Assignment1

Natural Language Processing

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Part1:

a)Submit a file microblog2011_tokenized.txt with the tokenizer's output for the whole corpus. Include in your report the output for the first 20 sentences in the corpus.

1.Use the white space to tokenizer the corpus.
2.In the program, the user can choose whether corpus the whole txt file or the first 20 sentences by entering 1 or 2
3.The result:

```
Save
BBC
World
Service
from
Savage
Cuts
http://www.petitionbuzz.com/petitions/savews
a
lot
of
people
always
make
fun
about
the
end
of
the
world
but
the
question
is.."ARE
```

U
READY
FOR
IT?..
ReThink
Group
positive
in
outlook:
Technology
staffing
specialist
the
ReThink
Group
expects
revenues
to
be
“marg...
http://bit.ly/hFjtmY
'Zombie'
fund
manager
Phoenix
appoints
new
CEO:
Phoenix
buys
up
funds
that
have
been
closed
to
new
business
and
...
http://bit.ly/dXrlH5
Latest::
Top

World
Releases
http://globalclassified.net/2011/02/top-world-releases-2/
CDT
presents
ALICE
IN
WONDERLAND
-
Catonsville
Dinner
has
posted
'CDT
presents
ALICE
IN
WONDERLAND'
to
the...
http://fb.me/GMicayT3
Territory
Manager:
Location:
Calgary,
Alberta,
CANADA
Job
Category:
bu...
http://bit.ly/e3o7mt
#jobs
I
cud
murder
sum1
today
n
not
even
flinch
I'm
tht
fukin

angry
today
BBC
News
-
Today
-
Free
school
funding
plans
'lack
transparency'
-
http://news.bbc.co.uk/today/hi/today/newsid_9389000/9389467.stm
…
Manchester
City
Council
details
saving
cuts
plan:
http://bbc.in/fYPYPC
...Depressing.
Apparently
we’re
4th
most
deprived
&
top
5
hardest
hit
http://bit.ly/e0ujdP,
if
you
are
interested
in
professional
global
translation

services
Fitness
First
to
float
but
isn't
the
full
service
model
dead
?
http://bit.ly/evflEb
David
Cook
!
http://bit.ly/fkj2gk
has
the
mostest
beautiful
smile
in
the
world!
Piss
off.
Cnt
stand
lick
asses
BEWARE
THE
BLUE
MEANIES:
http://bit.ly/hu8iJz
#cuts
#thebluemeanies
Como
perde
os
dentes
no

World
Of
Warcraft
-
Via
Alisson
http://ow.ly/1beBPo
How
exciting!
RT
@BunchesUK:
Hello!
What's
happening
in
your
world?
We're
all
gearing
up
for
#Valentines
with
bouquets
flying
out
the
door.
I'd
very
much
appreciate
it
if
people
would
stop
broadcasting
asking
me
to
add
people

on
BBM.
@samanthaprabu
sam
i
knw
u
r
a
cricket
fan
r
u
watching
any
of
the
world
cup
matches
John
Baer:
Who
didn't
see
this
coming?:
TO
THOSE
who
know
Ed
and
Midge
Rendell
-
heck,
to
the
Philly
world
at
la...
http://bit.ly/ii6WEO

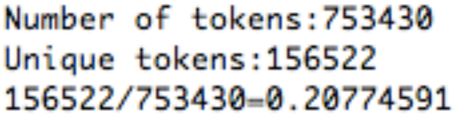
b)How many tokens did you find in the corpus? How many types (unique tokens) did you have? What is the type/token ratio for the corpus? The type/token ratio is defined as the number of types divided by the number of tokens.

1.Use white space to split the corpus, get all the tokens

2.Use hashmap to get the number of the unique tokens(the first time one token add to the hashmap, the unique add 1)

3.get the ratio

4.the result:



```
Number of tokens:753430
Unique tokens:156522
156522/753430=0.20774591
```

c)For each token, print the token and its frequency in a file called Tokens.txt (from the most frequent to the least frequent) and include the first 100 lines in your report.

1.Use hashmap to store the frequency and the token

2.Use white space to split the tokens

3.the result:

```
the 15778
to 12644
of 9872
in 9418
a 8580
- 7548
and 7518
for 6278
on 5513
is 5292
I 5114
The 4432
RT 4203
at 3501
with 2626
you 2615
& 2425
```

```
my 2387
that 2303
... 2098
from 2049
are 2020
be 1965
it 1878
by 1679
Egyptian 1663
have 1641
this 1600
will 1567
New 1485
A 1481
has 1430
| 1410
as 1399
not 1369
your 1327
just 1251
State 1224
was 1209
out 1202
me 1180
I'm 1177
new 1152
Super 1138
about 1110
Obama 1109
an 1079
like 1069
Egypt 1048
all 1034
via 1026
but 1013
de 987
#Egypt 981
i 976
up 954
News 948
2 944
Bowl 941
get 921
… 914
```

```
so 909
In 890
can 866
To 860
or 849
US 835
they 822
his 799
we 789
do 780
Social 769
White 762
no 744
Union 739
now 735
#Jan25 724
who 717
2011 716
more 713
people 684
President 676
if 663
what 659
You 655
World 652
For 651
our 650
love 619
: 613
Media 606
when 595
says 584
#jan25 578
their 575
My 574
its 573
some 567
This 564
– 562
one 561
```

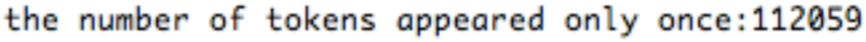
d)How many tokens appeared only once in the corpus?

1.the token first appear, add 1 to the number

2.the token appear the second time, minus 1 to the number

3.the token appear more than two times, do nothing

4.the result:



```
the number of tokens appeared only once:112059
```

e)From the list of tokens, extract only words, by excluding punctuation and other symbols. How many words did you find? List the top 100 most frequent words in your report, with their frequencies. What is the type/token ratio when you use only word tokens?

1.replace all the other symbols and punctuation to null

2.using string.replaceAll("[^a-zA-Z]","");

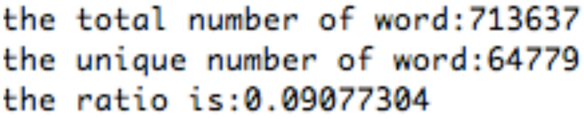
3.the top 100 most frequent words and their frequencies:

```
the 21031
to 13844
in 10716
of 10554
a 10397
and 8313
for 7091
i 6323
on 6241
is 6074
rt 4448
at 3909
you 3737
with 3136
my 3103
egypt 3086
it 2981
new 2954
that 2696
news 2546
from 2466
this 2422
are 2363
be 2260
```

```
us 2145
by 2038
will 1924
egyptian 1879
have 1863
not 1846
your 1814
me 1774
state 1762
just 1732
jan 1717
as 1686
out 1601
im 1568
has 1560
its 1523
no 1494
all 1490
obama 1456
we 1427
now 1412
super 1390
so 1387
an 1374
up 1357
was 1333
via 1320
social 1312
media 1308
like 1292
get 1280
white 1277
about 1275
world 1267
what 1263
but 1233
if 1209
can 1137
more 1110
do 1104
how 1097
de 1092
union 1043
they 1026
```

```
people 1009
security 1007
airport 991
love 983
or 978
u 973
day 960
release 948
his 915
one 912
who 903
time 897
dont 890
today 880
good 879
video 869
house 860
jobs 859
over 847
show 837
service 817
our 814
he 791
go 782
mubarak 770
cairo 769
```

4.total words:713637, unique words:64779, the result:



```
the total number of word:713637
the unique number of word:64779
the ratio is:0.09077304
```

f)From the list of words, exclude stopwords. List the top 100 most frequent words and their frequencies. You can use this list of stopwords (or any other that you consider adequate).

1.If the word is in the list, delete it, do not add that word to the hashmap

2.the result:

```
rt 4448
egypt 3086
news 2546
egyptian 1879
```

```
state 1762
jan 1717
obama 1456
super 1390
social 1312
media 1308
bowl 1280
white 1277
world 1267
union 1043
people 1009
security 1007
airport 991
love 983
release 948
president 915
dont 890
today 880
video 869
house 860
jobs 859
protests 837
service 817
mubarak 770
cairo 769
job 768
lol 743
energy 735
police 718
global 707
phone 701
free 679
dog 673
taco 664
back 660
bbc 641
protesters 635
return 630
live 623
bell 616
rite 613
special 611
toyota 597
know 594
```

```
here 557
think 556
court 539
crash 523
health 522
twitter 521
tv 519
cuts 512
watch 507
budget 505
man 497
weather 496
pm 493
top 490
home 488
business 485
cant 472
online 470
post 469
th 464
food 463
tcot 457
organic 452
blog 448
right 447
attack 446
car 444
peace 434
help 418
big 415
protest 408
pakistan 402
haiti 395
fifa 394
government 384
reuters 383
life 382
mexico 381
work 380
recovery 376
date 373
jordan 372
```

g)Compute all the pairs of two consecutive words (excluding stopwords and punctuation). List the most frequent 100 pairs and their frequencies in your report.

1.Use a hashmap that contains another hashmap

2.The first hashmap contains the first word and the second hashmap, the second hashmap contains the second word and the frequency

3.Get the high frequency of the two consecutive words

4.the result:

```
f at : 152
a good : 155
a new : 309
i will : 142
i can : 133
i just : 321
i need : 151
i think : 206
i am : 259
i dont : 256
i love : 261
i was : 162
i want : 156
i have : 242
go to : 137
do you : 173
by the : 173
be a : 145
at least : 196
at the : 534
as a : 145
as the : 128
al jazeera : 220
of a : 264
of my : 130
of the : 2420
on a : 206
on my : 194
on the : 973
if you : 325
is a : 486
is not : 151
is the : 431
it was : 136
it is : 195
im at : 157
im not : 121
in a : 369
in egypt : 598
in cairo : 263
in my : 176
in the : 1473
we are : 161
to a : 145
to make : 167
to get : 311
to see : 171
to go : 186
to do : 139
to be : 558
to the : 817
president barack : 132
president obama : 199
return to : 193
keith olbermann : 239
about the : 170
right now : 132
rite now : 144
more than : 155
rahm emanuel : 175
press release : 143
bowl xlv : 209
want to : 231
barack obama : 162
super bowl : 1186
winds are : 147
with a : 224
with the : 295
will be : 413
when i : 139
thousands of : 178
check out : 162
protests in : 159
need to : 242
budget cuts : 142
world cup : 206
```

```
hosni mubarak : 123
white house : 358
white stripes : 198
supreme court : 121
state of : 1063
tahrir square : 121
egypt jan : 327
egypt protests : 136
union address : 361
united states : 174
taco bell : 532
this is : 265
that the : 154
customer service : 138
time to : 121
julian assange : 135
moscow airport : 192
release of : 163
bbc news : 183
but i : 133
and a : 166
and i : 169
and the : 400
all the : 190
are you : 135
from the : 384
jan egypt : 321
has a : 127
has been : 214
how to : 311
for a : 455
for the : 730
going to : 276
due to : 128
have a : 274
have to : 172
new post : 120
new york : 341
out of : 265
global warming : 308
one of : 188
you can : 165
you are : 156
way to : 141
```

```
via addthis : 163
the super : 248
the world : 369
the white : 276
the best : 223
the most : 140
the us : 191
the new : 243
the state : 379
the same : 132
the rite : 171
the union : 894
the egyptian : 367
the first : 141
the last : 131
health care : 157
like a : 168
social media : 974
```

Part2:

a) Submit a file POS_results.txt with the tagger's output for the whole corpus. Include in your report the POS tagger's output for the first 20 sentences in the corpus.

We used GATE Twitter POS tagger

The result for the first 20 sentences:

```
DREAM_NN
Too_RB much_JJ hw_NN
high_JJ school_NN is_VBZ weird_JJ
I_PRP feel_VBP .._: Blah_UH ._.
I_PRP Love_VBP One_CD Direction_NN
Can_MD I_PRP make_VBP a_DT pie_NN with_IN potatoes_NNS ?_.
After_IN so_RB many_JJ days_NNS of_IN just_RB trying_VBG ,_, finally_RB
made_VBD it_PRP of_IN bed_NN for_IN a_DT run_NN at_IN 6_CD ._. Hah_UH
I_PRP ca_MD n't_RB express_VB how_WRB I_PRP feel_VBP in_IN a_DT text_NN !_.
Finally_RB
@smosh_USR awesome_JJ about_IN food_NN battle_NN 2012_CD
I_PRP should_MD probably_RB finish_VB my_PRP$ homework_NN
I_PRP 'm_VBP so_RB sleepy_JJ right_RB now_RB !_. !_. #earlybedtime_HT
Life_NN 's_POS most_RBS important_JJ promises_NNS might_MD never_RB be_VB
```

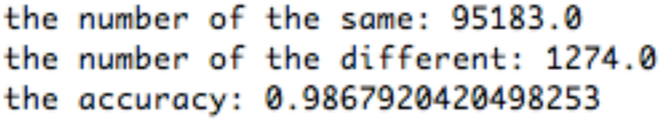
spoken_VBN ._.
@JCSweetGirl_USR Hi_UH !_.
@nessamaders_USR aaaawn_UH *-*_UH
@djherrold_USR just_RB ask_VB if_IN you_PRP can_MD get_VB a_DT picture_NN with_IN him_PRP ._. I_PRP 'm_VBP sure_JJ it_PRP 'll_MD make_VB his_PRP$ day_NN ._.
Me_PRP beating_VBG this_DT trend_NN bad_JJ tonight_NN #ThugLife_HT
@ALAXASS_USR #idontevenknowyournamebro_HT

b) What is the POS tagging accuracy for the whole corpus?

1.Compare every two POS tagging tokens from the two txt file(expected.txt, POS_results.txt)

2.Get the number of the same tokens and the number of the different tokens

3.Caclulate the accuracy:



```
the number of the same: 95183.0
the number of the different: 1274.0
the accuracy: 0.9867920420498253
```

c) Include in your report the frequency of each POS tag in the corpus.

NN=9564
NNPS=13
NNP=2812
NNS=2499
MD=13365
POS=141
PDT=1
PRP$=1874
PRP=9389
RBR=75
RBS=24
DT=4748
JJR=209
JJS=232
HT=2524
FW=2
USR=6320
URL=1091
RT=2419
UH=3128

```
TO=1874
VBD=1760
SYM=5
VBP=5042
VBN=638
VBZ=1813
WDT=10
VBG=1855
WP=539
RP=403
RB=5022
IN=5678
CC=1360
JJ=3810
```

Work:

Ziyi Hu
Part 1: a, b, c
Part 2: a, c

Dongyang Li
Part 1: d, e, f
Part 2: b