Fabric AOI Lab Report

- **Explanation**
  The training methods will be somewhat different in Step 3, particularly when we set a small number of epochs like 10. In such cases, the results can vary significantly each time you retrain the process.

```
Epoch 1/10
4/4 [==============================] - 3s 368ms/step - loss: 0.5550 - accuracy: 0.7900 - val_loss: 0.8219 - val_accuracy: 0.6667
Epoch 2/10
4/4 [==============================] - 2s 398ms/step - loss: 0.5044 - accuracy: 0.8100 - val_loss: 0.6059 - val_accuracy: 0.6667
Epoch 3/10
4/4 [==============================] - 1s 269ms/step - loss: 0.4610 - accuracy: 0.8100 - val_loss: 0.6292 - val_accuracy: 0.6667
Epoch 4/10
4/4 [==============================] - 1s 247ms/step - loss: 0.4584 - accuracy: 0.8100 - val_loss: 0.6429 - val_accuracy: 0.6667
Epoch 5/10
4/4 [==============================] - 1s 236ms/step - loss: 0.4485 - accuracy: 0.8100 - val_loss: 0.5868 - val_accuracy: 0.6667
Epoch 6/10
4/4 [==============================] - 1s 224ms/step - loss: 0.4663 - accuracy: 0.8100 - val_loss: 0.5974 - val_accuracy: 0.6667
Epoch 7/10
4/4 [==============================] - 1s 246ms/step - loss: 0.4075 - accuracy: 0.8100 - val_loss: 0.7739 - val_accuracy: 0.6667
Epoch 8/10
4/4 [==============================] - 1s 236ms/step - loss: 0.4703 - accuracy: 0.8100 - val_loss: 0.5930 - val_accuracy: 0.6667
Epoch 9/10
4/4 [==============================] - 1s 238ms/step - loss: 0.4283 - accuracy: 0.8100 - val_loss: 0.5609 - val_accuracy: 0.6667
Epoch 10/10
4/4 [==============================] - 1s 252ms/step - loss: 0.4271 - accuracy: 0.8100 - val_loss: 0.5573 - val_accuracy: 0.6667
<keras.src.callbacks.History at 0x7f922e84a830>
```

- **Comparison of the results**
  Since the results can be really different each time we retrain the process, we will present different confusion matrices and related F1 scores.

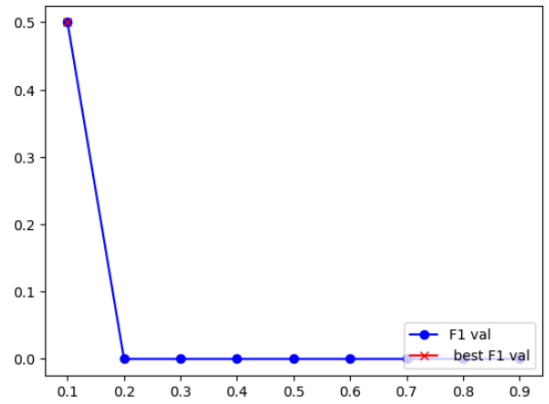
Test	Confusion matrix	Best F1	F1 score of testing
1	[[0 3] [0 9]]	F1 = 0.5 threshold = 0.2	Argmax = 0.0 threshold = 0.5
2	[[0 1] [0 11]]	F1 = 0.33333333333 threshold = 0.2	Argmax = 0.0 threshold =0.74999999999
3	[[0 1] [0 11]]	F1= 1.0 threshold= 0.30000000000000004	Argmax = 0.0 threshold = 1.0
4	[[0 4] [0 8]]	F1= 1.0 threshold= 0.2	Argmax = 0.0 threshold = 1.0

- **Screenshots of Results - Test 1**
  Confusion matrix

```
USING ARGMAX:
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 99ms/step

validation confusion matrix:
 [[0 3]
 [0 9]]

validation F1 score: 0.0
```

  best F1

```
USING THRESHOLD WITH BEST F1 SCORE:

Best validation F1= 0.5 with threshold= 0.1
```



F1 score

```
F1 score of the testing data with argmax = 0.0

F1 score of the testing data with threshold = 0.5
```

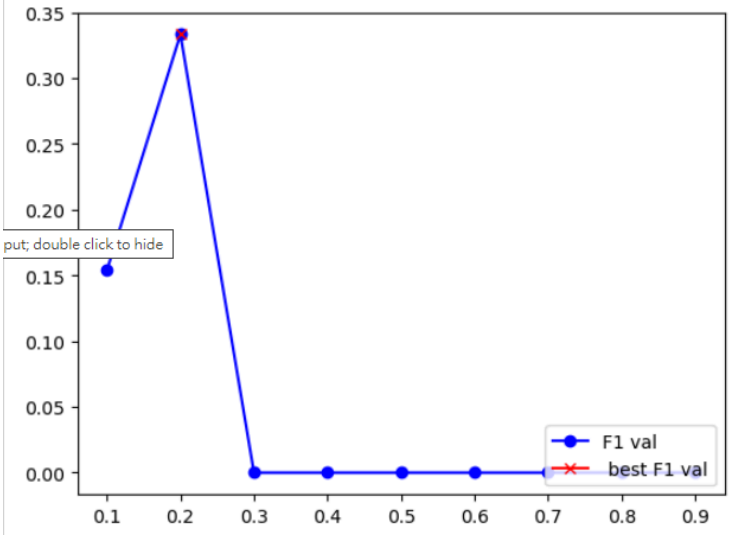
- **Screenshots of Results - Test 2**

  Confusion matrix

```
USING ARGMAX:
1/1 ━━━━━━━━━━━━━━━━━━━━ 0s 109ms/step

validation confusion matrix:
 [[ 0  1]
 [ 0 11]]

validation F1 score: 0.0
```

  best F1

```
USING THRESHOLD WITH BEST F1 SCORE:

Best validation F1= 0.33333333333333337 with threshold= 0.2
```



F1 score

```
F1 score of the testing data with argmax = 0.0

F1 score of the testing data with threshold = 0.7499999999999999
```

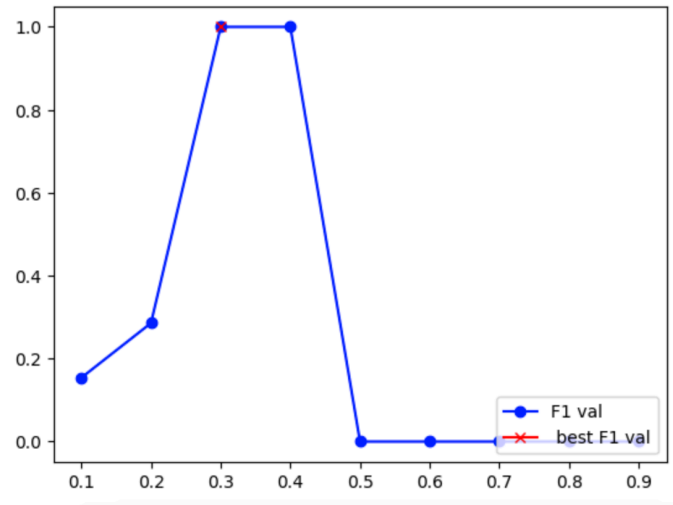
- **Screenshots of Results - Test 3**

Confusion matrix

```
USING ARGMAX:
1/1 [==============================] - 0s 169ms/step

validation confusion matrix:
 [[ 0  1]
 [ 0 11]]

validation F1 score: 0.0
```

best F1

```
USING THRESHOLD WITH BEST F1 SCORE:

Best validation F1= 1.0 with threshold= 0.30000000000000004
```



F1 score

```
F1 score of the testing data with argmax = 0.0

F1 score of the testing data with threshold = 1.0
```

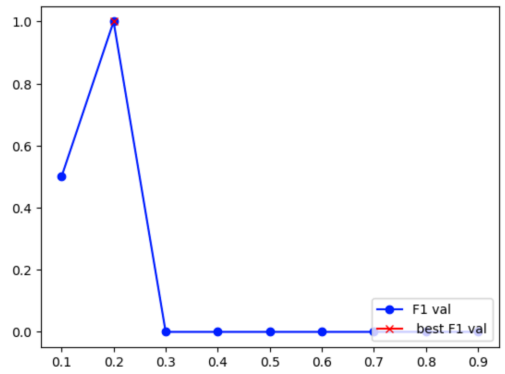
- **Screenshots of Results - Test 4**

  Confusion matrix

```
USING ARGMAX:
1/1 [==============================] - 0s 131ms/step

validation confusion matrix:
 [[0 4]
 [0 8]]

validation F1 score: 0.0
```

  best F1

```
USING THRESHOLD WITH BEST F1 SCORE:

Best validation F1= 1.0 with threshold= 0.2
```



  F1 score

```
F1 score of the testing data with argmax = 0.0

F1 score of the testing data with threshold = 1.0
```