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### Homework 3: Programing Assignment Report

1. NaiveBayes.py Output:

```
C:\Users\kji51\OneDrive\Desktop\CSE3521-HW_3_Programming\NaiveBayes\NaiveBayes.py:200: RuntimeWarning: divide by zero encountered in log
  probs[c] = probs[c] + np.log(self.conditional[c][x])
Total Sentences correctly: 775
Predicted correctly: 561
Accuracy: 72.3871%
```

2. NaiveBayes\_improved.py Output: **N/A**

```
Total Sentences correctly: 775
Predicted correctly: 658
Accuracy: 84.90323%
```

3. The error was occurring when calculating the self.conditional value. Because it was possible that the total number of labels for a class is 0, the runtime error occurred. To fix this I added to the denominator the number of words in the dictionary. However, in order to compensate for this addition, I also added 1 to the numerator. This small adjustment eliminates the possibility of zero being in the denominator as the dictionary should always be nonzero.