently. We manually specified the color to be 'RdBu', as the Republican party has been traditionally associated with red, and the Democratic party with blue.

unsupervised

from sklearn.cluster import KMeans	# Import KMeans
model = KMeans(n_clusters=3)	# Create a KMeans instance with 3 clusters: model
model.fit(points)	# Fit model to points
labels = model.predict(new_points)	# Determine the cluster labels of new_points: labels

unsupervised (cont)

centroids = model.cluster_centers_	Assign the cluster centers: centroids. note that model was KMeans-(n_clulsters=k)
df = pd.DataFrame({'NameOfArray1': array1, 'NameOfArray2': aray2})	Create a DataFrame with arrays as columns: df
pd.crosstab(df['NameOfArray1'], df['NameOfArray2'])	It is a table where it contains the counts the number of times each array2 coincides with each array1 label.

Classification

X = df.drop('targetvariable', axis=1).values	Note the use of .drop() to drop the target variable from the feature array X as well as the use of the .values attribute to ensure X are NumPy arrays
knn = KNeighborsClassifier(n_neighbors=6)	nstantiate a KNeighborsClassifier called knn with 6 neighbors by specifying the n_neighbors parameter.
knn.fit(X, y)	the classifier to the data using the .fit() method. X is the features, y is the target variable
from sklearn.neighbors import KNeighborsClassifier	Import KNeighborsClassifier from sklearn.neighbors
knn.predict(X_new)	Predict for the new data point X_new

Classification (cont)

from sklearn.model_selection import train_test_split	
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = .2, random_state=42, stratify=y)	Create stratified training and test sets using 0.2 for the size of the test set. Use a random state of 42. Stratify the split according to the labels so that they are distributed in the training and test sets as they are in the original dataset.
knn.score(X_test, y_test)	Compute and print the accuracy of the classifier's predictions using the .score() method.
np.arange(1, 9)	numpy array from 0 to 8=np.arange(1, 9)
for counter, value in enumerate(some_list): print(counter, value)	Enumerate is a built-in function of Python. It's usefulness can not be summarized in a single line. Yet most of the newcomers and even some advanced programmers are unaware of it. It allows us to loop over something and have an automatic counter.

Classification (cont)

my_list = ['apple', 'banana', 'grapes', 'pear'] for c, value in enumerate(my_list, 1): print(c, value)	Output: # 1 apple # 2 banana # 3 grapes # 4 pear

Regression

df['ColName1'].corr(df['Colname2'])	Caluclate the correlation between ColName1 and ColName2 in dataframe df
numpy.linspace(start, stop, num = 50, endpoint = True, retstep = False, dtype = None)	Returns number spaces evenly w.r.t interval. Similiar to arange but instead of step it uses sample number. Parameters : -> start : [optional] start of interval range. By default start = 0 -> stop : end of interval range -> restep : If True, return (samples, step). By deflut restep = False -> num : [int, optional] No. of samples to generate -> dtype : type of output array
from sklearn.linear_model import LinearRegression	Import LinearRegression
from sklearn.metrics import mean_squared_error	
from sklearn.metrics import mean_squared_error	

Regression (cont)

mean_squared_error(y_true, y_pred, sample_weight=None, multioutput='uniform_average')	Mean squared error regression loss
from sklearn.model_selection import cross_val_score	
reg = LinearRegression()	Create a linear regression object: reg
cv_scores = cross_val_score(reg, X, y, cv=5)	Compute 5-fold cross-validation scores: cv_scores
from sklearn.linear_model import Lasso	Import Lasso
lasso = Lasso(alpha=0.4, normalize=True)	# Instantiate a lasso regressor: lasso
lasso.fit(X, y)	# Fit the regressor to the data
lasso_coef = lasso.coef_	# Compute and print the coefficients
from sklearn.linear_model import Ridge	# Import necessary modules

Regression (cont)

def display_plot(cv_scores, cv_scores_std): fig = plt.figure() ax = fig.add_subplot(1,1,1) ax.plot(alpha_space, cv_scores) std_error = cv_scores_std / np.sqrt(10) ax.fill_between(alpha_space, cv_scores + std_error, cv_scores - std_error, alpha=0.2) ax.set_ylabel('CV Score +/- Std Error') ax.set_xlabel('Alpha') ax.axhline(np.max(cv_scores), linestyle='--', color='.5') ax.set_xlim([alpha_space[0], alpha_space[-1]]) ax.set_xscale('log') plt.show()	you will practice fitting ridge regression models over a range of different alphas, and plot cross--validated R2 scores for each, using this function that we have defined for you, which plots the R2 score as well as standard error for each alpha:
cross_val_score(Ridge(normalize=True), X, y, cv=10)	erform 10-fold CV for Rdige Regressin.