

Naïve Bayes Report

Classification and Evaluation

Accuracies for different ALPHA

| ALPHA | Accuracy |
|-------|----------|
| 0.1 | 81.92% |
| 0.5 | 82.90% |
| 1.0 | 83.22% |
| 5.0 | 83.20% |
| 10.0 | 83.03% |

When ALPHA = 0.1

```
Reading Training Data
Reading Test Data
Computing Parameters
Evaluating
('Test Accuracy: ', 0.8192000000000004)
```

When ALPHA = 0.5

```
Reading Training Data
Reading Test Data
Computing Parameters
Evaluating
('Test Accuracy: ', 0.8289600000000003)
```

When ALPHA = 1.0

```
Reading Training Data
Reading Test Data
Computing Parameters
Evaluating
('Test Accuracy: ', 0.8321600000000001)
```

When ALPHA = 5.0

```
Reading Training Data
Reading Test Data
Computing Parameters
Evaluating
('Test Accuracy: ', 0.8319600000000003)
```

When ALPHA = 10.0

```
Reading Training Data
Reading Test Data
Computing Parameters
Evaluating
('Test Accuracy: ', 0.8303199999999995)
```

Probability Prediction

Probabilities of first 10 reviews

When ALPHA = 0.1

```
Reading Training Data
Reading Test Data
Computing Parameters
Probability estimated for the first 10 reviews in the test data for ALPHA = 0.1
(1.0, 0.24654141224353898, 0.7534585877564053)
(1.0, 5.1707856652565825e-08, 0.9999999482920443)
(1.0, 0.9964072643368448, 0.003592735663071299)
(1.0, 0.3068155731345781, 0.6931844268654275)
(1.0, 1.1131139060704323e-05, 0.9999888688609453)
(1.0, 4.911390998479076e-20, 1.0)
(1.0, 3.833143268279355e-31, 1.0)
(1.0, 1.0, 3.4354159209699683e-18)
(1.0, 2.316550500012527e-09, 0.999999997683517)
(1.0, 0.3863284699583119, 0.6136715300417047)
None
```

When ALPHA = 0.5

```
Reading Training Data
Reading Test Data
Computing Parameters
Probability estimated for the first 10 reviews in the test data for ALPHA = 0.5
(1.0, 0.009270330589069557, 0.9907296694109236)
(1.0, 2.9791270348031245e-08, 0.9999999702088194)
(1.0, 0.9867055595464279, 0.013294440453475172)
(1.0, 0.05033127674294999, 0.9496687232568262)
(1.0, 0.0006401338376692326, 0.9993598661623463)
(1.0, 2.6690491836616974e-19, 1.0)
(1.0, 1.1511088516545828e-14, 1.0)
(1.0, 1.0, 5.371760436725902e-17)
(1.0, 1.8232064153002157e-08, 0.999999981768042)
(1.0, 0.38404850619248215, 0.6159514938075026)
None
```

When ALPHA = 1.0

```
Reading Training Data
Reading Test Data
Computing Parameters
Probability estimated for the first 10 reviews in the test data for ALPHA = 1.0
(1.0, 0.003682506321622078, 0.9963174936784206)
(1.0, 3.9776289702989794e-08, 0.9999999602237047)
(1.0, 0.9791576631454483, 0.02084233685465691)
(1.0, 0.033216000968771, 0.966783999031316)
(1.0, 0.002451912465943961, 0.9975480875340544)
(1.0, 6.10737157681176e-19, 1.0)
(1.0, 1.4263748309625483e-08, 0.9999999857363947)
(1.0, 1.0, 3.0207862270298463e-16)
(1.0, 5.434640323066037e-08, 0.999999456536003)
(1.0, 0.3812825413141651, 0.6187174586858595)
None
```

When ALPHA = 5.0

```
Reading Training Data
Reading Test Data
Computing Parameters
Probability estimated for the first 10 reviews in the test data for ALPHA = 5.0
(1.0, 0.0018479868941277, 0.9981520131058077)
(1.0, 3.2404246728730583e-07, 0.9999996759575495)
(1.0, 0.9493061235164831, 0.050693876483544786)
(1.0, 0.02619701783516374, 0.9738029821648927)
(1.0, 0.01692876280751284, 0.9830712371924728)
(1.0, 8.745496904751632e-18, 1.0)
(1.0, 0.9936845775469254, 0.006315422453416444)
(1.0, 1.0, 8.807965822701404e-14)
(1.0, 1.0604818783492456e-06, 0.999998939518144)
(1.0, 0.362079095115082, 0.6379209048848943)
None
```

When ALPHA = 10.0

```
\Reading Training Data
Reading Test Data
Computing Parameters
Probability estimated for the first 10 reviews in the test data for ALPHA = 10.0
(1.0, 0.0019150854974288006, 0.9980849145026209)
(1.0, 1.2372499607437508e-06, 0.9999987627500937)
(1.0, 0.9276327352786531, 0.07236726472140598)
(1.0, 0.023764609441489396, 0.9762353905583457)
(1.0, 0.02743077785907292, 0.9725692221409399)
(1.0, 4.697378634028193e-17, 1.0)
(1.0, 0.9999739528811821, 2.604711841853497e-05)
(1.0, 0.9999999999977263, 2.3004510040519912e-12)
(1.0, 4.221260087325854e-06, 0.99999577874)
(1.0, 0.34376232589516786, 0.6562376741048249)
None
```

Precision and Recall

Precision = 0.85

Recall = 0.77

Most 20 Positive and Negative words with their weights:

```
Reading Training Data
Reading Test Data
Most Positive Words
('!', 224.0) ('excellent', 141.0) ('great', 134.0) ('both', 126.0) ('best', 116.0) ('wonderful', 110.0)
('well', 107.0) ('perfect', 105.0) ('job', 103.0) ('bit', 101.0) ('loved', 98.0) ('amazing', 95.0) ('favorite', 91.0)
('highly', 91.0) ('enjoyed', 91.0) ('may', 89.0) ('definitely', 87.0) ('especially', 84.0)
("it's", 82.0) ('each', 82.0)
Most Negative Words
('worst', -201.0) ('waste', -139.0) ('nothing', -113.0) ('bad', -109.0) ('poor', -108.0) ('supposed', -89.0)
('minutes', -84.0) ('looks', -79.0) ('original', -78.0) ('awful', -78.0) ('script', -76.0) ('boring', -75.0)
('poorly', -72.0) ('worse', -71.0) ('stupid', -65.0) ('bad.', -57.0) ('annoying', -57.0) ('terrible', -53.0)
('fails', -50.0) ('money', -50.0)
```