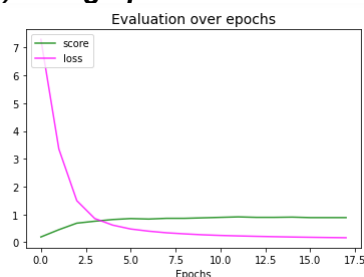### a) Epoch number, Training loss, validation loss, validation score, and step size (eta).

```
Epoch  1 of 18: Validation Loss =  7.29500874414976 Validation score =  0.
19130434782608696 Eta = 0.001
Epoch  2 of 18: Validation Loss =  3.352741419973616 Validation score =
0.45217391304347826 Eta = 0.001
Epoch  3 of 18: Validation Loss =  1.4949461866217486 Validation score =
0.6869565217391305 Eta = 0.001
Epoch  4 of 18: Validation Loss =  0.8535534700224807 Validation score =
0.7565217391304347 Eta = 0.001
Epoch  5 of 18: Validation Loss =  0.616315895154119 Validation score =
0.8173913043478261 Eta = 0.001
Epoch  6 of 18: Validation Loss =  0.4769825319094993 Validation score =
0.8521739130434782 Eta = 0.001
Epoch  7 of 18: Validation Loss =  0.39922797404826843 Validation score =
 0.8347826086956521 Eta = 0.001
Epoch  8 of 18: Validation Loss =  0.3410384657812385 Validation score =
0.8608695652173913 Eta = 0.001
Epoch  9 of 18: Validation Loss =  0.3020904267778269 Validation score =
0.8608695652173913 Eta = 0.001
Epoch  10 of 18: Validation Loss =  0.2689385309441057 Validation score =
 0.8782608695652174 Eta = 0.001
Epoch  11 of 18: Validation Loss =  0.24539158580155218 Validation score =
 0.8956521739130435 Eta = 0.001
Epoch  12 of 18: Validation Loss =  0.22810031746827195 Validation score =
 0.9130434782608695 Eta = 0.001
Epoch  13 of 18: Validation Loss =  0.21321170358029312 Validation score =
 0.8956521739130435 Eta = 0.001
Epoch  14 of 18: Validation Loss =  0.20050440480463572 Validation score =
 0.8956521739130435 Eta = 0.001
Epoch  15 of 18: Validation Loss =  0.1883504506316119 Validation score =
 0.9043478260869565 Eta = 0.001
Epoch  16 of 18: Validation Loss =  0.1791114529620948 Validation score =
 0.8869565217391304 Eta = 0.001
Epoch  17 of 18: Validation Loss =  0.17061472162029132 Validation score =
 0.8869565217391304 Eta = 0.001
Epoch  18 of 18: Validation Loss =  0.16327586141207154 Validation score =
 0.8869565217391304 Eta = 0.001
```

b) Two graphs

c)For training data: accuracy, no. of correct predictions, confusion matrix, precision, recall, f1 score for each class.

Confusion matrix:

```
[[[1288    4]
  [   2  143]]

 [[1271   12]
  [  16  138]]

 [[1284    9]
  [  10  134]]

 [[1275   13]
  [  16  133]]

 [[1293    9]
  [  13  122]]

 [[1294    8]
  [   8  127]]

 [[1288    3]
  [   7  139]]

 [[1285    7]
  [   8  137]]

 [[1268   25]
  [  15  129]]

 [[1278   19]
  [  14  126]]]
F1: 0.9241475295755045
Precision: 0.9241475295755045
Recall: 0.9241475295755045
Accuracy: 0.9241475295755045
```

d) For test data: accuracy, no. of correct predictions, confusion matrix, precision, recall, f1 score for each class.
```
[[[326    1]
  [   2   31]]

 [[328    4]
  [   4   24]]

 [[324    3]
  [   3   30]]

 [[324    2]
  [   1   33]]

 [[312    2]
  [   3   43]]

 [[310    3]
  [   5   42]]
```

```
 [[325    0]
  [  1   34]]


 [[324    2]
  [  3   31]]


 [[323    7]
  [  5   25]]


 [[311    9]
  [  6   34]]]
F1: 0.9083333333333333
Precision: 0.9083333333333333
Recall: 0.9083333333333333
Accuracy: 0.9083333333333333
```