2. Interpret that table. You will learn after break about these retrieval models. To a first approximation: QL is a straightforward estimate of term probability in a document; BM25 is a more complicated combination of features such as the frequency of a term in the document and across the collection, document length, and so on; and that DPR is the dense passage retrieval neural model. Speculate on the reason for the results you are seeing. (If you're curious, you can find information about QL and BM25 in the textbook; DPR is not there.)

Ans: The percentage difference between BM25 and QL is much smaller than the percentage difference between DPR and QL. QL is effective for short queries. DPR is showing much higher numbers in this task. BM25 seems to be in the middle of QL and DPR and seems to be the most usable model.

3. How do you calculate the MAP of a query with no retrieved documents? Why is this a hard question? Argue for what you think the answer should be.

Ans: The AP is a measure of the precision of the retrieval set at each relevant document rank position, and the MAP is the average of these values across all relevant documents for a given query. If there are no relevant documents retrieved, then the AP for that query is undefined, and consequently, the MAP for that query cannot be calculated. So, the assumption would be to set 0 as default for MAP values with 0 retrieved documents.

4.