W9 Assignment – Distributional Semantics

Computational Linguistics

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1 Concepts

1.1 Homonymy and Polysemy

Regarding the concepts of homonymy and polysemy, we could say that...

(choose *TRUE* or *FALSE*)

a) Polysemic words are words with a single meaning

`answer:` _____

b) Homonymous words have meanings that are related

`answer:` _____

c) If two words are homonymous, then they are written/pronounced the same, but have unrelated meanings

`answer:` _____

d) Homonymous words are synonyms (i.e., homonymous words are words with the same meaning)

`answer:` _____

e) Polysemic words are synonyms (i.e., homonymous words are words with the same meaning)

`answer:` _____

f) Homonymous words are words with opposite meanings

`answer:` _____

g) Polysemic words are words with opposite meanings

`answer:` _____

h) Homonymy and polysemy are just the same thing

`answer:` _____

i) A polysemic word is a word with multiple meanings that are related (a.k.a. "multiple senses")

`answer:` _____

1.2 Examples

Consider the following sentences

(1) He was a kind man

(2) What kind of sorcery is this?

(3) I'll pay in kind for his insult.

The usages of kind in the sentences (1) and (2) are an example of _____

The usages o kind in the sentences (2) and (3) are an example of _____

2 Co-occurrence matrix and its uses

2.1 Co-occurrence matrix

Consider the following sentences: (which I am randomly writing, without any thought)

```
The quick brown fox and the lazy dog were never the same.
The brown fox jumped over the lazy dog several times over
and over again. But the lazy dog ignored it forever.
```

Using a vocabulary of 5 words, construct a co-occurrence matrix and input the vectors associated with each of the following words:

`dog:` _____

`jumped`: _____

`lazy`: _____

2.2 Cosine Similarity

Let's assume that the following vectors were the correct answer for the previous questions

`dog:` `[5,2,3,4,1]`

`jumped:` `[3,3,0,1,0]`

`lazy:` `[5,2,3,4,2]`

Calculate the cosine similarity between the following pairs of words:

cos(`dog` ,`jumped`): _____

cos(`dog` ,`lazy`): _____

cos(`jumped`,`lazy`): _____