

Homework 5

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Exercise 1 :

	rank	team_name
370	0.016361	Mary Hardin-Baylor
440	0.013252	NW Missouri St
5	0.012135	Alabama
133	0.010817	Clemson
668	0.009873	UW-Oshkosh
598	0.008532	St Francis IN
673	0.008413	UW-Whitewater
299	0.008065	James Madison
608	0.008055	St Thomas
435	0.007872	Mount Union
526	0.006945	Reinhardt
564	0.006858	Shepherd
465	0.006675	North Dakota St
457	0.006605	North Alabama
301	0.006604	John Carroll
247	0.006349	Grand Valley St
363	0.006288	Marian IN
463	0.006068	North Central
48	0.005991	Baker
94	0.005753	California PA
649	0.005724	Trinity CT
432	0.005697	Morningside
736	0.005683	Wheaton
261	0.005658	Harding
302	0.005546	Johns Hopkins

Figure 1 : Top_25 t=10

	rank	team_name
440	0.037473	NW Missouri St
5	0.033757	Alabama
133	0.033382	Clemson
370	0.030833	Mary Hardin-Baylor
668	0.016731	UW-Oshkosh
673	0.012089	UW-Whitewater
219	0.010567	Florida St
247	0.010181	Grand Valley St
301	0.010136	John Carroll
489	0.010059	Ohio State
210	0.009334	Ferris St
608	0.009277	St Thomas
704	0.008994	Washington
690	0.008892	Virginia Tech
435	0.008608	Mount Union
389	0.008296	Michigan
511	0.008173	Pittsburgh
492	0.008135	Oklahoma
202	0.007830	Emporia St
506	0.007659	Penn State
751	0.007375	Wisconsin
351	0.007037	Louisville
387	0.006985	Miami FL
458	0.006618	North Carolina
581	0.006524	Southern Cal

Figure 2 : Top_25 t=100

	rank	team_name
5	0.060762	Alabama
133	0.060452	Clemson
440	0.030245	NW Missouri St
219	0.018827	Florida St
489	0.017996	Ohio State
704	0.015900	Washington
690	0.015835	Virginia Tech
389	0.014838	Michigan
511	0.014662	Pittsburgh
492	0.014400	Oklahoma
506	0.013681	Penn State
751	0.013097	Wisconsin
351	0.012622	Louisville
387	0.012429	Miami FL
581	0.011598	Southern Cal
458	0.011426	North Carolina
494	0.011300	Oklahoma St
215	0.011259	Florida
628	0.010821	Tennessee
36	0.010820	Auburn
242	0.009985	Georgia Tech
321	0.009553	LSU
728	0.009527	Western Michigan
611	0.009518	Stanford
299	0.008687	James Madison

Figure 3 : Top_25 t=1000

	rank	team_name
5	0.067230	Alabama
133	0.066931	Clemson
219	0.020819	Florida St
489	0.019906	Ohio State
704	0.017565	Washington
690	0.017510	Virginia Tech
389	0.016413	Michigan
440	0.016329	NW Missouri St
511	0.016222	Pittsburgh
492	0.015910	Oklahoma
506	0.015132	Penn State
751	0.014478	Wisconsin
351	0.013966	Louisville
387	0.013742	Miami FL
581	0.012820	Southern Cal
458	0.012603	North Carolina
494	0.012478	Oklahoma St
215	0.012446	Florida
628	0.011964	Tennessee
36	0.011964	Auburn
242	0.011042	Georgia Tech
321	0.010533	LSU
728	0.010528	Western Michigan
611	0.010516	Stanford
633	0.009516	Texas A&M

Figure 4 : Top_25 t=10000

Plot $\|w_t - w_\infty\|_1$ as a function of t for t=1,...,10000.

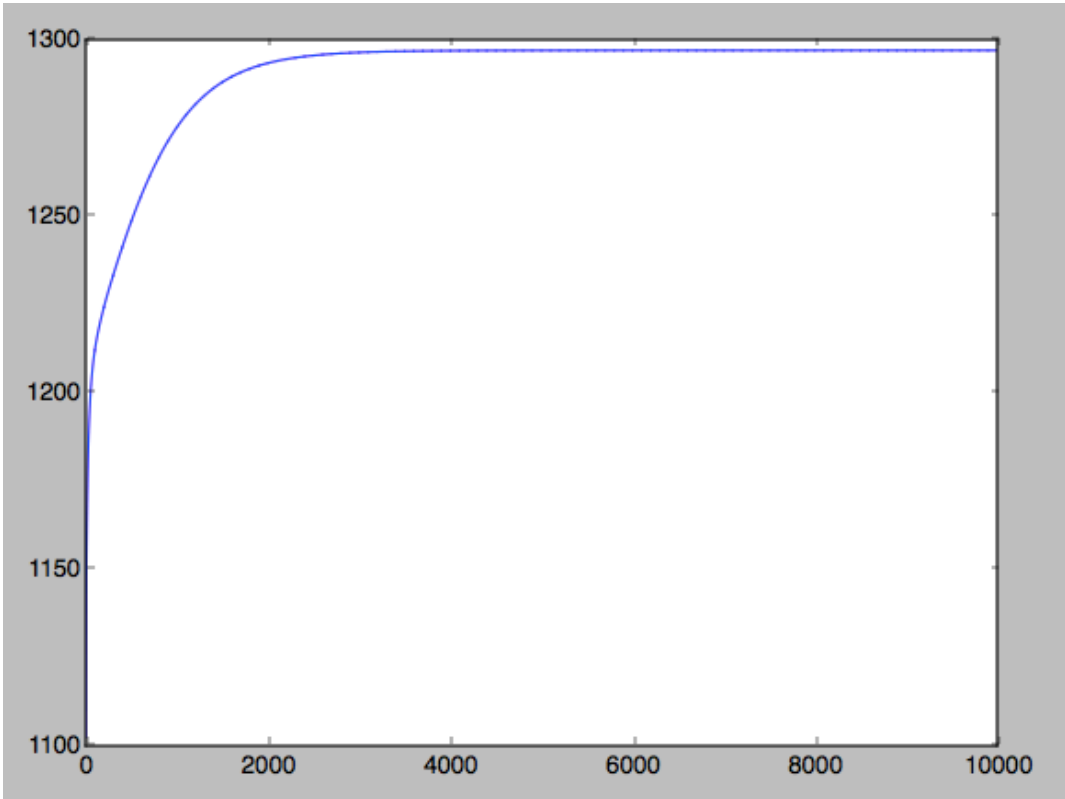


Figure 5: Plot $\|w_t - w_\infty\|_1$

Exercise 2 :

Plot the objective (divergence penalty) as a function of iteration.

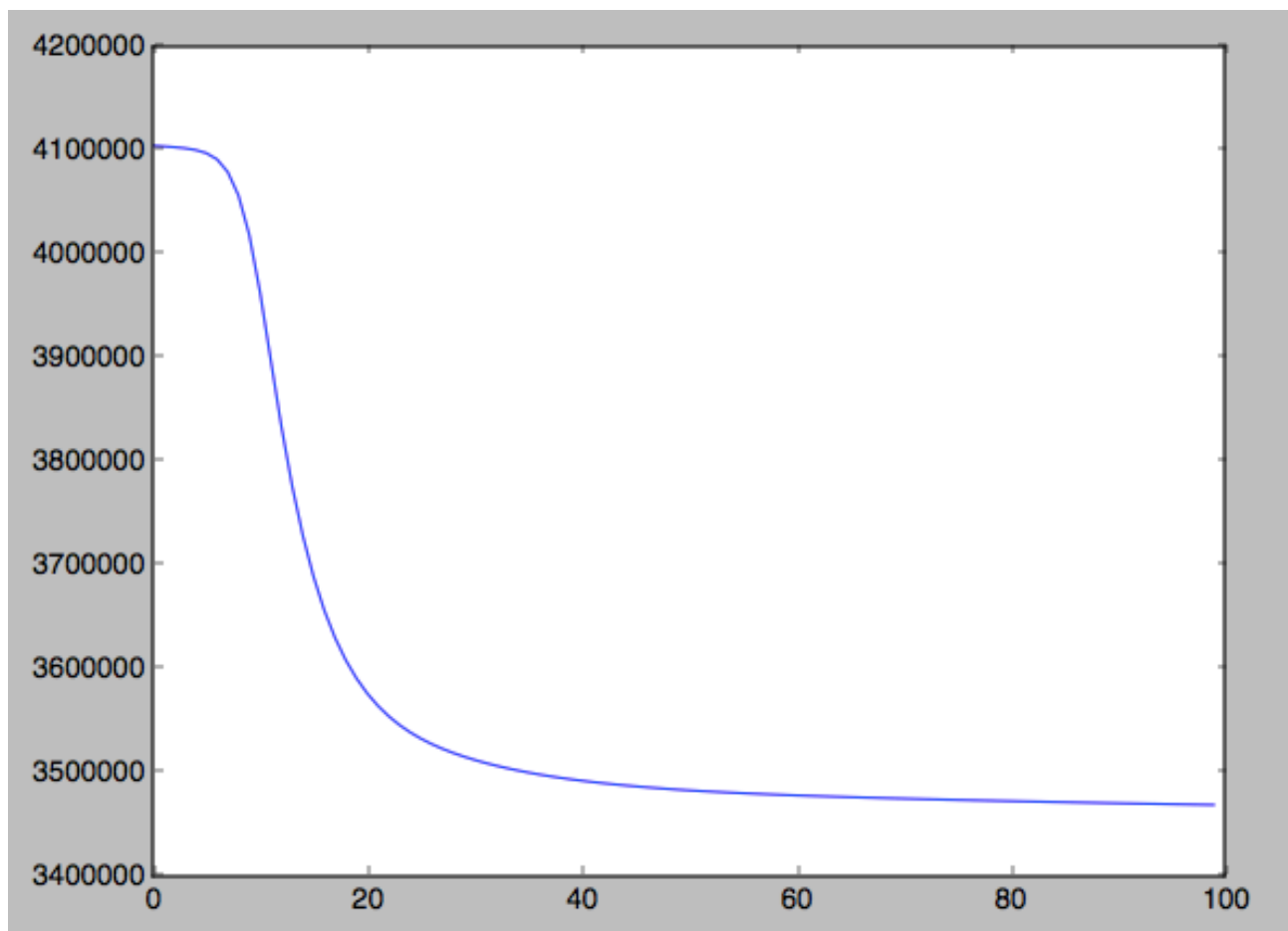


Figure 6 : Plot of the divergence penalty

I didn't print in a 5x5 table because we couldn't see well.

Here are the results for the 25 documents :

	0	1
0	([president], 0.0109644410825)	([food], 0.0178529026043)
1	([ask], 0.0107002208976)	([restaurant], 0.0103694544767)
2	([official], 0.0100228035149)	([serve], 0.00996833573138)
3	([interview], 0.0098780237195)	([taste], 0.00904219250484)
4	([meeting], 0.00969625688454)	([fresh], 0.00857502848627)
5	([tell], 0.00951733113929)	([eat], 0.00856756728322)
6	([comment], 0.00923270949411)	([dinner], 0.00777975885742)
7	([yesterday], 0.00870542410785)	([fish], 0.0076413214456)
8	([member], 0.00858174998025)	([cook], 0.00751857144501)
9	([news], 0.00820720969031)	([add], 0.00743520537889)

	2	3
0	([music], 0.0204838262563)	([state], 0.01472959966)
1	([play], 0.0171661154739)	([pay], 0.0146369390448)
2	([film], 0.0119786164024)	([money], 0.0135543371303)
3	([performance], 0.0116723879803)	([budget], 0.0119439664011)
4	([audience], 0.0103992922276)	([tax], 0.0108096842458)
5	([production], 0.00911993140805)	([bill], 0.01048434807)
6	([stage], 0.00897886296831)	([program], 0.0104226153499)
7	([theater], 0.00889179227898)	([cost], 0.00976856667399)
8	([dance], 0.00864127061964)	([plan], 0.00976500146644)
9	([song], 0.00854630523203)	([cut], 0.0093327626448)

	4	5
0	([percent], 0.0299264612132)	([hotel], 0.0150817124226)
1	([price], 0.019066728355)	([room], 0.0139432918676)
2	([market], 0.0181576582551)	([travel], 0.0130175494112)
3	([stock], 0.0148002579967)	([flight], 0.0103354049984)
4	([rate], 0.0134410056296)	([trip], 0.00998941838135)
5	([rise], 0.0127127416971)	([service], 0.0091688022995)
6	([fall], 0.0100085374648)	([site], 0.00829652279242)
7	([increase], 0.00949143720117)	([airline], 0.00797587684253)
8	([sale], 0.00923397458858)	([park], 0.00789967600852)
9	([share], 0.0092121362176)	([cost], 0.00780061655124)

	6	7
0	([city], 0.0215242850076)	([keep], 0.00843186986147)
1	([building], 0.0174678766691)	([problem], 0.00801630730136)
2	([build], 0.0144751979972)	([easy], 0.00672478863393)
3	([community], 0.0122720771838)	([water], 0.00595789837794)
4	([area], 0.0119979351377)	([thing], 0.00569914512249)
5	([project], 0.011566407831)	([sure], 0.00559657432206)
6	([resident], 0.0108135983866)	([small], 0.00534548895095)
7	([local], 0.0103255457665)	([put], 0.00533830696443)
8	([store], 0.0101653781662)	([plant], 0.00513335108541)
9	([space], 0.00953222982463)	([case], 0.00510448285986)

	8	9
0	([case], 0.0203821121207)	([editor], 0.0230710654946)
1	([lawyer], 0.0174085607208)	([war], 0.0109971630609)
2	([court], 0.017155079603)	([article], 0.0109436523334)
3	([charge], 0.0169263677523)	([american], 0.00974996469608)
4	([law], 0.0159836195696)	([country], 0.00827038022807)
5	([judge], 0.0117526578603)	([public], 0.00761820487716)
6	([legal], 0.00975144735078)	([americans], 0.00749516655277)
7	([investigation], 0.0088851502275)	([political], 0.00727269588975)
8	([trial], 0.00862963663341)	([believe], 0.00627376933473)
9	([file], 0.00826945110537)	([news], 0.00609586431668)

	10	11
0	([police], 0.0220885897664)	([father], 0.0504202020095)
1	([kill], 0.015574559202)	([mrs], 0.0443372763457)
2	([official], 0.0153196937895)	([son], 0.043511098948)
3	([fire], 0.0121042722953)	([daughter], 0.0332736810493)
4	([officer], 0.0111779637551)	([graduate], 0.0324791855138)
5	([car], 0.0101606400003)	([president], 0.0255963514138)
6	([report], 0.0100478271208)	([mother], 0.0250533680124)
7	([city], 0.00935161180992)	([retire], 0.0232855533066)
8	([attack], 0.0088958637146)	([marry], 0.0224211023179)
9	([area], 0.00709025663139)	([receive], 0.0197486194099)

	12	13
0	([game], 0.0323645671489)	([art], 0.0218690183798)
1	([play], 0.0186402076749)	([artist], 0.0141405429415)
2	([season], 0.0159941639296)	([collection], 0.0130837081454)
3	([player], 0.0155962752603)	([museum], 0.0110188603296)
4	([team], 0.0130118645437)	([photograph], 0.00993728871365)
5	([hit], 0.0128394714448)	([exhibition], 0.00975384749454)
6	([guy], 0.0120689073543)	([painting], 0.00806936741311)
7	([baseball], 0.0106972600029)	([design], 0.00768728667981)
8	([start], 0.0104351757384)	([open], 0.006968562993)
9	([fan], 0.0103346065055)	([gallery], 0.00685532527256)

	14	15
0	([man], 0.0140713692762)	([campaign], 0.0209582082951)
1	([tell], 0.0121853975207)	([political], 0.0192415038669)
2	([woman], 0.0119590673053)	([vote], 0.0180092142781)
3	([friend], 0.00921484949896)	([party], 0.0154871112822)
4	([ask], 0.00894375635325)	([election], 0.0153660471539)
5	([home], 0.00836605019819)	([republican], 0.0140140946552)
6	([wear], 0.00807274844477)	([candidate], 0.0132845927431)
7	([live], 0.00799425575393)	([leader], 0.012078692353)
8	([young], 0.00781008427238)	([democratic], 0.0118186908934)
9	([thing], 0.0077390324922)	([support], 0.0101728061627)

	16	17
0	([win], 0.0305473885503)	([write], 0.0202340650535)
1	([second], 0.0226465832769)	([book], 0.0194851018742)
2	([score], 0.0158746380421)	([life], 0.0149671747234)
3	([victory], 0.0156164282125)	([story], 0.00999547479677)
4	([play], 0.0142225443367)	([read], 0.00929112648763)
5	([point], 0.0140290490712)	([love], 0.00871742832584)
6	([final], 0.0125883193699)	([friend], 0.00742621871709)
7	([third], 0.0125461262476)	([man], 0.0071172208925)
8	([lose], 0.0112435386221)	([author], 0.00711354374098)
9	([game], 0.0111189696499)	([character], 0.00700372976095)

18

19

0	([world], 0.00934228780889)	([student], 0.014963373851)
1	([far], 0.00699725713499)	([school], 0.0149548566937)
2	([light], 0.00630050941133)	([study], 0.0141471134962)
3	([great], 0.00623746766636)	([percent], 0.00942310618052)
4	([century], 0.00615953532718)	([research], 0.00889871492619)
5	([mile], 0.00567729035361)	([professor], 0.00770031776028)
6	([stand], 0.00556347724943)	([number], 0.0075320637052)
7	([turn], 0.00502833846095)	([system], 0.00737328114185)
8	([change], 0.00491914896017)	([result], 0.00704099414164)
9	([past], 0.00483988694572)	([education], 0.00674111719301)

20

21

0	([child], 0.0215747765996)	([government], 0.0139400889372)
1	([drug], 0.0197287470632)	([american], 0.0123652642906)
2	([health], 0.0175312356144)	([leader], 0.0120684196145)
3	([woman], 0.0156788598142)	([states], 0.0120221129991)
4	([care], 0.0156056042963)	([military], 0.0116307375047)
5	([doctor], 0.0152114672868)	([country], 0.0109693115184)
6	([medical], 0.0134509922162)	([official], 0.00938338907699)
7	([patient], 0.012544932638)	([war], 0.00913342606292)
8	([treatment], 0.0113734281073)	([force], 0.008313231818)
9	([family], 0.0108042797441)	([peace], 0.00656267701572)

22

23

0	([team], 0.0348747107836)	([lucrative], 0.0226935047969)
1	([coach], 0.0242537451427)	([computer], 0.014517024754)
2	([player], 0.0179244205048)	([product], 0.0120101369298)
3	([season], 0.0177913491949)	([network], 0.0107050137689)
4	([contract], 0.015093742101)	([technology], 0.0106766200008)
5	([football], 0.0150543910437)	([industry], 0.00980673461552)
6	([play], 0.0139048287192)	([executive], 0.00892431335238)
7	([pass], 0.0115062452826)	([president], 0.0086972704953)
8	([college], 0.0109146483703)	([sell], 0.0086783431773)
9	([offensive], 0.010824989365)	([advertising], 0.00837981653727)

24

0	([lucrative], 0.0333827987028)
1	([states], 0.0153812412143)
2	([business], 0.0145108021862)
3	([bank], 0.0130187082605)
4	([financial], 0.012169996991)
5	([large], 0.0105269079479)
6	([deal], 0.0104513470931)
7	([trade], 0.0102981439277)
8	([operation], 0.0100099089892)
9	([investment], 0.00946322040343)