2.1)

Using the given information, calculating the

For

Here, represents for the state

For

For

Therefore,

2.2)

For

For

For

2.3)

From the above results, we can conclude that both forward and backward algorithms agree.

2.4) Calculating

Hence the most likely sequence is

2.5)

Hence the most likely sequence is S1, S1 and S1

Question 1.

Expanding,

In order to minimize we have to maximize and hence both are equivalent.

3.

D)

For k = 1

Time taken for computation = 36.1047

Training accuracy = 60.1527

Test accuracy = 54.6364

For k = 3

Time taken for computation = 18.0293

Training accuracy = 86.6961

Test accuracy = 79.5

For k = 5

Time taken for computation = 16.5943

Training accuracy = 95.3753

Test accuracy = 87.1818

For k = 15

Time taken for computation = 13.2664

Training accuracy = 97.7952

Test accuracy = 89.2273

For k = 100

Time taken for computation = 13.3101

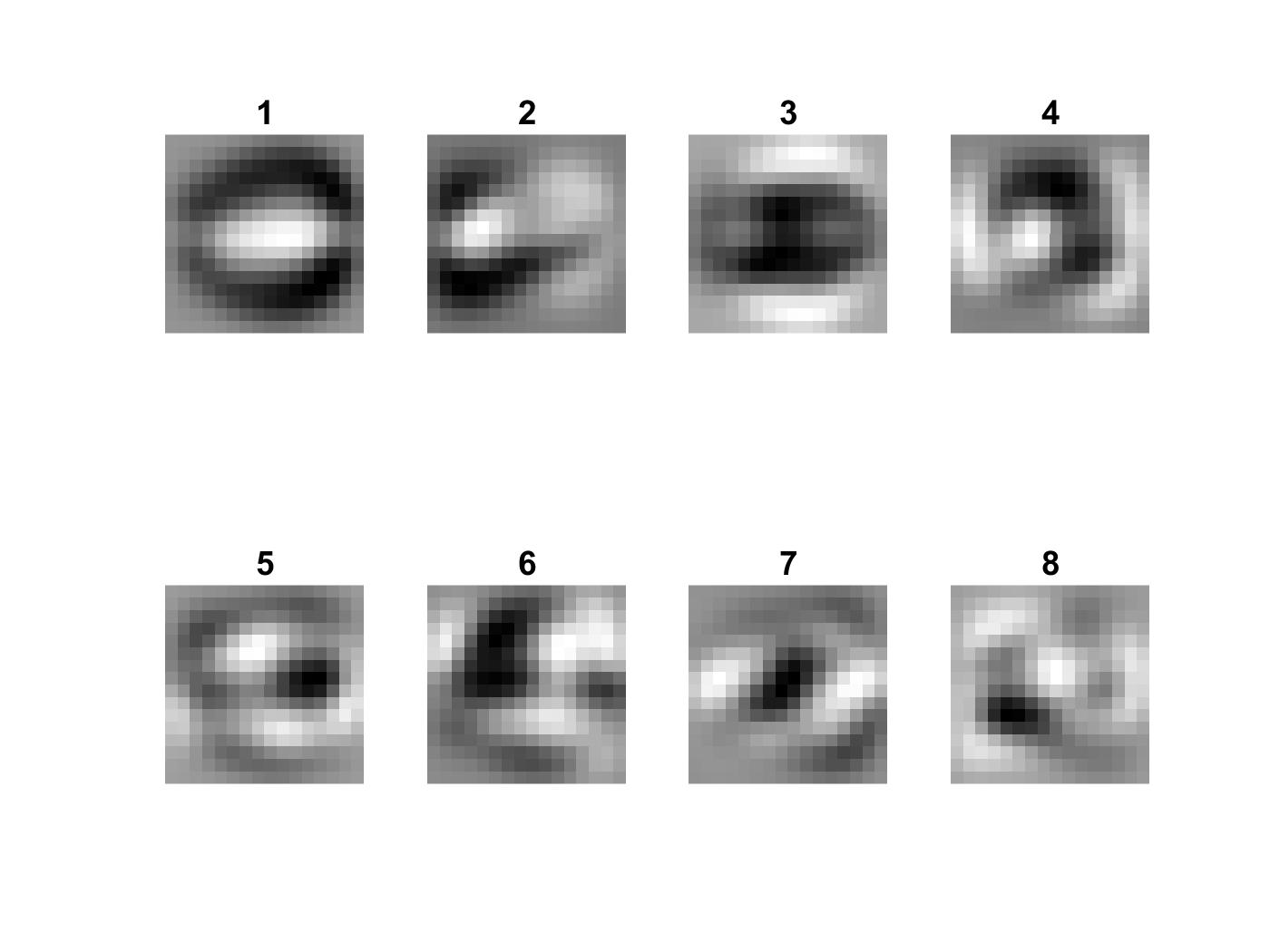
Training accuracy = 97.5694

Test accuracy = 88.9545

Increase in K values results in increase in accuracy in both training and test data. Till it reaches a point. This is because higher the number of K, higher the information retained in the reconstruction of image.

For Runtime, we see that it reduces as the value of K increases and after reaching a plateau the runtime starts to increase again.

B)



C)

