```
import sklearn.datasets import numpy as np

breast_cancer=sklearn. datasets. load_breast_cancer()

x=breast_cancer.data y=breast_cancer. Target

print(x.shape,y.shape)

import pandas as pd

data=pd. DataFrame(breast_cancer.data, columns=breast_cancer. feature_names)

data['class']=breast_cancer. Target

data.head()

data.describe()

from sklearn.model_selection import train_test_split

x=data.drop('class',axis=1) y=data['class']

type(x)

x_train, x_test, y_train, y_test=train_test_split(x,y)

print(y.shape, y_train. shape, y_test. shape)

x_train, x_test, y_train, y_test=train_test_split(x,y, test_size=0.1)

print(y.mean(),y_train.mean(),y_test.mean())

x_train, x_test, y_train, y_test=train_test_split(x,y, test_size=0.1, stratify = y)

print(x_train.mean(),x_test.mean(),x.mean())

x_train=x_train.values x_test=x_test.values

type(x_train)

from sklearn.metrics import accuracy_score import matplotlib.pyplot as plt

def model(w,b,x): return 1 if (np.dot(w,x)>=b) else 0 def predict(w,b,X): Y=[] for x in X:
result=model(w,b,x) Y.append(result) return np.array(Y) def fit(X,Y, epochs=1,lr=1):
W=np.ones(X.shape[1]) b=e accuracy={} max_accuracy=0 wt_matrix=[] for i in
range(epochs): for x,y in zip(X,Y): y_pred=model(w,b,x) if y == 1 and y_pred == 0: W=W+lr*x
b=b-lr*1 elif y == 0 and y_pred == 1: W=w-1r*x b=b+lr*1 wt_matrix.append(w)
accuracy[i]=accuracy_score(predict(w,b,X),Y) if(accuracy[i]>max_accuracy):
max_accuracy=accuracy[i] chkptw=w chkptb=b w=chkptw b=chkptb print(max_accuracy)
plt.plot(accuracy.values()) plt.ylim([0,1]) plt.show() return np.array(wt_matrix),w,b

wt_matrix,w,b=fit(x_train,y_train,10000,0.5) print(w)
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y_pred_test=predict(w,b,x_test) print(accuracy_score(y_pred_test,y_test))
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