# HW5_ML

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## 1.

a)

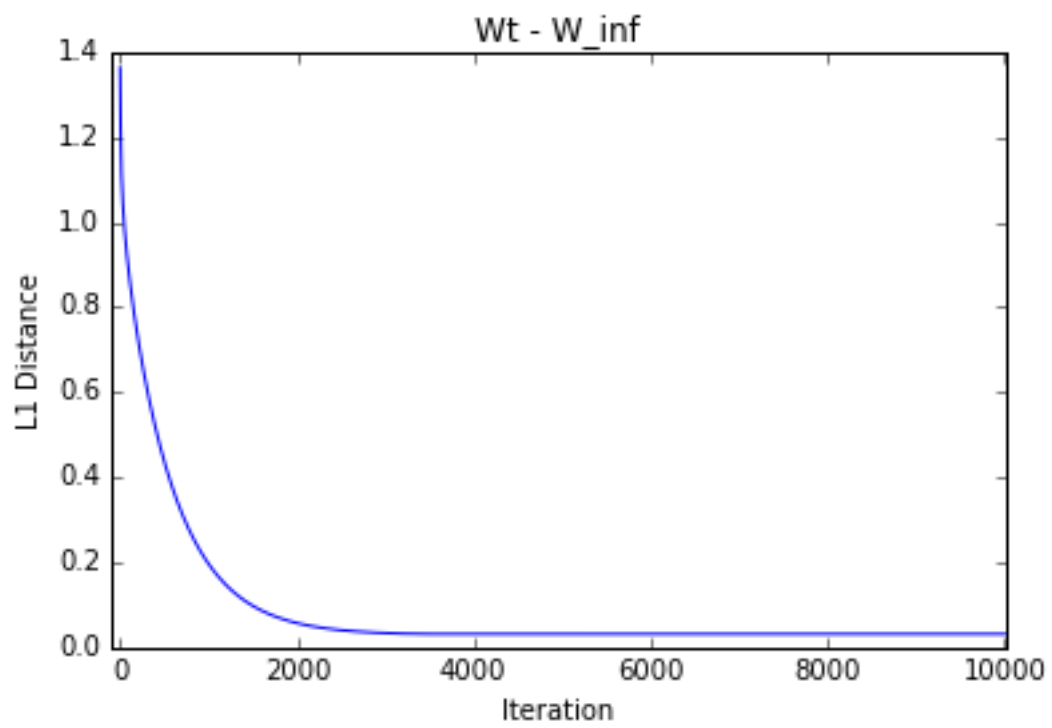| | t_10 | Team_10 | Value_10 | t_100 | Team_100 | Value_100 | t_1000 | Team_1000 | Value_1000 | t_10000 | Team_10000 | Value_10000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 10 | Alabama | 0.00682702637434 | 100 | Alabama | 0.0180351211501 | 1000 | Alabama | 0.0310462725199 | 10000 | Alabama | 0.0322079007809 |
| 1 | 10 | Clemson | 0.00606384677625 | 100 | Clemson | 0.0164651086817 | 1000 | Clemson | 0.0285405848186 | 10000 | Clemson | 0.029618118698 |
| 2 | 10 | UW-Oshkosh | 0.00582981143475 | 100 | NW Missouri St | 0.0102863533766 | 1000 | Florida St | 0.0150236693929 | 10000 | Florida St | 0.0155849589411 |
| 3 | 10 | Mary Hardin-Baylor | 0.0054623796808 | 100 | Florida St | 0.00877700930522 | 1000 | Ohio State | 0.01488214117 | 10000 | Ohio State | 0.0154383945946 |
| 4 | 10 | UW-Whitewater | 0.00501885987169 | 100 | Ohio State | 0.00866447482499 | 1000 | Michigan | 0.0127000119745 | 10000 | Pittsburgh | 0.0131761668276 |
| 5 | 10 | NW Missouri St | 0.00462696718687 | 100 | Michigan | 0.00740367409736 | 1000 | Pittsburgh | 0.0126997661604 | 10000 | Michigan | 0.0131740295978 |
| 6 | 10 | North Alabama | 0.00446012440709 | 100 | Pittsburgh | 0.00738478483404 | 1000 | Penn State | 0.0118036233913 | 10000 | Penn State | 0.0122443448945 |
| 7 | 10 | California PA | 0.00437882723419 | 100 | Washington | 0.00695249270189 | 1000 | Washington | 0.011696447671 | 10000 | Washington | 0.0121214267632 |
| 8 | 10 | Morningside | 0.00422979950108 | 100 | Penn State | 0.00688412513217 | 1000 | Southern Cal | 0.0114805631325 | 10000 | Wisconsin | 0.0119077763328 |
| 9 | 10 | Mount Union | 0.00421557169855 | 100 | Southern Cal | 0.00677272989433 | 1000 | Wisconsin | 0.0114804741806 | 10000 | Southern Cal | 0.0119021659049 |
| 10 | 10 | St Thomas | 0.00419000763734 | 100 | Wisconsin | 0.00671654753307 | 1000 | Auburn | 0.0113280673541 | 10000 | Auburn | 0.0117500957762 |
| 11 | 10 | John Carroll | 0.00404450552225 | 100 | UW-Oshkosh | 0.00665741101962 | 1000 | Oklahoma | 0.01126915648 | 10000 | Oklahoma | 0.0116844307122 |
| 12 | 10 | Florida St | 0.00396878022922 | 100 | Oklahoma | 0.00663320742573 | 1000 | Florida | 0.011183082422 | 10000 | Florida | 0.0116005207594 |
| 13 | 10 | St Francis IN | 0.00396825173061 | 100 | Auburn | 0.00660762025841 | 1000 | LSU | 0.0111201075062 | 10000 | LSU | 0.0115296390341 |
| 14 | 10 | Ohio State | 0.00382713364908 | 100 | LSU | 0.00655987492859 | 1000 | Virginia Tech | 0.0107519559264 | 10000 | Virginia Tech | 0.0111531139105 |
| 15 | 10 | Alfred | 0.00373840725064 | 100 | Florida | 0.00651936392556 | 1000 | North Carolina | 0.0103706096064 | 10000 | Louisville | 0.0107587759106 |
| 16 | 10 | North Dakota St | 0.00357682963604 | 100 | Virginia Tech | 0.00629132363368 | 1000 | Louisville | 0.0103693296124 | 10000 | North Carolina | 0.0107510318141 |
| 17 | 10 | Shepherd | 0.00347436945964 | 100 | North Carolina | 0.00617930349799 | 1000 | Tennessee | 0.0099616290553 | 10000 | Tennessee | 0.0103325081098 |
| 18 | 10 | Wheaton | 0.00329772309463 | 100 | Louisville | 0.00602531996127 | 1000 | Mississippi | 0.00960438612854 | 10000 | Mississippi | 0.00995938563739 |
| 19 | 10 | St Lawrence | 0.0032957541704 | 100 | Mary Hardin-Baylor | 0.00585279881938 | 1000 | Stanford | 0.00959441071258 | 10000 | Stanford | 0.00994695446721 |
| 20 | 10 | Michigan | 0.00328726811224 | 100 | Tennessee | 0.00582289182975 | 1000 | Miami FL | 0.00955750084551 | 10000 | Miami FL | 0.00991362975281 |
| 21 | 10 | Wesley | 0.00325938573453 | 100 | Stanford | 0.00566503234228 | 1000 | Oklahoma St | 0.00921006060975 | 10000 | Oklahoma St | 0.00954630749393 |
| 22 | 10 | Marian IN | 0.00324278737761 | 100 | Mississippi | 0.00566068949468 | 1000 | Georgia Tech | 0.00913811786688 | 10000 | Georgia Tech | 0.00947880303303 |
| 23 | 10 | Trinity CT | 0.0032362974653 | 100 | Miami FL | 0.00559057429872 | 1000 | Colorado | 0.00911941860244 | 10000 | Colorado | 0.00944992322807 |
| 24 | 10 | Indiana PA | 0.0032302062344 | 100 | Oklahoma St | 0.00546000295258 | 1000 | Texas A&M | 0.00891018289419 | 10000 | Texas A&M | 0.00924163877768 |

Figure 1:

b)

## 2.

a)

b)

Figure 2:
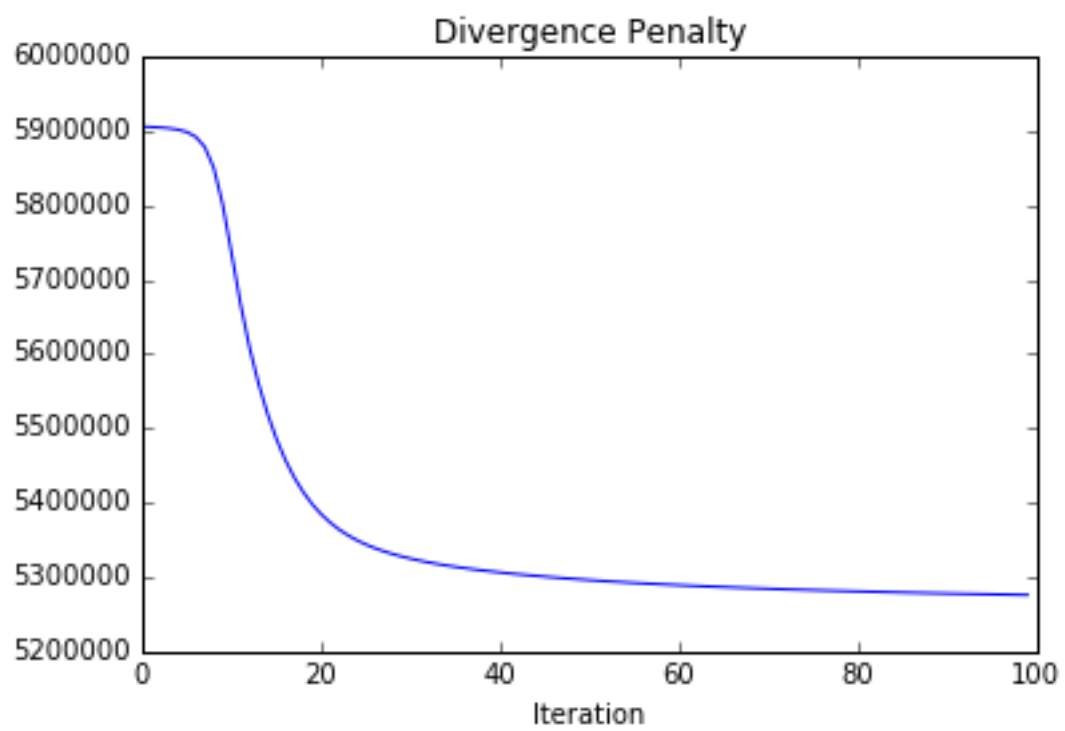


Figure 3:

| word_0 | weight_0 | word_1 | weight_1 | word_2 | weight_2 | word_3 | weight_3 | word_4 | weight_4 |
|---|---|---|---|---|---|---|---|---|---|
| hour | 0.014735515 | member | 0.019882097 | tell | 0.017712553 | economic | 0.011615568 | music | 0.020513364 |
| travel | 0.013838082 | meeting | 0.018037836 | ask | 0.013712558 | country | 0.011179591 | play | 0.018120985 |
| trip | 0.012325296 | official | 0.012268206 | hand | 0.011780432 | states | 0.01043618 | film | 0.013499052 |
| hotel | 0.010225982 | leader | 0.011863893 | happen | 0.011258201 | economy | 0.009887993 | performance | 0.011812081 |
| visit | 0.009560263 | issue | 0.011750885 | feel | 0.010889216 | industry | 0.009808706 | movie | 0.010949166 |
| fly | 0.009494016 | group | 0.011465301 | wait | 0.009161023 | percent | 0.009205732 | audience | 0.009910335 |
| train | 0.009458676 | speak | 0.010729561 | bad | 0.008959492 | increase | 0.008856992 | production | 0.009093967 |
| ticket | 0.008137935 | conference | 0.008902293 | night | 0.008695229 | plant | 0.008080254 | theater | 0.008905514 |
| mile | 0.007790172 | ask | 0.007889234 | room | 0.008418039 | nation | 0.007994563 | dance | 0.008655592 |
| tour | 0.007273349 | public | 0.007839116 | trouble | 0.00792747 | government | 0.007969085 | song | 0.008558556 |

| word_5 | weight_5 | word_6 | weight_6 | word_7 | weight_7 | word_8 | weight_8 | word_9 | weight_9 |
|---|---|---|---|---|---|---|---|---|---|
| percent | 0.029228709 | game | 0.028026886 | war | 0.021759689 | drug | 0.015233625 | thing | 0.026032992 |
| market | 0.023863738 | team | 0.023424259 | military | 0.016192712 | health | 0.014075011 | lot | 0.018392715 |
| price | 0.019633081 | play | 0.021375097 | country | 0.014507255 | study | 0.011628702 | really | 0.015844598 |
| stock | 0.018442112 | player | 0.01973373 | american | 0.014271376 | cause | 0.010633431 | feel | 0.01365967 |
| share | 0.016975008 | season | 0.019173205 | force | 0.013754911 | doctor | 0.010173541 | hard | 0.012396133 |
| sale | 0.016448706 | win | 0.018381135 | government | 0.013479023 | medical | 0.009750711 | great | 0.012145116 |
| company | 0.015844721 | second | 0.015538443 | states | 0.011313365 | patient | 0.009466608 | big | 0.012075733 |
| analyst | 0.01306267 | victory | 0.011909984 | troop | 0.008713258 | treatment | 0.009176285 | little | 0.012008287 |
| sell | 0.012390932 | coach | 0.010908662 | leader | 0.008470928 | risk | 0.008603871 | guy | 0.010613236 |
| rise | 0.011873971 | score | 0.010632023 | attack | 0.00838453 | problem | 0.008044764 | kind | 0.009663984 |

| word_10 | weight_10 | word_11 | weight_11 | word_12 | weight_12 | word_13 | weight_13 | word_14 | weight_14 |
|---|---|---|---|---|---|---|---|---|---|
| case | 0.022957649 | city | 0.037911351 | computer | 0.014525389 | family | 0.029671272 | wear | 0.012700481 |
| court | 0.022824205 | local | 0.01816226 | system | 0.014430692 | woman | 0.028165303 | foot | 0.010014893 |
| lawyer | 0.020746349 | community | 0.017063047 | information | 0.010444036 | father | 0.027825096 | stand | 0.008732876 |
| law | 0.019179581 | resident | 0.016510828 | technology | 0.009930294 | child | 0.025365418 | front | 0.008483371 |
| judge | 0.016189462 | area | 0.012343288 | program | 0.007627726 | mother | 0.023296515 | car | 0.008140288 |
| charge | 0.015001716 | neighborhood | 0.012303749 | available | 0.007402594 | son | 0.023203142 | line | 0.007087325 |
| legal | 0.013061073 | building | 0.011761604 | design | 0.007078007 | mrs | 0.021848405 | head | 0.00661823 |
| trial | 0.010931657 | state | 0.010148639 | require | 0.006425 | wife | 0.019322143 | turn | 0.006545151 |
| state | 0.010641466 | live | 0.009772326 | company | 0.006074477 | daughter | 0.018067638 | drive | 0.006391822 |
| file | 0.009467877 | street | 0.009662986 | number | 0.005987019 | friend | 0.016489794 | place | 0.006331142 |

| word_15 | weight_15 | word_16 | weight_16 | word_17 | weight_17 | word_18 | weight_18 | word_19 | weight_19 |
|---|---|---|---|---|---|---|---|---|---|
| official | 0.031118926 | book | 0.016460759 | clear | 0.008567664 | executive | 0.028301101 | food | 0.013758795 |
| police | 0.028678392 | art | 0.013760771 | deal | 0.007749334 | president | 0.025850636 | serve | 0.009346441 |
| report | 0.018910771 | life | 0.010131983 | question | 0.00740625 | chief | 0.015440005 | restaurant | 0.008587711 |
| officer | 0.017226202 | write | 0.009915926 | agree | 0.007376308 | company | 0.015134656 | eat | 0.007990571 |
| yesterday | 0.011650688 | history | 0.008773815 | plan | 0.007073492 | television | 0.014360151 | fresh | 0.00790715 |
| man | 0.011483438 | artist | 0.008731784 | move | 0.007046941 | name | 0.013907483 | taste | 0.007447193 |
| spokesman | 0.011329219 | world | 0.00816915 | agreement | 0.006789534 | director | 0.012236376 | dinner | 0.007111043 |
| arrest | 0.010894627 | museum | 0.007590532 | decision | 0.00653706 | vice | 0.011958871 | add | 0.006941834 |
| charge | 0.00970655 | story | 0.007185308 | side | 0.006534857 | business | 0.011722699 | red | 0.006924274 |
| kill | 0.009356662 | novel | 0.006931462 | negotiation | 0.006370506 | network | 0.011090674 | water | 0.006633825 |

| word_20 | weight_20 | word_21 | weight_21 | word_22 | weight_22 | word_23 | weight_23 | word_24 | weight_24 |
|---|---|---|---|---|---|---|---|---|---|
| bill | 0.018178137 | political | 0.022792383 | pay | 0.023165378 | school | 0.029716475 | house | 0.014038545 |
| budget | 0.016339942 | campaign | 0.019246543 | company | 0.021214892 | student | 0.027679328 | store | 0.013638291 |
| tax | 0.014100643 | vote | 0.018043531 | money | 0.018856385 | editor | 0.023379845 | building | 0.012103863 |
| cut | 0.013506708 | election | 0.016570422 | business | 0.015519935 | article | 0.013547541 | sell | 0.012047121 |
| state | 0.013407562 | party | 0.01636647 | financial | 0.014145131 | class | 0.012765049 | design | 0.011929853 |
| increase | 0.012269042 | republican | 0.014143678 | bank | 0.012537811 | college | 0.012176533 | open | 0.010247705 |
| program | 0.012210216 | candidate | 0.013926198 | investment | 0.010320116 | child | 0.010584315 | space | 0.009688094 |
| proposal | 0.011699256 | democratic | 0.012743296 | firm | 0.009911577 | education | 0.010133593 | room | 0.008196433 |
| propose | 0.01152334 | state | 0.010960072 | cost | 0.009911222 | teacher | 0.008773548 | home | 0.008110263 |
| plan | 0.011454251 | voter | 0.010053964 | buy | 0.009774377 | write | 0.008323863 | buy | 0.008075775 |

Figure 4: