1. Report:

(i) **Describe the steps you have performed for data preprocessing** and **provide answers** for the following questions.

(a) How many tokens does the corpus contain before stopword removal and stemming?

2859563

(b) How many tokens does the corpus contain after stopword removal and stemming?

2234287

(c) How many terms (unique tokens) are there before stopword removal, stemming, and case-folding?

54247

(d) How many terms (unique tokens) are there after stopword removal, stemming, and case-folding?

43360

(e) List the top 20 most frequent terms before stopword removal, stemming, and case-folding?

0 : the : 144424
1 : of : 73606
2 : to : 73074
3 : in : 54939
4 : and : 54545
5 : said : 53096
6 : a : 52018
7 : s : 32592
8 : for : 27307
9 : mln : 26732
10 : it : 22882
11 : 3 : 21874
12 : dlrs : 21273
13 : on : 19392
14 : reuter : 18964
15 : pct : 18046
16 : is : 16875
17 : lt : 16680
18 : that : 15527
19 : from : 15277
20 : by : 15154
21 : its : 14995
22 : will : 14855
23 : vs : 14836
24 : be : 14738
25 : at : 14517

(f) List the top 20 most frequent terms after stopword removal, stemming, and case-folding?

0 : to : 73074
1 : said : 53096
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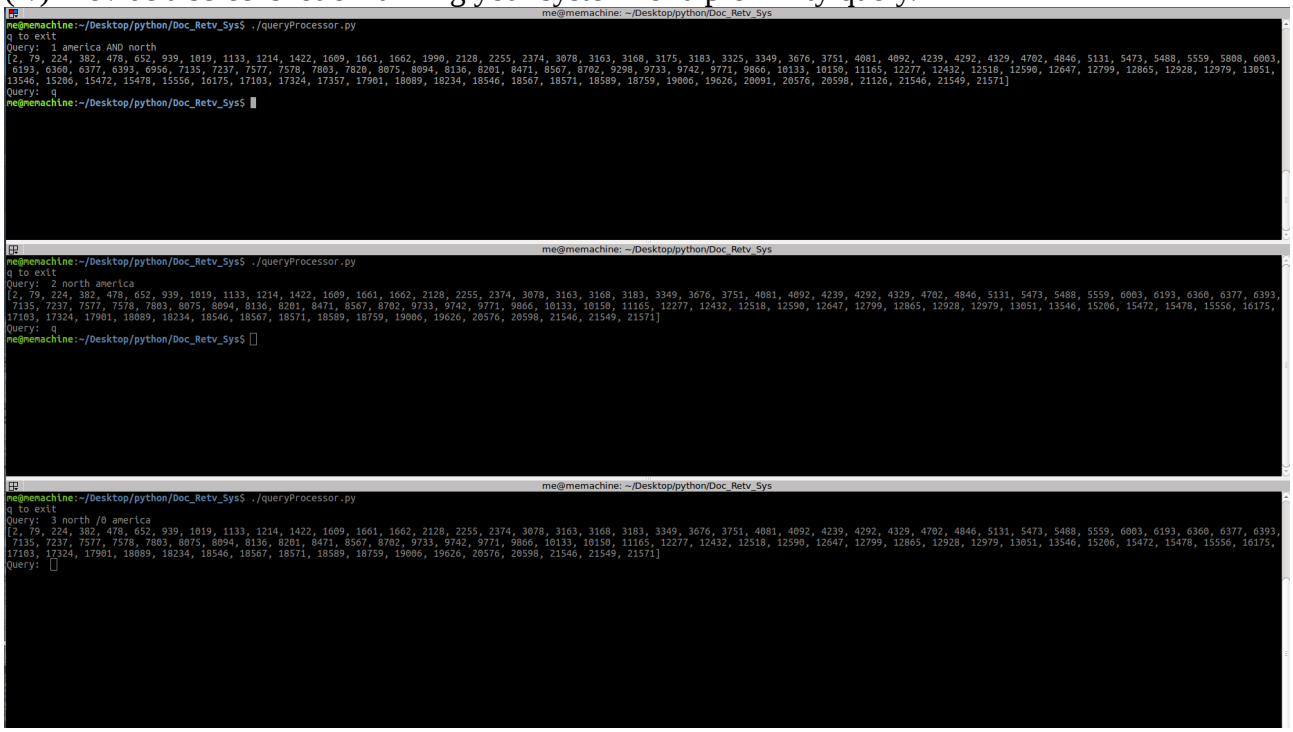
11 : from : 15277
12 : by : 15154
13 : vs : 14836
14 : at : 14517
15 : 000 : 13438
16 : year : 13109
17 : u : 11326
18 : billion : 10726
19 : has : 10185
20 : company : 9699
21 : cts : 9219
22 : would : 9200
23 : not : 8308
24 : inc : 8161
25 : bank : 8018

(ii) Describe the data structures that you used for representing the positional index (dictionary and postings).

It is dictionary as {tokenID : {docID : invIndexItem}}
that is keys are tokenID's and vales are dictionaries whose keys are docIDs and values are invIndexItem's. Where an invIndexItem is basically a container as (docID , list(positional indexes))
Using dictionaries give robust speed where also wastes some space but, that is not a concer for this case. (Tried dict of list too but took too, long apx 30minutes, to execute.)

(iii) Provide a screenshot of running your system for a conjunctive query.
(iv) Provide a screenshot of running your system for a phrase query.
(iv) Provide a screenshot of running your system for a proximity query.



2. Source code and executable: Commented source code and executables of your document retrieval system.

Provided as separate files.

3. Readme: Detailed readme describing how to run your program.

Program is coded and tested on Ubuntu 16.04 with python3
There is nothing unusual about it.
There are two files:

preprocess.py : takes care of forming dictionary.txt and invertedIndex.txt
queryProcessor.py : runs the queries on these two files generated by preprocess.py

Plus stemmer.py from provided website for porter stemmer.

These three files should be in the same directory.

On terminal (on the directory where the files live) :
Either change permissoin (chmod +x preprocess.py queryProcessor.py)
Then run them in order:

```
./preprocess.py          (takes 33 secs or so on my machine)
./queryProcessor.py    (takes 5 or 10 secs to load data)
```

queryProcessor will be in a infinite loop asking for queries, press q and hit enter to exit.
Write your query and hit enter to do queries. Format is the same as you wanted.
Note: <querytype> must be an integer (1 or 2 or 3) and must be the first character of the query, no white spaces etc before query type please.

PS: you can give an argument if you don't want to process all the 22 sgm files
for example: `$ ./preprocess 3` would preprocess only 3 files `reut2-000.sgm, reut2-001.sgm, reut2-002.sgm`.

PS: SGM files should be under directory called Dataset which should be next to our .py files.