

Answer 4. (a)

(a) The two three word query are as follows:

First Query: "Time heals everything"

Second Query: "Death before dishonor"

Search Engine Used: Bing

Estimation of the result on the first query

Search engine results for three-word query; two word query and single word query are as below:

"Time heals everything": 10,900,000

"Time everything": 136,000,000

"Heals everything": 12,600,000

"Everything": 185,000,000

Now let find out the estimation result of the three-word query using the two words and single word query result data.

$$\int time \cap heals \cap everything = \int time \cap everything * \int heals \cap everything / \int everything$$

$$\Rightarrow 136,000,000 * 12,600,000 / 185,000,000$$

$$\Rightarrow 9,262,702$$

Estimation result of three-word query after calculation is 9,262,702 and Search engine result for three-word query is 10,900,000, which are very close approximate results. Since the two words query also make sense that's why the estimation is coming nearby to the result we achieved from search engine.

Estimation of the result on the Second query

Search engine results for three-word query; two word query and single word query are as below:

"Death before dishonor": 662,000

"Death dishonor": 926,000

"Before dishonor": 1,170,000

"Dishonor": 2,260,000

Now let find out the estimation result of the three-word query using the two words and single word query result data.

$$\int death \cap before \cap dishonor = \int death \cap dishonor * \int before \cap dishonor / \int dishonor$$

$$\Rightarrow 926,000 * 1,170,000 / 2,260,000$$

$$\Rightarrow 479,389$$

Estimation result of three-word query after calculation is 479,389 and Search engine result for three-word query is 662,000, which are very close approximate results. As after dividing the three-word query into two-word query, which is little, bit ambiguous to the search engine that's why the estimate is not that close to the result, which we got from the search engine.

After analyzing the results given by the search engine for the three-word, two word and one word query, we can conclude that three word query makes more sense than two and single word query so the search engine results for three-word query is very less compare to the two or one word query. We can see that one word query seems to be very ambiguous to the search engine, which results in lots of documents.