Intermediate Report

Automatic Essay Grading System

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In order to analyze the Essay grading system we built, we first used the given equation to calculate the final score for all the essays in the training set:

$$\text{FinalScore} = 2 * a - b + ci + cii \; [+ciii + di + dii]$$

The system in this case showed 0.92 recall for low grade class and 0.96 recall for high grade essays.

Using R, we ran multiple regression model on the feature vector for the complete training data. Since, the expected final score of the essays in the training set was unknown, we decided to to use the high – low grades on a numeric scale (high = 2, low = 1).

From the summary of the model obtained for FS ~ a + b + ci +cii we obtained the coefficients for our independent variables. The equation substituting these coefficients was the following:

$$\text{FinalScore} = (0.27309 * a) - (0.14183 * b) - (0.21198 * ci) + (0.02764 * cii)$$

Using this equation recall value of low essays remained 0.92 and recall for high essays increased to 0.98.

We then decided to test the system by dividing the corpus we have into 80% training corpus and 20% development corpus (equally distributed high and low grade files in each). We used linear regression again on the training corpus and obtained the following coefficient for the equation:

$$\text{FinalScore} = (0.22131 * a) - (0.15951 * b) - (0.27341 * ci) + (0.01245 * cii)$$

With this equation we tested our development corpus (20 essays) and received 100% recall incase of high essays and 0.8 recall value in case of low essays.

We hope this will improve once our system has all the other features.