Question 1

Question 1(a)

[[0.36242688 0.23777354 0.1120719 0.2848713 0.23373627]
 [0.60043895 0.72656537 0.97684933 0.74920914 0.49325742]
 [0.41408058 0.01572716 0.74512262 0.26430416 0.69007438]
 [0.75698728 0.28823586 0.91665928 0.1867089 0.62631321]]

Question 1(b)

[[0.57075712]
 [0.70926133]
 [0.62016992]
 [0.45108444]]

Question 1(c)

[[0.36242688 0.23777354 0.1120719 0.2848713 0.23373627 0.60043895
  0.72656537 0.97684933 0.74920914 0.49325742]
 [0.41408058 0.01572716 0.74512262 0.26430416 0.69007438 0.75698728
  0.28823586 0.91665928 0.1867089 0.62631321]]

Question 1(d)

[[-0.20833024 -0.33298358 -0.45868523 -0.28588582 -0.33702086]
 [-0.10882238 0.01730405 0.26758801 0.03994782 -0.21600391]
 [-0.20608933 -0.60444276 0.1249527 -0.35586575 0.06990447]
 [0.30590284 -0.16284859 0.46557483 -0.26437555 0.17522876]]

Question 1(e)

[0.57075712 0.70926133 0.62016992 0.45108444]

Question 1(f)

[[0.36242688 0.23777354 0.1120719 0.57075712 0.23373627]
 [0.60043895 0.72656537 0.97684933 0.70926133 0.49325742]
 [0.41408058 0.01572716 0.74512262 0.62016992 0.69007438]
 [0.75698728 0.28823586 0.91665928 0.45108444 0.62631321]]

Question 1(g)

[[0.68282902 -0.33298358 -0.45868523 -0.28588582 -0.33702086]
 [1.68611066 0.01730405 0.26758801 0.03994782 -0.21600391]
 [1.36529253 -0.60444276 0.1249527 -0.35586575 0.06990447]
 [1.36774372 -0.16284859 0.46557483 -0.26437555 0.17522876]]

Question 1(h)

[[0.36242688 0.23777354 0.1120719 0.57075712 0.23373627]

 [0.60043895 0.72656537 0.97684933 0.70926133 0.49325742]

 [0.41408058 0.01572716 0.74512262 0.62016992 0.69007438]]

Question 1(i)

[[0.23777354 0.72656537 0.01572716 0.28823586]

 [0.57075712 0.70926133 0.62016992 0.45108444]]

Question 1(j)

[[-1.01493253 -1.43643657 -2.18861469 -0.56079151 -1.45356187]

 [-0.51009431 -0.31942682 -0.02342285 -0.34353124 -0.70672409]

 [-0.88169467 -4.15236629 -0.29420649 -0.47776178 -0.37095589]

 [-0.27840883 -1.24397618 -0.08701944 -0.79610072 -0.4679047]]

Question 1(k)

10.547592832366853

Question 1(l)

[0.75698728 0.72656537 0.97684933 0.70926133 0.69007438]

Question 1(m)

3.506372397494631

Question 1(n)

[[2.86058783 -0.4838545   0.39860512 -0.42711251 -0.09025055]

 [1.80313325 -0.12304713 0.22151748 -0.12075065 -0.18546899]

 [3.99466733 -0.62007529 0.72986601 -0.50052269 -0.03606137]

 [3.04930388 -0.62609534 0.21549743 -0.47479086 -0.22316466]

 [2.79007785 -0.58839967 0.40260072 -0.45827306 -0.02733216]]

Question 1(o)

[[10.0119175]]

Question 2

Question 2(a)

Question 2(b)

Question 2(c)

The Execusion time for Using For loops with matrix 100 is 1.2082109451293945

The Execusion time for Using Numpy with matrix 100 is 0.001953125

The mamgnitude of B1-B2 is 7.59455305872513e-11

None

The Execusion time for Using For loops with matrix 300 is 33.4795298576355

The Execusion time for Using Numpy with matrix 300 is 0.03291177749633789

The mamgnitude of B1-B2 is 7.223432058564249e-09

None

The Execusion time for Using For loops with matrix 1000 is 1205.668818473816

The Execusion time for Using Numpy with matrix 1000 is 0.05883669853210449

The mamgnitude of B1-B2 is 4.0991904515679706e-07

None

Question 3

Question 3(a)

Question 3(b)

Question 3(c)

Question 3(d)

Figures now render in the Plots pane by default. To make them also appear inline in the Console, uncheck "Mute Inline Plotting" under the Plots pane options menu.

The value for a is [3.12941462] The value of b is [4.71935439]

The Training error is 0.8557483910540564

The Testing error is 0.9608049758277348

Question 4

Question 4(a)

The value of the weight vector and bias is below

[0.01694442 1.49601981 0.03738886]

-2.6250489555396475

Question 4(b)

This is accuracy1 {} 0.856

This is accuracy2 {} 0.857

The difference between two accuracy is -0.0010000000000000009

Question 4(c)

Question 4(d)

Question 5

I dont know

Question 6

Question 6(a)

Question 6(b)

Question 6(c)

The best value of k is 3

The validation accuracy of best value k is 0.9905013192612138

The test accuracy of best value k is 0.9929729729729729

Question 6(d)

The best value of k is 9

The best value of k is 9

The validation accuracy of best value k is 0.9975996159385502

The test accuracy of best value k is 0.9965174129353234

Question 6(e)
