TDT4117 Information Gathering

Assignment 5

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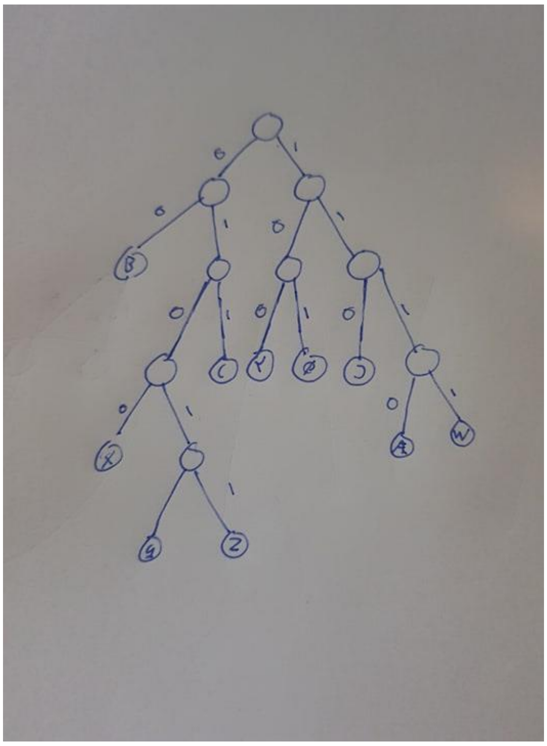
Task 1-1: Text Compression with Huffman code

J=39	J = 100111	Q = 101
Q=5	Q = 101	Z = 1010
W=22	W = 10110	X = 1100
X=12	X = 1100	Æ = 10010
Y=31	Y = 11111	W = 10110
Z=10	Z = 1010	C = 11011
B=41	B = 101001	Y = 11111
Æ=18	Æ = 10010	Ø = 100011
C=27	C = 11011	J = 100111
Ø=35	Ø = 100011	B = 101001

Huffman Tree

(‘Q’,3,101), (‘Z’,4,1010), (‘X’,4,1100), (‘Æ’,5,10010), (‘W’,5,10110), (‘C’,5,11011), (‘Y’,5,11111), (‘Ø’,6,100011), (‘J’,6,100111), (‘B’,6,101001),



Average length of code: (3+4+4+5+5+5+5+6+6+6)/10 = 4.9

Task 1-2:

Input :101110101111111100011000001000111111001

Starting from the left side, look for a unique length of bits that fit the code for a letter

Start: 101110101111111100011000001000111111001

101110101111111100011000001000111111001 = H

Remove 1011 from string

10101111111100011000001000111111001 = E

Remove 1010 from string

1111111100011000001000111111001 = L

Remove 1111 from string

111100011000001000111111001 = L

Remove 1111 from string

00011000001000111111001 = O

Remove 000 from string

110000010001111001 = W

Starting to look like “Hello World..”

Remove 1100 from string

00010001111001 = O

Remove 000 from string

10001111001 = R

Remove 1000 from string

1111001= L

Remove 1111 from string

0011 = D

Remove 001

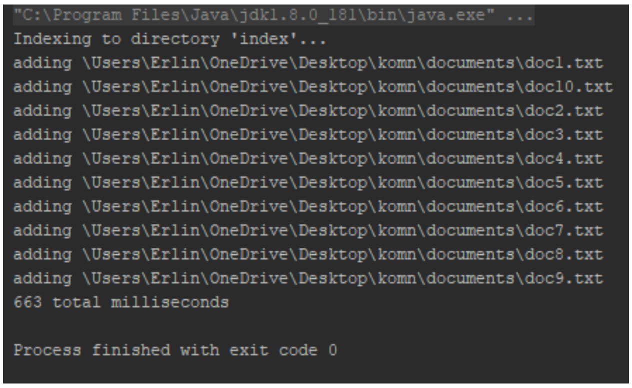
Solution = “Hello World”

Task 2: Index Analysis Using Lucene

1. Lucene is a text search engine library. Without going too much into detail it is a technology that is suitable for nearly any application that requires text search. It has many advantages, like high speed, ranked searching, many query types, fielded searching and so on. It also works cross platform with Java.

I didn’t get the program to work with Lucene 7.5.0 because “LongField” was outdated, I went back a few versions and found Lucene 5.5 to work fine, therefore I used it instead.

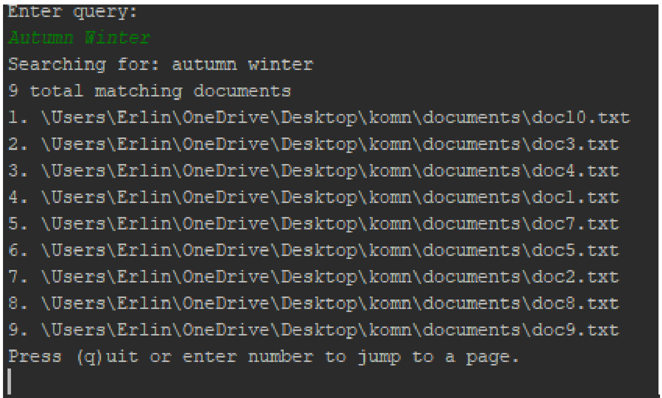
2.



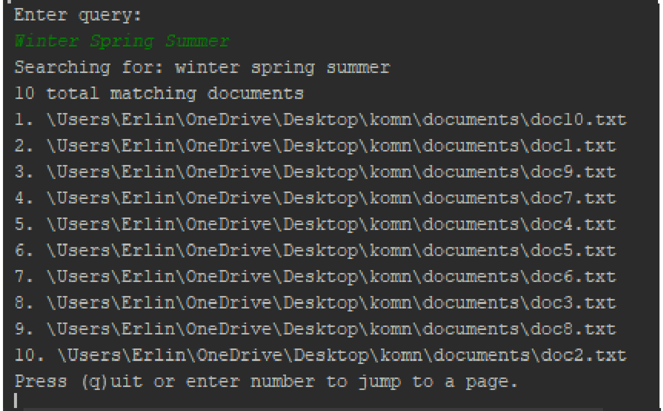
```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe" ...
Indexing to directory 'index'...
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc1.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc10.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc2.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc3.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc4.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc5.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc6.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc7.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc8.txt
adding \Users\Erlin\OneDrive\Desktop\komn\documents\doc9.txt
663 total milliseconds

Process finished with exit code 0
```

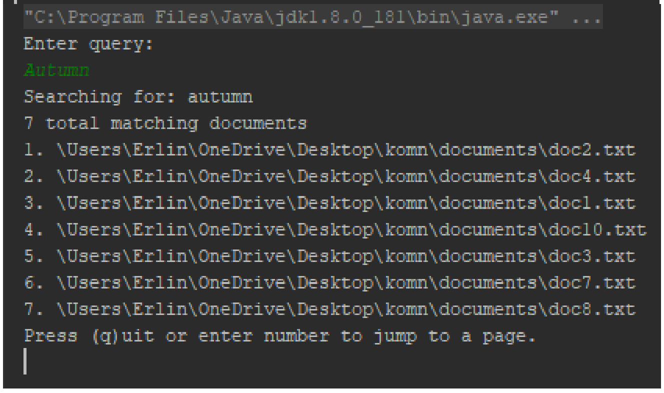
3. Autumn, Autumn Winter and Winter Spring Summer queries



```
Enter query:
Autumn Winter
Searching for: autumn winter
9 total matching documents
1. \Users\Erlin\OneDrive\Desktop\komn\documents\doc10.txt
2. \Users\Erlin\OneDrive\Desktop\komn\documents\doc3.txt
3. \Users\Erlin\OneDrive\Desktop\komn\documents\doc4.txt
4. \Users\Erlin\OneDrive\Desktop\komn\documents\doc1.txt
5. \Users\Erlin\OneDrive\Desktop\komn\documents\doc7.txt
6. \Users\Erlin\OneDrive\Desktop\komn\documents\doc5.txt
7. \Users\Erlin\OneDrive\Desktop\komn\documents\doc2.txt
8. \Users\Erlin\OneDrive\Desktop\komn\documents\doc8.txt
9. \Users\Erlin\OneDrive\Desktop\komn\documents\doc9.txt
Press (q)uit or enter number to jump to a page.
```



```
Enter query:
Winter Spring Summer
Searching for: winter spring summer
10 total matching documents
1. \Users\Erlin\OneDrive\Desktop\komn\documents\doc10.txt
2. \Users\Erlin\OneDrive\Desktop\komn\documents\doc1.txt
3. \Users\Erlin\OneDrive\Desktop\komn\documents\doc9.txt
4. \Users\Erlin\OneDrive\Desktop\komn\documents\doc7.txt
5. \Users\Erlin\OneDrive\Desktop\komn\documents\doc4.txt
6. \Users\Erlin\OneDrive\Desktop\komn\documents\doc5.txt
7. \Users\Erlin\OneDrive\Desktop\komn\documents\doc6.txt
8. \Users\Erlin\OneDrive\Desktop\komn\documents\doc3.txt
9. \Users\Erlin\OneDrive\Desktop\komn\documents\doc8.txt
10. \Users\Erlin\OneDrive\Desktop\komn\documents\doc2.txt
Press (q)uit or enter number to jump to a page.
```



```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe" ...
Enter query:
Autumn
Searching for: autumn
7 total matching documents
1. \Users\Erlin\OneDrive\Desktop\komn\documents\doc2.txt
2. \Users\Erlin\OneDrive\Desktop\komn\documents\doc4.txt
3. \Users\Erlin\OneDrive\Desktop\komn\documents\doc1.txt
4. \Users\Erlin\OneDrive\Desktop\komn\documents\doc10.txt
5. \Users\Erlin\OneDrive\Desktop\komn\documents\doc3.txt
6. \Users\Erlin\OneDrive\Desktop\komn\documents\doc7.txt
7. \Users\Erlin\OneDrive\Desktop\komn\documents\doc8.txt
Press (q)uit or enter number to jump to a page.
```

I believe Lucene uses a vector space query model combined with the Boolean model for this query.

4. Query for NTNU returned one result: maildir\lay-k\inbox\1126

   Time used: 11ms

   Query for “Fireworks” surprisingly returned 140 results

   Time used: 6ms

Query for “League of Legends” returned 2237 results, this may be because of the word “of”

Time used 23ms

Query for “Erling” returned 17 results

Time used:15ms

Query for “What does the fox say woof woof woof” returned 123158 results

Time used: 55ms