Milestone Week 2: Requirements and Evaluation Criteria

Project Description

The purpose of this project is to determine a suitable method for comparing the semantic meaning of sentences and paragraphs. Specifically, whether a paragraph is a suitable rewrite of the original paragraph. Different methods for comparing the semantic relatedness of two texts will be compared. The ideal candidate should be able to compare a paragraph against another paragraph. However, I will still examine methods that may compare sentence-to-paragraph, sentence-to-sentence, and word-to-word and consider whether they could be expanded to produce a paragraph-to-paragraph comparison. The resulting system will be used on a website for improving reading comprehension. The students are asked to rewrite in their own words a given paragraph. The system will ensure they do a reasonable job and provide feedback to the student.

Existing Systems

The following methods will be investigated:

- Latent Semantic Analysis (LSA)
- Pointwise mutual information (PMI)
- WordNet
- Normalized Search Similarity (NSS)

Requirements

- A paragraph or more of text will be input to the system as a reference
- A paragraph written by the user will be input to the system as well
- The system will compare the two to determine how similar they are
  - This can be done in two ways
    - Compare one sentence/paragraph to the whole reference
    - Compare all words in a sentence to one sentence in the reference
- The system will output to the user a message saying the paragraph is good or is not good enough

Evaluation Criteria

Word-to-word evaluation
• Randomly generated test case will be produced in the format (cue, [targets], [distracters])
• The target words were judged by humans as having a strong connection to the cue word where as the distracters do not have a connection to the cue.
• An overall percentage will be produced where 100% means that when compared to the cue, the method returned a higher value for all the targets against the distracters.

Multiword-to-multiword evaluation

• A sample paragraph from my project will be used as a testing measure.
• They will be input in two ways: as a whole paragraph and each sentence individually
• They will also be compared in two ways: to an individual sentence and the whole paragraph
• The system will produce a value determining the similarity to the referenced material
• The system should correctly distinguish various degrees of paragraphs from off-topic to almost the exact same words

Schedule

Week 4: Theoretical comparison of methods. Determine the strengths and weakness of each method.

Week 6: Word-to-word comparison of methods. Sample implementations of available methods will be compared.

Week 8: Multiword-to-multiword comparisons. Only LSA can do this so I will compare sentence-to-sentence, sentence-to-paragraph, and paragraph-to-paragraph.

Week 10: Conclusion. I will report my findings and determine the most suitable method for my project.