ElasticNet

# example code

|  |
| --- |
| # Import list  import pandas as pd  import numpy as np  from sklearn.linear\_model import ElasticNet  from sklearn.metrics import mean\_squared\_error  from sklearn.metrics import mean\_absolute\_error  from sklearn import preprocessing  from sklearn.model\_selection import train\_test\_split  from sklearn.metrics import r2\_score  import matplotlib.pyplot as plt  # Global array.  my\_predictions = {}  my\_pred = {}  my\_actual = {}  my\_name = {}  # def for draw graph.  def plot\_predictions(name\_s,pred\_s,actual\_s):        for name in name\_s:          df = pd.DataFrame({'prediction':pred\_s[name],'actual':actual\_s[name]})          df = df.sort\_values(by='actual').reset\_index(drop=True)          plt.figure(figsize=(11,8))          plt.scatter(df.index, df['prediction'],marker='x',color='r')          plt.scatter(df.index,df['actual'],alpha=0.7,marker='o',color='black')          plt.title(name,fontsize=15)          plt.legend(['prediction','actual'],fontsize=12)          plt.show()    # def for add model name, test\_data, prediction\_data to Global array and check mse.  def add\_model(name\_,pred,actual):      global my\_predictions,my\_pred,my\_actual,my\_name      my\_name[name\_] = name\_      my\_pred[name\_] = pred      my\_actual[name\_] = actual      mse = mean\_squared\_error(pred,actual)      my\_predictions[name\_] = mse  # def for check the result.  def plot\_all():      global my\_predictions,my\_pred,my\_actual,my\_name      plot\_predictions(my\_name,my\_pred,my\_actual)      y\_value = sorted(my\_predictions.items(),key=lambda x: x[1],reverse=True)      df = pd.DataFrame(y\_value,columns=['model','mse'])      print(df)      min\_ = df['mse'].min() - 10      max\_ = df['mse'].max() + 10      length = len(df)      plt.figure(figsize=(9,length))      ax = plt.subplot()      ax.set\_yticks(np.arange(len(df)))      ax.set\_yticklabels(df['model'],fontsize=12)      bars = ax.barh(np.arange(len(df)),df['mse'],height=0.3)      for i, v in enumerate(df['mse']):          ax.text(v+2,i,str(round(v,3)),color='k',fontsize=12,fontweight='bold',verticalalignment='center')      plt.title('mse error',fontsize=16)      plt.xlim(min\_,max\_)      plt.show()  # RandomSeed  SEED = 30  # Load dataset.  data = pd.read\_csv('winequality-red.csv')  x = data[['fixed acidity','volatile acidity','citric acid','residual sugar','alcohol','free sulfur dioxide','density','chlorides','pH','sulphates']]  y = data['total sulfur dioxide']  # Split sameple Data (test,train set).  x\_train,x\_test,y\_train,y\_test = train\_test\_split(x,y,random\_state=SEED)  # alpha and l1\_ratio list.  alphas = [100, 10, 1, 0.1, 0.01, 0.001, 0.0001]  ratios = [0.2,0.5,0.8]  # Make ElasticNet model and test the model.  for ratio in ratios:      for alpha in alphas:          elasticnet = ElasticNet(alpha = alpha, l1\_ratio=ratio,random\_state=SEED)          elasticnet.fit(x\_train,y\_train)          pred = elasticnet.predict(x\_test)          # Add test result in Global array.          add\_model('ElasticNet(l1\_ratio = {},alpha = {})'.format(ratio,alpha),pred,y\_test)  # Check the Result all.  plot\_all() |

# testing result

|  |
| --- |
| 0 ElasticNet(l1\_ratio = 0.2,alpha = 100) 816.349379  1 ElasticNet(l1\_ratio = 0.5,alpha = 100) 812.328176  2 ElasticNet(l1\_ratio = 0.8,alpha = 100) 806.505532  3 ElasticNet(l1\_ratio = 0.8,alpha = 10) 690.907030  4 ElasticNet(l1\_ratio = 0.5,alpha = 10) 690.295913  5 ElasticNet(l1\_ratio = 0.2,alpha = 10) 687.779429  6 ElasticNet(l1\_ratio = 0.8,alpha = 1) 668.661732  7 ElasticNet(l1\_ratio = 0.5,alpha = 1) 667.850983  8 ElasticNet(l1\_ratio = 0.2,alpha = 1) 667.401085  9 ElasticNet(l1\_ratio = 0.2,alpha = 0.1) 661.922424  10 ElasticNet(l1\_ratio = 0.5,alpha = 0.1) 659.035295  11 ElasticNet(l1\_ratio = 0.8,alpha = 0.1) 651.198896  12 ElasticNet(l1\_ratio = 0.2,alpha = 0.01) 640.188005  13 ElasticNet(l1\_ratio = 0.5,alpha = 0.01) 637.005287  14 ElasticNet(l1\_ratio = 0.8,alpha = 0.01) 632.082031  15 ElasticNet(l1\_ratio = 0.2,alpha = 0.001) 626.702631  16 ElasticNet(l1\_ratio = 0.5,alpha = 0.001) 624.965874  17 ElasticNet(l1\_ratio = 0.8,alpha = 0.001) 622.768316  18 ElasticNet(l1\_ratio = 0.2,alpha = 0.0001) 621.518032  19 ElasticNet(l1\_ratio = 0.5,alpha = 0.0001) 621.209280  20 ElasticNet(l1\_ratio = 0.8,alpha = 0.0001) 620.809946 |

