

HOME WORK - 5

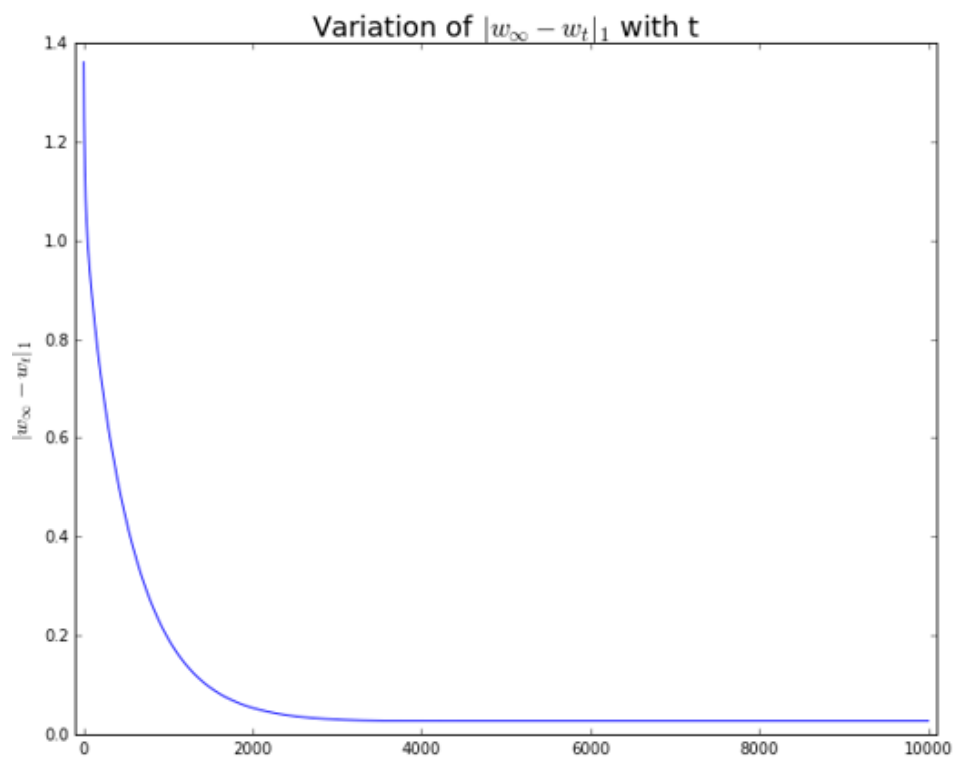
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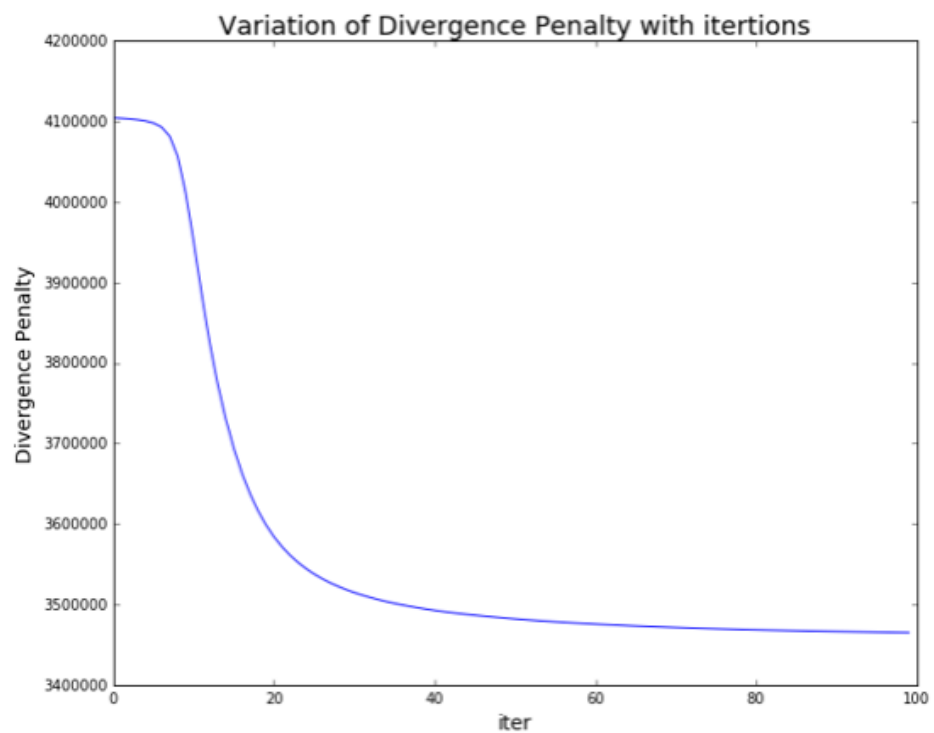
Solution – 1 (a) Markov Chains – Ranking teams

	t=10	weight	t=100	weight	t=1000	weight	t=10000	weight
1	Mary Hardin-Baylor	0.014752	NW Missouri St	0.038258	Alabama	0.060719	Alabama	0.067282
2	NW Missouri St	0.013151	Alabama	0.033364	Clemson	0.060408	Clemson	0.066983
3	Alabama	0.012412	Clemson	0.032988	NW Missouri St	0.030495	Florida St	0.020835
4	Clemson	0.011029	Mary Hardin-Baylor	0.030883	Florida St	0.018814	Ohio State	0.019922
5	UW-Oshkosh	0.009925	UW-Oshkosh	0.016844	Ohio State	0.017983	Washington	0.017579
6	St Thomas	0.008178	UW-Whitewater	0.012160	Washington	0.015889	Virginia Tech	0.017524
7	UW-Whitewater	0.008168	Florida St	0.010444	Virginia Tech	0.015824	Michigan	0.016426
8	St Francis IN	0.008098	Grand Valley St	0.010261	Michigan	0.014827	NW Missouri St	0.016342
9	Mount Union	0.007755	John Carroll	0.010246	Pittsburgh	0.014651	Pittsburgh	0.016235
10	James Madison	0.007428	Ohio State	0.009941	Oklahoma	0.014390	Oklahoma	0.015922
11	Reinhardt	0.006954	Ferris St	0.009426	Penn State	0.013672	Penn State	0.015144
12	John Carroll	0.006911	St Thomas	0.009332	Wisconsin	0.013088	Wisconsin	0.014489
13	Shepherd	0.006839	Washington	0.008891	Louisville	0.012613	Louisville	0.013977
14	California PA	0.006722	Virginia Tech	0.008789	Miami FL	0.012420	Miami FL	0.013753
15	North Dakota St	0.006549	Mount Union	0.008713	Southern Cal	0.011589	Southern Cal	0.012830
16	Baker	0.006369	Michigan	0.008199	North Carolina	0.011419	North Carolina	0.012612
17	Alfred	0.006291	Pittsburgh	0.008077	Oklahoma St	0.011292	Oklahoma St	0.012488
18	Grand Valley St	0.006196	Oklahoma	0.008041	Florida	0.011251	Florida	0.012456
19	North Alabama	0.006136	Emporia St	0.008007	Tennessee	0.010813	Tennessee	0.011973
20	Harding	0.005764	Penn State	0.007569	Auburn	0.010812	Auburn	0.011973
21	Marian IN	0.005566	Wisconsin	0.007290	Georgia Tech	0.009978	Georgia Tech	0.011050
22	North Central	0.005537	Louisville	0.006954	LSU	0.009547	LSU	0.010542
23	Trinity CT	0.005464	Miami FL	0.006904	Western Michigan	0.009521	Western Michigan	0.010537
24	Wheaton	0.005457	North Carolina	0.006544	Stanford	0.009511	Stanford	0.010524
25	Morningside	0.005442	Southern Cal	0.006449	James Madison	0.008683	Texas A&M	0.009524

Solution – 1(b)



Solution – 2 (a) Non-negative Matrix Factorization



Solution 2 (b) (5 X 5 Topics table and weights of each word in topic)

Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights
percent	0.0377	states	0.03554	thing	0.0181	program	0.02453	contract	0.02386
rate	0.02246	country	0.03338	ask	0.01203	money	0.02037	pay	0.02045
increase	0.01825	american	0.02493	feel	0.01079	care	0.01778	deal	0.01859
rise	0.01468	world	0.02008	really	0.01033	health	0.0154	agreement	0.01594
low	0.01461	economic	0.01794	tell	0.0092	pay	0.01467	union	0.01591
tax	0.01233	government	0.01757	lot	0.00872	provide	0.01439	sign	0.01497
price	0.01231	foreign	0.0138	put	0.00829	service	0.01369	yesterday	0.01399
average	0.01217	nation	0.01321	question	0.00823	benefit	0.01192	worker	0.01211
cost	0.01099	international	0.0119	happen	0.00796	state	0.01179	plan	0.0115
cut	0.01076	trade	0.01051	little	0.00784	cost	0.01097	agree	0.01116

Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights
book	0.0146	military	0.01581	game	0.02231	law	0.03053	war	0.00992
art	0.01374	war	0.01246	team	0.01859	rule	0.01472	country	0.00932
artist	0.00856	government	0.01143	play	0.01836	state	0.01426	plane	0.00854
write	0.00831	official	0.01143	win	0.01512	issue	0.01267	history	0.00719
collection	0.00748	american	0.01022	season	0.01486	allow	0.0107	religious	0.007
image	0.00655	leader	0.00977	player	0.01466	decision	0.00993	world	0.00682
museum	0.00634	force	0.00952	second	0.0129	public	0.00959	american	0.00666
history	0.00612	peace	0.00837	victory	0.00918	legal	0.00826	german	0.00662
design	0.006	states	0.008	score	0.00837	case	0.00824	century	0.00632
exhibition	0.00593	troop	0.0071	point	0.008	require	0.00776	fly	0.00601

Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights
city	0.02616	water	0.00781	school	0.04565	woman	0.04451	editor	0.02225
building	0.02137	foot	0.00703	student	0.03356	man	0.02999	study	0.01348
area	0.01256	mile	0.00671	child	0.0225	life	0.0218	article	0.01278
build	0.01225	place	0.00666	class	0.01663	child	0.01892	drug	0.01144
site	0.01097	room	0.00637	college	0.01517	young	0.01783	research	0.01089
resident	0.01091	stand	0.00623	family	0.01464	family	0.01403	doctor	0.01044
open	0.00936	wall	0.00608	teacher	0.01213	wife	0.0138	cause	0.01021
street	0.00911	walk	0.00589	kid	0.01198	mother	0.01202	patient	0.00942
house	0.00865	wear	0.00579	parent	0.01189	friend	0.01202	report	0.00882
space	0.00864	house	0.00555	attend	0.01178	love	0.01098	treatment	0.00872

Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights
lawyer	0.02487	company	0.0281	company	0.02541	police	0.03194	require	0.01219
case	0.02215	market	0.02125	computer	0.01539	kill	0.02285	system	0.01065
charge	0.0192	stock	0.01914	sell	0.01233	officer	0.01643	propose	0.01059
court	0.01767	share	0.0183	product	0.01155	man	0.01489	problem	0.01043
judge	0.01545	sell	0.01556	industry	0.01071	official	0.01373	official	0.00981
trial	0.01216	percent	0.01526	customer	0.01007	arrest	0.0124	plan	0.00963
investigation	0.01168	buy	0.0125	technology	0.00991	fire	0.01208	proposal	0.00867
file	0.01081	price	0.01231	store	0.00971	crime	0.00961	agency	0.00778
prosecutor	0.00926	bank	0.01211	network	0.00943	shoot	0.00934	test	0.00777
accuse	0.00789	financial	0.01205	business	0.0087	yesterday	0.00934	program	0.00731

Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights	Topic	Weights
father	0.0616	music	0.01891	vote	0.01887	president	0.04359	food	0.01618
mrs	0.06152	play	0.01721	political	0.01855	executive	0.03901	serve	0.00949
son	0.05886	film	0.01254	campaign	0.01781	chief	0.02465	restaurant	0.0094
graduate	0.0516	performance	0.01165	republican	0.01404	director	0.02212	dinner	0.00859
daughter	0.03633	audience	0.01081	election	0.01344	name	0.01766	pound	0.00854
degree	0.03291	movie	0.00842	party	0.01331	vice	0.0164	taste	0.00823
mother	0.02885	stage	0.00835	candidate	0.01313	chairman	0.01583	eat	0.00785
receive	0.02765	theater	0.00821	leader	0.012	staff	0.01148	fresh	0.0077
marry	0.0263	production	0.00819	democratic	0.01103	member	0.01118	add	0.00742
ceremony	0.02156	dance	0.00798	state	0.01035	board	0.01092	red	0.00692