Confusion Matrix

```
print(confusion_matrix(y_test, scaled_pred))
```

```
[[11354  1278]
 [ 1798   527]]
```

		Predictions		
		0	1	
Actual	0	11,354	1278	12,632
	1	1798	527	2,325
		13,152	1,805	

		Predictions		
		No	Yes	
Bad Loan	No	TP	FN	
	Yes	FP	TN	

Recall

```
print(classification_report(y_test, scaled_pred))
```

	precision	recall	f1-score	support
0	0.86	0.90	0.88	12632
1	0.29	0.23	0.26	2325
micro avg	0.79	0.79	0.79	14957
macro avg	0.58	0.56	0.57	14957
weighted avg	0.77	0.79	0.78	14957

		Predictions		
		0	1	
Actual	0	11,354	1278	12,632
	1	1798	527	2,325
		13,152	1,805	

		Predictions		
		No	Yes	
Bad Loan	No	TP	FN	
	Yes	FP	TN	

The recall is the ratio

- tp / (tp + fn)
- where tp is the number of true positives
- fn the number of false negatives.
- The recall is intuitively the ability of the classifier to find all the positive samples.
- 11,354 / 12,632) = 0.90

Precision

```
print(classification_report(y_test, scaled_pred))
```

	precision	recall	f1-score	support
0	0.86	0.90	0.88	12632
1	0.29	0.23	0.26	2325
micro avg	0.79	0.79	0.79	14957
macro avg	0.58	0.56	0.57	14957
weighted avg	0.77	0.79	0.78	14957

		Predictions		
		0	1	
Actual	0	11,354	1278	12,632
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		13,152	1,805	

		Predictions		
		No	Yes	
Bad Loan	No	TP	FN	
	Yes	FP	TN	

The precision is the ratio:

- tp / (tp + fp)
- tp is the number of true positives
- fp the number of false positives.
- The precision is intuitively the ability of the classifier not to label as positive a sample that is negative.

11,354 / 13,152 = 0.86

F1

`sklearn.metrics.` **`f1_score`** *(y_true, y_pred, labels=None, pos_label=1, average='binary', sample_weight=None)* [source]

Compute the F1 score, also known as balanced F-score or F-measure

The F1 score can be interpreted as a weighted average of the precision and recall, where an F1 score reaches its best value at 1 and worst score at 0. The relative contribution of precision and recall to the F1 score are equal. The formula for the F1 score is:

```
F1 = 2 * (precision * recall) / (precision + recall)
```

- F1 = 2 * (0.86 * 0.90) / (0.86 + 0.90)
- F1 = 2 * (0.774) / (1.76)
- F1 = 0.88