

1 Using NB:

1.1 Test Report Without Stop-words:

| | ham | spam |
|---------------------------------------|--------------------|--------------------|
| Wrongly classified files /total files | 11/348 | 21/130 |
| Accuracy | 96.83908045977012% | 83.84615384615385% |

1.2 Test Report With Stop-words

| | ham | spam |
|---------------------------------------|--------------------|--------------------|
| Wrongly classified files /total files | 13/348 | 19/130 |
| Accuracy | 96.26436781609196% | 85.38461538461539% |

Conclusion: accuracy will improve without stop-words. This is because NB produces real prob data, without stop-words the prob will get closer to real values;

2 Using Logistic Regression:

2.1 lambda: 0.001, eta: 0.01, iterations: 200

| | With stop-words | | Without stop-words | |
|---------------------------------------|-----------------|-------|--------------------|-------|
| | ham | spam | ham | spam |
| Wrongly classified files /total files | 1/348 | 3/130 | 1/348 | 4/130 |
| Accuracy | 99.7% | 97.6% | 99.7% | 96.9% |

2.2 lambda: 0.035, eta: 0.01, iterations: 200

| | With stop-words | | Without stop-words | |
|---------------------------------------|-----------------|--------|--------------------|---------|
| | ham | spam | ham | spam |
| Wrongly classified files /total files | 268/348 | 96/130 | 279/348 | 102/130 |
| Accuracy | 22.9% | 26.1% | 19.8% | 21.5% |

2.3 lambda: 0.075, eta: 0.01, iterations: 200

| | With stop-words | | Without stop-words | |
|---------------------------------------|-----------------|---------|--------------------|---------|
| | ham | spam | ham | spam |
| Wrongly classified files /total files | 285/348 | 103/130 | 330/348 | 112/130 |
| Accuracy | 18.1% | 20.7% | 5.1% | 13.8% |

Conclusion: lambda=0.001 has good performance. accuracy will NOT improve without stop-words. This is because LR doesn' t produce real prob data, without stop-words the prob will NOT get closer to real values;