

Q8

Two new relation groups were created titled 'antonyms' and 'synonyms'. Three analogies were created for each of the two relation groups.

: antonyms

public private large tiny

big small near far

public private big small

: synonyms

big large small tiny

little small fast quick

tough hard simple easy

The resulting vectors obtained for each of the analogies and observations are as follows:

RELATION GROUP: antonyms

Analogy: ['public', 'private', 'large', 'tiny']

Nearest words: [('earth', 0.43337006202574685), ('color', 0.40557256812122705), ('light', 0.40358688909559709), ('water', 0.3886666216647644), ('ocean', 0.36467369653221615), ('wide', 0.36322861909208526), ('sun', 0.36092870310175651), ('full', 0.35926871926769033), ('dark', 0.35916099951772013), ('walls', 0.35871478930452833)]

Observation: Here, the correct antonym did not occur in the top ten results. The 10 words predicted were nouns that are completely irrelevant to the analogy.

Analogy: ['big', 'small', 'near', 'far']

Nearest words: [('much', 0.66324356172581578), ('well', 0.53211588691482092), ('fast', 0.52302947254206744), ('obviously', 0.4684712041143243), ('just', 0.45310865848356846), ('obvious', 0.44932192026643902), ('long', 0.41833987446533061), ('bad', 0.41534518283236743), ('easily', 0.40788259521542841), ('clearly', 0.40582246433103158)]

Observation: Here, the correct antonym did not occur in the top ten results. The 10 words predicted were again completely irrelevant to the analogy.

Analogy: ['public', 'private', 'big', 'small']

Nearest words: [('large', 0.51357904494348183), ('broad', 0.44269939551165755), ('poor', 0.43847961260878193), ('wide', 0.43456838574302786), ('full', 0.41956329503002876), ('vast', 0.41290218507159404), ('significant', 0.39925750210080269), ('larger', 0.39092566397442857), ('such', 0.38813168165785694), ('tiny', 0.38473969004269498)]

Observation: Here, the correct antonym did not occur in the top 10 results. The expected word was 'big', however a synonym of the expected word 'large' was returned.

RELATION GROUP: synonyms

Analogy: ['big', 'large', 'small', 'tiny']

Nearest words: [('dirty', 0.59992615485313605), ('bright', 0.59217709858113088), ('weird', 0.57755198248523321), ('fancy', 0.5663327128098451), ('hot', 0.56233474961618601), ('pink', 0.55474668085177037), ('cute', 0.54888465759386407), ('gorgeous', 0.54534090946982494), ('wild', 0.54503880723213327), ('fantastic', 0.53761530427569482)]

Observation: Here, the correct antonym did not occur in the top ten results. The 10 words predicted were not relevant to the analogy. Basically, a set of 10 adjectives were returned.

Analogy: ['little', 'small', 'fast', 'quick']

Nearest words: [('nothing', 0.54268450115798395), ('something', 0.49957062844769778), ('anything', 0.47974312251668172), ('torre', 0.47016201210591552), (''what'', 0.45213493473934924), ('luck', 0.44515990255899179), ('tough', 0.44113799622711375), ('good', 0.4402268836810117), ('everybody', 0.43812421361792186), ('me', 0.43364618379515185)]

Observation: Here, the correct antonym did not occur in the top ten results. The 10 words predicted were completely irrelevant to the analogy and a set of random nouns are got.

Analogy: ['tough', 'hard', 'simple', 'easy']

Nearest words: [('honest', 0.57986153367527227), ('obvious', 0.56003085328412805), ('interesting', 0.53499022103176763), ('stupid', 0.53206176484795831), ('incredible', 0.52594620583863494), ('smart', 0.52075171694798261), ('friendly', 0.51567870210101241), ('unusual', 0.51537330231822354), ('exciting', 0.51356838932015836), ('nice', 0.51271809399241441)]

Observation: Here, the correct antonym did not occur in the top ten results. The 10 words predicted were completely irrelevant to the analogy. Yet again, a set of random nouns are predicted.

In conclusion, if the pair on the left side of the analogy has sufficient contexts, then the third word in the analogy is predicted accurately. Also, sometimes synonyms of the third word are predicted for some analogies. However, in most cases a set of random words are being returned.

The prediction accuracy is as follows:

relation-group	best-1	best-5	best-10
antonyms	0.0	0.0	0.0
synonyms	0.0	0.0	0.0