(1) Linear Regression

import numpy as no limited and import pardas as pd import notplotlib. pyplot as plt

defrethnate = coef (2,y):

n = mp. eize (x)

m-x = np.nean(x)

M-y = np. mean (y)

55-xy = np. pum ((x-m-x1) \* (y-m-y))

TEND

SS\_ >1 x = np. sum ((x-m\_>1) \* \*2)

b-1 = ss-xx / ss-xx

6-0 = m-y-5-1 \* m-x

return (b-0, b-1)

def plot-regression\_line (x, y, b):

plt. reatter (x, y, color : 'm'. nacker = "0", 5= 30)

y-pred = 1 [0] + 6 [1] \* x

plt. plot (x, y pred, color = 'y')

plt-xladel ('x')

plt. ylabel ('y')

pt. title ('Linear Regression')

plt. show ()

file-path = input ("Exter the path to use file: ")

df = pd. ead\_esr (filepath)

x = df. ila [:, o] ralue,

y = dp. iler (:, 1) ralues

b = estimate - coef (x,y)

print (f''Estenated\_coefficients:  $n = 0 = \{b(i)\}$ )

plot - regression\_line (x, y, b)

of the first first file (1) follows from the Output. Enter the poth to the cer file (6000) /content / tromarketing. con PORTS BURNISH MOST 114 6-0= 7.032593 6-1-0.047536 pull scratter (y y put where blue (" willia tout a ) polat . 1) ( what ( in the led where ) Multiple linear regrellion import numpy as no impost pardas as pd impact matpletlib. pyplot as plt Luglin dota = 1 "Feature 1": (1,2,3, h,5, 6,7,8,9,10), "Feature 2"; [2,3,5,7,11,13, 17, 19, 23, 29] "Fecture 3" : [3,6,9,12,15,18,21,24,27,30], "Target": [5,9, 15,22,31,41,53,66,80,96] df = pd. Data Frame (data) X = df. drop(columns = ['taget']), values Y= df. ('target']. raluer. seshape (-1,1) responsible interiory x = np. helack ((np. ones (x shape [o], 1)), x))
beta = np. linalg. solve (x. 7 @x + 0.01 \* np. identity (x. shape [i])), x. T@y) : ( ) Liongia fel silver 1/ (1+ m. onp.(-2)) y-pred = x@ beta mse = np. near ((y - y-pred)\* \* 2) - Colette with for the stages feb total-was = np. sum ((y - np. mean [y)) \* \* 2) esup-rate = np. sum ((y-pred - np. mean (y)) \* \* 2) ( ) mes on (m) [-) & 2 = exp-ral/total-rag

print ("Model welfinierts: ", beta [1.]. flatter ()) print ("Intercept: ", beta (0)(07) print ("Mean squared eles: ", mee) print ( R. squared error: ", 22) plt. rotter (y, y-pred, color= 'blue') plt. plot (y, y-, colos = 'sed', hirestype = '--') plt. slabel ("Actual ratures") plt. ylabel (" predicted values") week september plt. show() output: Model coefficients: [0.402 3.313 0.120] Intercept ? -3.15 9950 R-savoro: 0-99 35328) 40 5 44 (15,00 136 68 33 horelon Literior 40 60 80 X ( ( ) spokes welf. Eter 3. Logistin regression import numpy as up ( ( ( to ) and ) and ) import matplotlik, pyplot ar plto. def signoid (z): setur 1/(1+ np. esp(-2)) def compute - cost (x, y, theta): m = len(y) / ( \* + 1(y) man q = y) man q h = rignoid ( & @ theta)

cost = (-1/m) np. sum ( y > log (h) + (1-y) np. bog (1-h) return cost

```
def gradient_desect (x, y, theta, alpha, iteration):
          m _len (y)
                      and eagle that the house therefore
          cost_history = []
          for _ in range (it):
              grad = (1/m) * T@(signoid (x@ theta) =y)
                                   Da so tolare statistion tours
               theta == alpha grad
                                  istrue lagra watelling
         return theta. cost - history
                                  · (cx, 1x) gradial rootaling fel
def predit (x, thetal: " ((x - 14)) men go) toping and the
       return (signoid (x@theta) > 20.5), astypelint)
                                                 WW4 120)
accuracy = np. mean (y-pred = = y)
print ("Accusary: facurary: 2+ 3")
                                       ( y x Ma) +7 fri
                              (X) god on a mod X flow
output:
                              (b) where on a way (b)
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