Q1

a) AND b)

```
A Naïve Bayes classifier with bag-of-words features
The average accuracy is : 0.7575996800134731
            precision    recall  f1-score   support

       neg       0.68      0.63      0.65      1368
       pos       0.80      0.83      0.81      2407

 micro avg       0.76      0.76      0.76      3775
 macro avg       0.74      0.73      0.73      3775
weighted avg      0.75      0.76      0.76      3775


A Naïve Bayes classifier with bag-of-ngram features
The average accuracy is : 0.7692616824495034
            precision    recall  f1-score   support

       neg       0.69      0.66      0.67      1368
       pos       0.81      0.83      0.82      2407

 micro avg       0.77      0.77      0.77      3775
 macro avg       0.75      0.74      0.75      3775
weighted avg      0.77      0.77      0.77      3775
```

c) And d)

```
A logical regression classifier with bag-of-words features
The average accuracy is : 0.7615566578607664
              precision    recall  f1-score   support

         neg       0.69      0.61      0.65      1368
         pos       0.79      0.85      0.82      2407

   micro avg       0.76      0.76      0.76      3775
   macro avg       0.74      0.73      0.73      3775
weighted avg       0.76      0.76      0.76      3775


A logical regression classifier with bag-of-ngram features
The average accuracy is : 0.7732306306774392
              precision    recall  f1-score   support

         neg       0.72      0.61      0.66      1368
         pos       0.80      0.87      0.83      2407

   micro avg       0.77      0.77      0.77      3775
   macro avg       0.76      0.74      0.75      3775
weighted avg       0.77      0.77      0.77      3775
```

Bonus

```
Bayes and logical regression classifier with bag-of-words features
The average accuracy is : 0.8283189755952046
              precision    recall  f1-score   support

         neg       0.81      0.68      0.74      1368
         pos       0.84      0.91      0.87      2407

   micro avg       0.83      0.83      0.83      3775
   macro avg       0.82      0.80      0.81      3775
weighted avg       0.83      0.83      0.82      3775


Bayes and logical regression classifier with bag-of-ngram features
The average accuracy is : 0.8452825539857821
              precision    recall  f1-score   support
|
         neg       0.90      0.65      0.75      1368
         pos       0.83      0.96      0.89      2407

   micro avg       0.85      0.85      0.85      3775
   macro avg       0.86      0.80      0.82      3775
weighted avg       0.85      0.85      0.84      3775
```