

APPENDIX: Various Clusterings of Shakespeare Concepts

The output matrix of ten iterations of the Leximancer program of Andrew Smith on the Shakespeare data is averaged and used as input into the clustering program of John Brzustowski.

If you would like to try other clustering methods than those presented here then please contact the author of this article for a copy of the data.

See <http://www.biology.ualberta.ca/jbrzusto/>

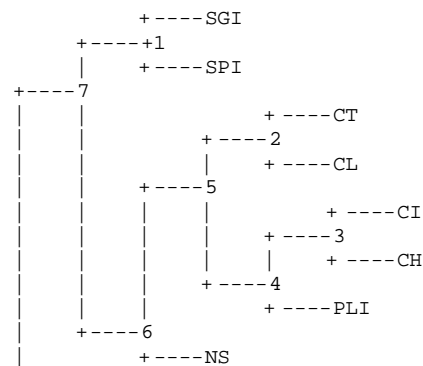
All programs were written by John Brzustowski, mostly while working as a programmer for the Department of Biological Sciences, University of Alberta, with additional funding from professors Jens Roland and Curtis Strobeck. You are free to: duplicate and/or link to these web pages; use the programs; redistribute the programs and documentation without fee, for non-commercial purposes; modify the programs, and redistribute the modifications, except for some portions I've obtained from sources that impose slightly stronger restrictions, documented in the source code. I try to fix errors as they are found, but none of the software comes with a warranty of any kind.

Example:

The Tree as Text Picture option draws a tree representing the clustering process. The samples form "leaf" nodes which occur at the right of the picture. Each step in the clustering process is represented by an "interior" node, which has descendants to its right. The calculator also shows a table listing the distances between adjacent nodes.

For example, the sample data yields the following tree:

Tree Topology: (branch lengths ignored)



INTRATEXTUALITY -- Kent Palmer

8
+-----SI

From	To	Length
1'	SIG	0.1
1'	SPI	0.1
7'	1'	0.153333
2'	CT	0.12
2'	CL	0.12
5'	2'	0.00833333
3'	CI	0.005
3'	CH	0.005
4'	3'	0.055
4'	PLI	0.06
5'	4'	0.0683333
6'	5'	0.0406667
6'	NS	0.169
7'	6'	0.0843333
8'	7'	0.0979167
8'	SI	0.35125

The structure of the tree represents the clustering process: the two descendents of an interior node are the two clusters joined at that point in the process. For example, clusters 2 and 4 were combined to create cluster 5. Although no attempt is made to represent distances in the drawing of the tree, a table is printed listing the actual distances between adjacent nodes. These distances have the property that for any pair of leaf nodes (ie. samples), the distance you get by tracing along the tree from one node to the other, adding appropriate values from the table as you go, is equal to the distance at which the two nodes joined the same cluster. For example, samples NS and CI are connect ed by the following path:

From	To	Distance
NS	6'	0.169
6'	5'	0.0406667
5'	4'	0.0683333
4'	3'	0.055
3'	CI	0.005

Total Distance: 0.338

The "tree length" between NS and CI is thus 0.338, and this is the same as the distance at which clusters 5 and NS were joined in step 6, as can be seen in the Clustering Progress table.

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Cluster V0.1

Using Complete Linkage

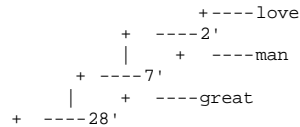
Complete Linkage means the largest distance between a sample in cluster A and a sample in cluster B

There are 70 samples.

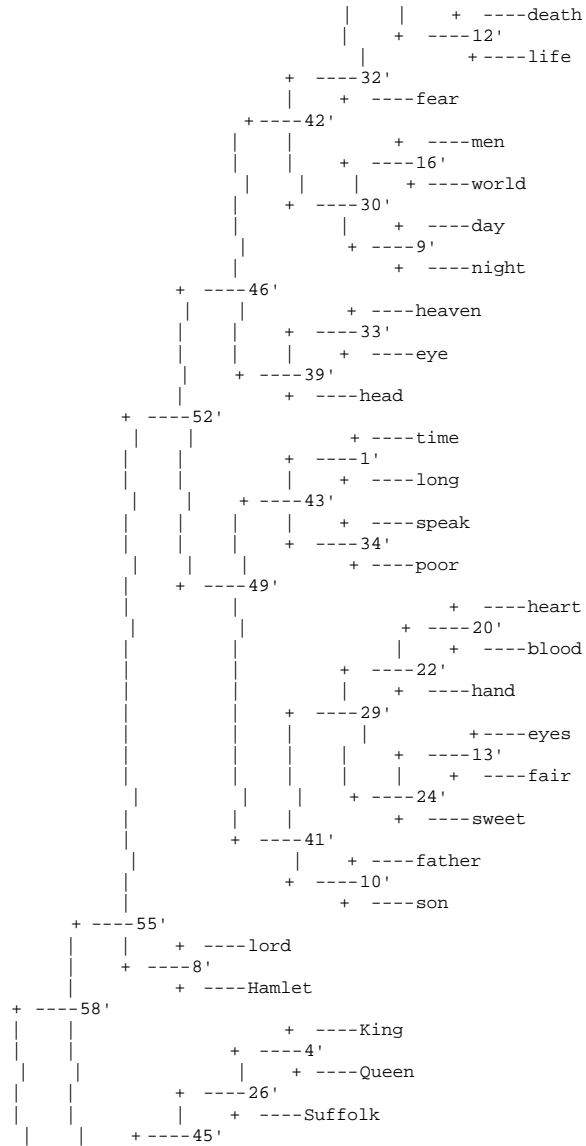
Clustering procedure: Square Similarity Matrix

Step	A	B	Distance
=====			
1	long time	-4424.828398	
2	man love	-1747.462519	
3	Antony Caesar	-1694.754824	
4	Queen King	-1678.089283	
5	Falstaff Prince	-1472.570564	
6	Iago Othello	-1210.368873	
7	great 2'	-1014.109708	
8	Hamlet lord	-1002.795987	
9	night day	-993.3825761	
10	son father	-951.7392791	
11	England France	-891.1990228	
12	life death	-845.8591067	
13	fair eyes	-760.7653294	
14	Warwick York	-743.0411375	
15	King_henry Gloucester	-715.6927455	
16	world men	-711.9417235	
17	Messenger Enter	-709.2634399	
18	Cleopatra 3'	-643.8657718	
19	15' God	-643.6775201	
20	blood heart	-632.7184313	
21	Lear Kent	-601.274394	
22	hand 20'	-538.5337281	
23	Bolingbroke King_richard	-526.6331677	
24	sweet 13'	-519.9122339	
25	Richard 14'	-518.4338971	
26	Suffolk 4'	-508.4643723	
27	Hector Troilus	-442.8305423	
28	12' 7'	-410.6189862	
29	24' 22'	-407.4871671	
30	9' 16'	-371.3071391	
31	Henry Edward	-357.3384168	
32	fear 28'	-337.5047132	
33	eye heaven	-329.1010541	
34	poor speak	-313.0032171	
35	French English	-311.4151642	
36	11' 19'	-299.5019457	
37	Brutus Exeunt	-269.6776721	
38	Exit Duke	-266.7145894	
39	33' head	-259.3235519	
40	31' 25'	-225.6107485	
41	29' 10'	-217.9035153	
42	32' 30'	-184.6388946	
43	34' 1'	-178.3640134	
44	Rome 37'	-173.9165526	
45	26' 36'	-167.8426651	
46	39' 42'	-134.6059935	
47	Servant Timon	-111.3884628	
48	Clown 38'	-105.6490894	
49	43' 41'	-105.4782264	
50	18' 17'	-98.38767608	
51	45' Buckingham	-98.28566856	
52	46' 49'	-90.48606063	
53	Speak 44'	-88.39099543	
54	Prospero Antonio	-75.61455801	
55	8' 52'	-41.02612886	
56	48' 35'	-11.00624837	
57	23' 40'	-10.88065655	
58	51' 55'	1.0	
59	5' 58'	1.0	
60	57' 59'	1.0	
61	50' 60'	1.0	
62	53' 61'	1.0	
63	6' 62'	1.0	
64	21' 63'	1.0	
65	27' 64'	1.0	
66	56' 65'	1.0	
67	Macbeth 66'	1.0	
68	47' 67'	1.0	
69	54' 68'	1.0	

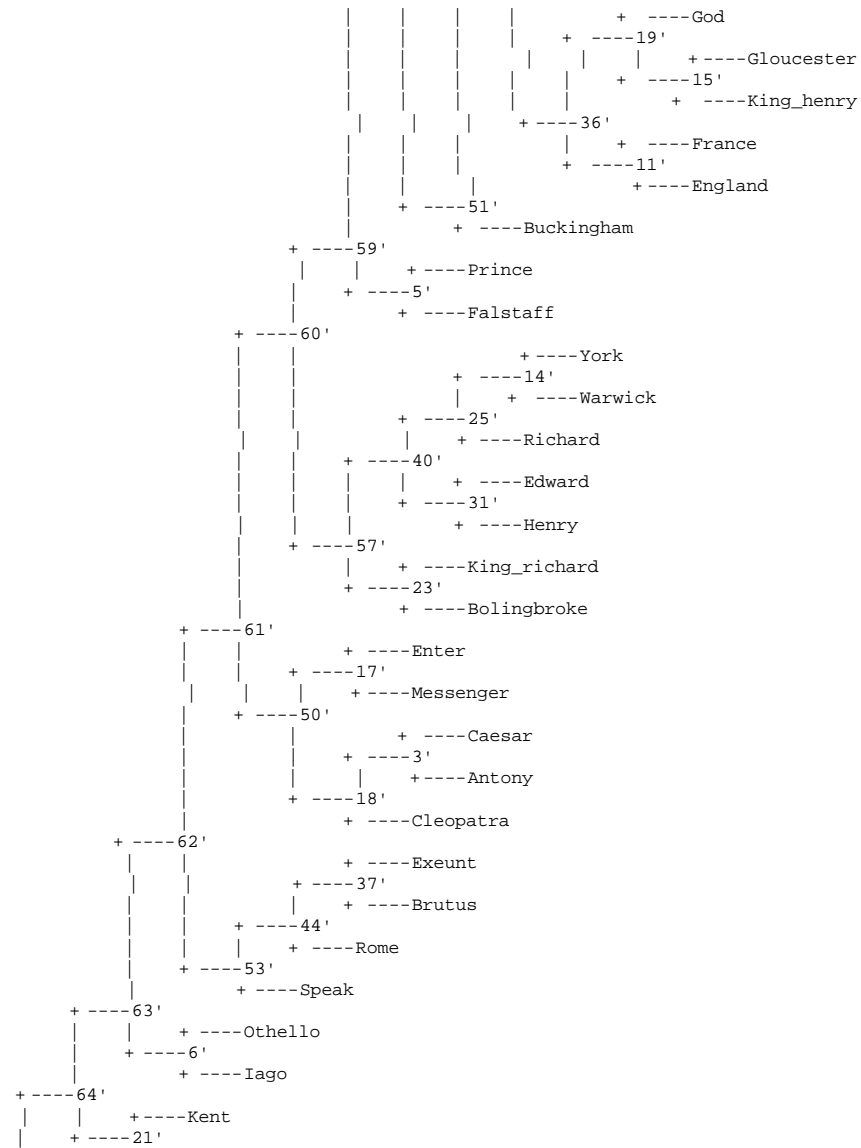
Tree Topology (edge lengths ignored)



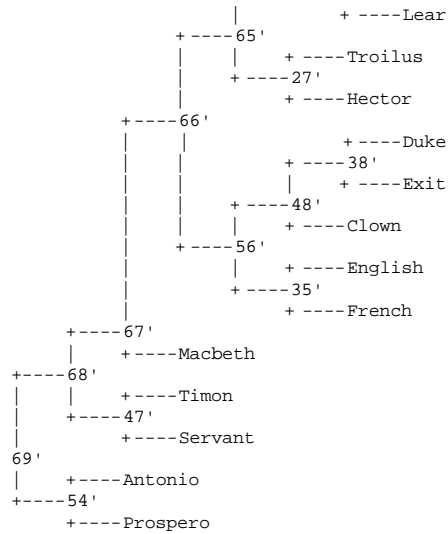
INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



From	To	Length		
69'	68'	0.0	28' 12'	217.62006025
68'	67'	0.0	12'	death -422.92955335
67'	66'	0.0	12'	life -422.92955335
66'	65'	0.0	32'	fear -168.7523566
65'	64'	0.0	42'	30' 93.33412225
64'	63'	0.0	30'	16' 170.3172922
63'	62'	0.0	16'	men -355.97086175
62'	61'	0.0	16'	world -355.97086175
61'	60'	0.0	30'	9' 311.03771850000004
60'	59'	0.0	9'	day -496.69128805
59'	58'	0.0	9'	night -496.69128805
58'	55'	21.01306443	46'	39' 62.35877919999999
55'	52'	24.729965885	39'	33' 34.88875110000001
52'	46'	22.059966435000007	33'	heaven -164.55052705
46'	42'	25.016450549999988	33'	eye -164.55052705
42'	32'	76.43290930000002	39'	head -129.66177595
32'	28'	36.557136499999984	52'	49' 7.496082885
28'	7'	301.7453609	49'	43' 36.442893500000004
7'	2'	366.6764055	43'	1' 2123.2321923
2'	love	-873.7312595	1'	time -2212.414199
2'	man	-873.7312595	1'	long -2212.414199
7'	great	-507.054854	43'	34' 67.31960184999998
			34'	speak -156.50160855
			34'	poor -156.50160855
			49'	41' 56.212644450000006
			41'	29' 94.7918259
			29'	22' 65.52328049999997
			22'	20' 47.09235160000003
			20'	heart -316.35921565
			20'	blood -316.35921565
			22'	hand -269.26686405
			29'	24' 56.21253340000001
			24'	13' 120.42654775
			13'	eyes -380.3826647
			13'	fair -380.3826647
			24'	sweet -259.95611695
			41'	10' 366.9178819
			10'	father -475.86963955
			10'	son -475.86963955
			55'	8' 480.88492907
			8'	lord -501.3979935
			8'	Hamlet -501.3979935
			58'	51' 49.64283428
			51'	45' 34.77849827
			45'	26' 170.31085359999997
			26'	4' 584.81245535
			4'	King -839.0446415
			4'	Queen -839.0446415

INTRATEXTUALITY -- Kent Palmer

26' Suffolk -254.23218615	31' Henry -178.6692084	64' 21' 301.137197
45' 36' 65.82964030000001	57' 23' 257.87625557499996	21' Kent -300.637197
36' 19' 172.0877872	23' King_richard -263.31658385	21' Lear -300.637197
19' God -321.83876005	23' Bolingbroke -263.31658385	65' 27' 221.91527115
19' 15' 36.00761269999998	61' 50' 49.69383804	27' Troilus -221.41527115
15' Gloucester -357.84637275	50' 17' 305.43788191	27' Hector -221.41527115
15' King_henry -357.84637275	17' Enter -354.63171995	66' 56' 6.003124185
36' 11' 295.84853854999994	17' Messenger -354.63171995	56' 48' 47.321420515
11' France -445.5995114	50' 18' 272.73904785999997	48' 38' 80.53275000000002
11' England -445.5995114	18' 3' 525.4445261000001	38' Duke -133.3572947
51' Buckingham -49.14283428	3' Caesar -847.377412	38' Exit -133.3572947
59' 5' 736.785282	3' Antony -847.377412	48' Clown -52.8245447
5' Prince -736.285282	18' Cleopatra -321.9328859	56' 35' 150.204457915
5' Falstaff -736.285282	62' 53' 44.695497715	35' English -155.7075821
60' 57' 5.940328275	53' 44' 42.76277858499999	35' French -155.7075821
57' 40' 107.365045975	44' 37' 47.88055975	67' Macbeth 0.5
40' 25' 146.41157429999998	37' Exeunt -134.83883605	68' 47' 56.1942314
25' 14' 112.30362020000001	37' Brutus -134.83883605	47' Timon -55.6942314
14' York -371.52056875	44' Rome -86.9582763	47' Servant -55.6942314
14' Warwick -371.52056875	53' Speak -44.195497715	69' 54' 38.307279005
25' Richard -259.21694855	63' 6' 605.6844365	54' Antonio -37.807279005
40' 31' 65.86383415	6' Othello -605.1844365	54' Prospero -37.807279005
31' Edward -178.6692084	6' Iago -605.1844365	

Cluster V0.1

Using Complete Linkage

There are 70 samples.

Clustering procedure: Square Distance Matrix

Step	A	B	Distance
1	eye	York	0.0
2	Caesar	God	0.0
3	Buckingham	world	0.0
4	Antony	King	0.0
5	Henry	life	0.0
6	Hamlet	Gloucester	0.0
7	Suffolk	Prince	0.0
8	King_richard	King_henry	0.0
9	Falstaff	blood	0.0
10	Brutus	France	0.0
11	Rome	England	0.0
12	French	Queen	0.0
13	Messenger	Bolingbroke	0.0
14	Cleopatra	men	0.0
15	Othello	death	0.0
16	Iago	son	0.0
17	Troilus	long	0.0
18	Kent	day	0.0
19	Lear	hand	0.0
20	Hector	Enter	0.0
21	Clown	eyes	0.0
22	Timon	father	0.0
23	Macbeth	fair	0.0
24	Servant	sweet	0.0
25	Antonio	Warwick	0.0
26	Prospero	fear	0.0
27	English	6' 10.05484958	
28	17' Speak	10.05484958	
29	7' heaven	16.41340915	
30	26' Richard	18.10800928	
31	head Exeunt	23.35729982	
32	13' poor	26.57823467	
33	25' 24'	27.56529535	
34	Edward	man 45.25498269	
35	20' speak	46.19777742	
36	23' Duke	59.48710018	
37	28' 27'	63.63789445	
38	11' night	71.55756939	
39	19' 8'	74.32196749	
40	32' Exit	76.2722063	
41	21' 10'	114.0739094	
42	16' 40'	122.0150114	
43	12' 5'	148.5302222	

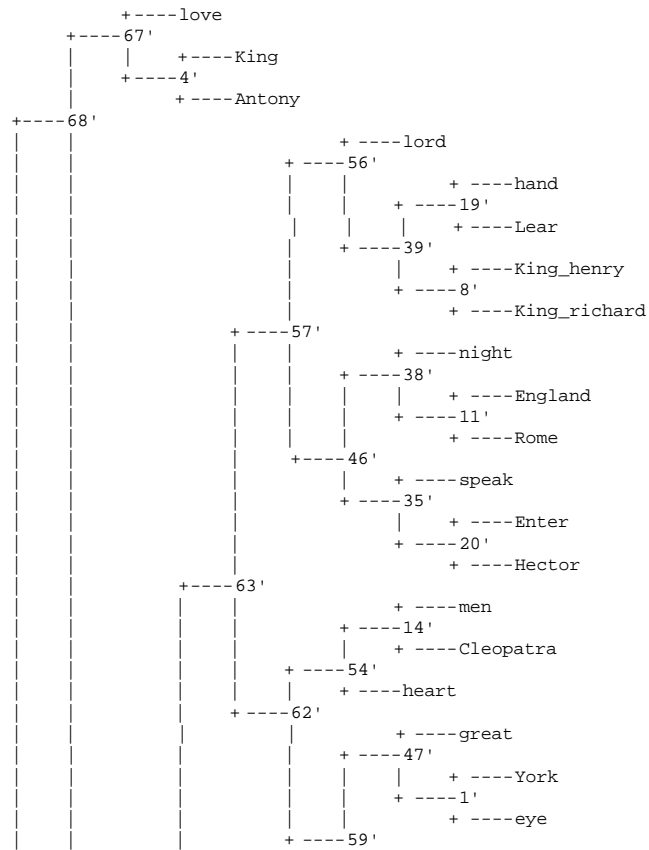
INTRATEXTUALITY -- Kent Palmer

44 30' 36' 149.4644676
 45 15' 31' 175.041488
 46 35' 38' 193.8720374
 47 1' great 203.1778773
 48 9' 3' 207.2259927
 49 44' 37' 218.1136427
 50 29' time 231.9508079
 51 33' 42' 259.0154155
 52 22' 18' 322.3042905

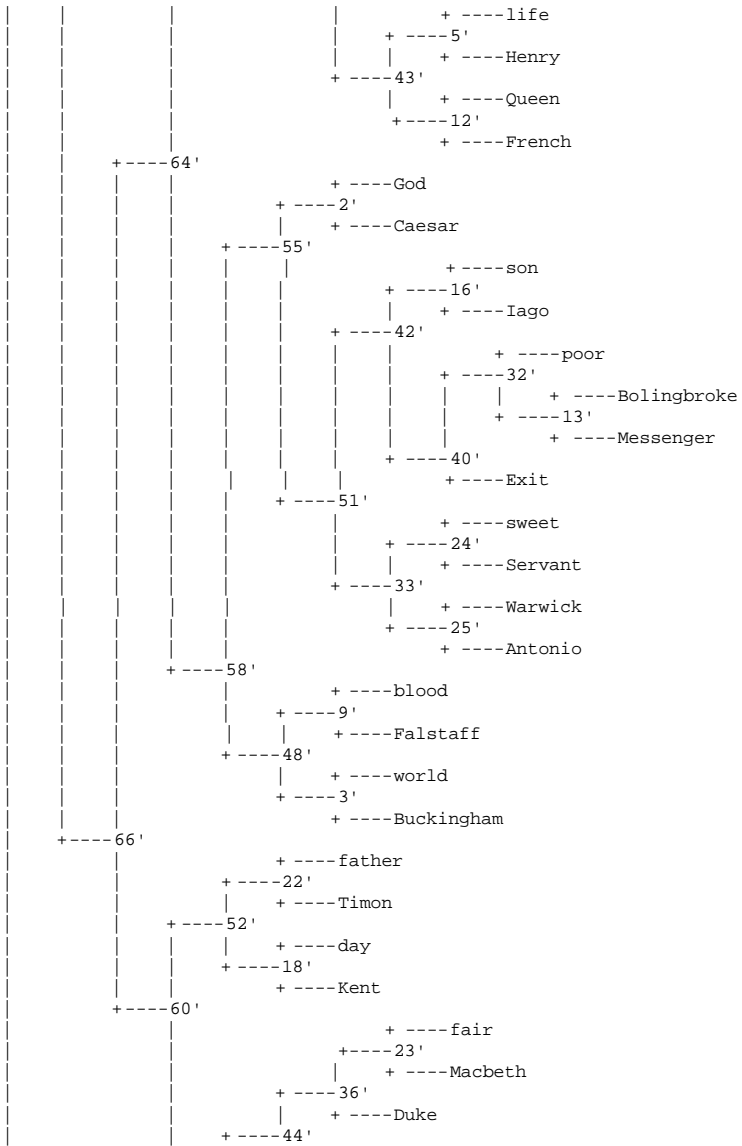
53 41' 45' 334.2738339
 54 14' heart 336.3955618
 55 51' 2' 337.0645739
 56 39' lord 352.8240213
 57 46' 56' 365.2097461
 58 55' 48' 408.4871671
 59 43' 47' 411.6189862
 60 49' 52' 420.2637739
 61 53' 50' 564.3248432

62 54' 59' 591.0988742
 63 57' 62' 616.2490967
 64 58' 63' 744.0411375
 65 61' 34' 751.443961
 66 60' 64' 1003.795987
 67 4' love 1195.09665
 68 66' 67' 1695.754824
 69 68' 65' 4425.828398

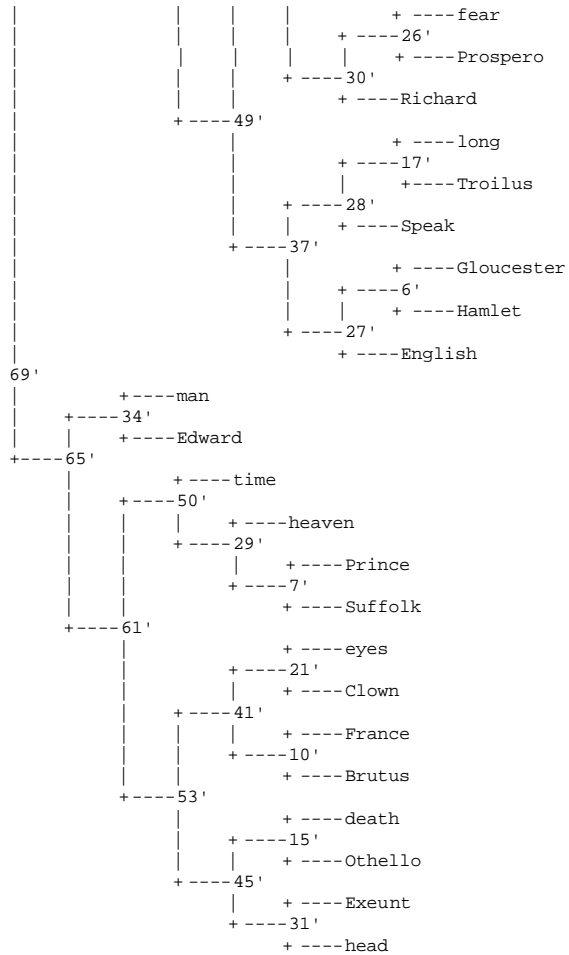
Tree Topology (edge lengths ignored)



INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



From	To	Length
69'	68'	1365.0367869999998
68'	67'	250.32908700000007
67'	love	597.548325
67'	4'	597.548325
4'	King	0.0

4'	Antony	0.0
68'	66'	345.97941850000007
66'	64'	129.87742475
64'	63'	63.8960204
63'	57'	125.51967529999999
57'	56'	6.192862399999996
56'	lord	176.41201065

56'	39'	139.251026905
39'	19'	37.160983745
19'	hand	0.0
19'	Lear	0.0
39'	8'	37.160983745
8'	King_henry	0.0
8'	King_richard	0.0

INTRATEXTUALITY -- Kent Palmer

57' 46' 85.66885435	42' 40' 22.871402550000006	30' Richard 9.05400464
46' 38' 61.15723400500001	40' 32' 24.846985814999996	49' 37' 77.237874125
38' night 35.778784695	32' poor 13.289117335	37' 28' 26.791522434999997
38' 11' 35.778784695	32' 13' 13.289117335	28' 17' 5.02742479
11' England 0.0	13' Bolingbroke 0.0	17' long 0.0
11' Rome 0.0	13' Messenger 0.0	17' Troilus 0.0
46' 35' 73.83712999000001	40' Exit 38.13610315	28' Speak 5.02742479
35' speak 23.09888871	51' 33' 115.72506007500002	37' 27' 26.791522434999997
35' 20' 23.09888871	33' 24' 13.782647675	27' 6' 5.02742479
20' Enter 0.0	24' sweet 0.0	6' Gloucester 0.0
20' Hector 0.0	24' Servant 0.0	6' Hamlet 0.0
63' 62' 12.57511125000002	33' 25' 13.782647675	27' English 5.02742479
62' 54' 127.35165619 999998	25' Warwick 0.0	69' 65' 1837.1922184 999999
54' 14' 168.1977809	25' Antonio 0.0	65' 34' 353.09448915499996
14' men 0.0	58' 48' 100.63058720000001	34' man 22.627491345
14' Cleopatra 0.0	48' 9' 103.61299635	34' Edward 22.627491345
54' heart 168.1977809	9' blood 0.0	65' 61' 93.55955889999996
62' 59' 89.73994399999998	9' Falstaff 0.0	61' 50' 166.18701765000003
59' 47' 104.22055445	48' 3' 103.61299635	50' time 115.97540395
47' great 101.58893865	3' world 0.0	50' 29' 107.768699375
47' 1' 101.58893865	3' Buckingham 0.0	29' heaven 8.206704575
1' York 0.0	66' 60' 291.76610655	29' 7' 8.206704575
1' eye 0.0	60' 52' 48.979741700000005	7' Prince 0.0
59' 43' 131.54438199999998	52' 22' 161.15214525	7' Suffolk 0.0
43' 5' 74.2651111	22' father 0.0	61' 53' 115.02550465000002
5' life 0.0	22' Timon 0.0	53' 41' 110.09996225
5' Henry 0.0	52' 18' 161.15214525	41' 21' 57.0369547
43' 12' 74.2651111	18' day 0.0	21' eyes 0.0
12' Queen 0.0	18' Kent 0.0	21' Clown 0.0
12' French 0.0	60' 49' 101.07506559999999	41' 10' 57.0369547
64' 58' 167.77698519999998	49' 44' 34.324587550000004	10' France 0.0
58' 55' 35.7112966	44' 36' 44.988683710000004	10' Brutus 0.0
55' 2' 168.53228695	36' 23' 29.74355009	53' 45' 79.61617295
2' God 0.0	23' fair 0.0	45' 15' 87.520744
2' Caesar 0.0	23' Macbeth 0.0	15' death 0.0
55' 51' 39.024579200000005	36' Duke 29.74355009	15' Othello 0.0
51' 42' 68.50020205000001	44' 30' 65.67822916	45' 31' 75.84209408999999
42' 16' 61.0075057	30' 26' 9.05400464	31' Exeunt 11.67864991
16' son 0.0	26' fear 0.0	31' head 11.67864991
16' Iago 0.0	26' Prospero 0.0	

Cluster V0.1

Using Weighted Centroid

INTRATEXTUALITY -- Kent Palmer

Unweighted Centroid Cluster A is treated as the centroid of clusters A1 and A2. The distance from A to B is the average of the distance from A1 to B, and the distance from A2 to B, corrected so that A lies on a line joining A1 and A2, in the abstract "metric" space. This is a recursive definition. The distance between a pair of single member clusters is just the distance between their member samples.

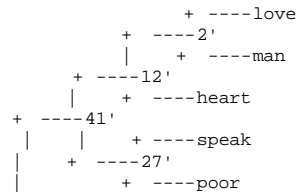
Weighted Centroid like the unweighted centroid method, but reduces the influence of large numbers of similar samples

There are 70 samples.

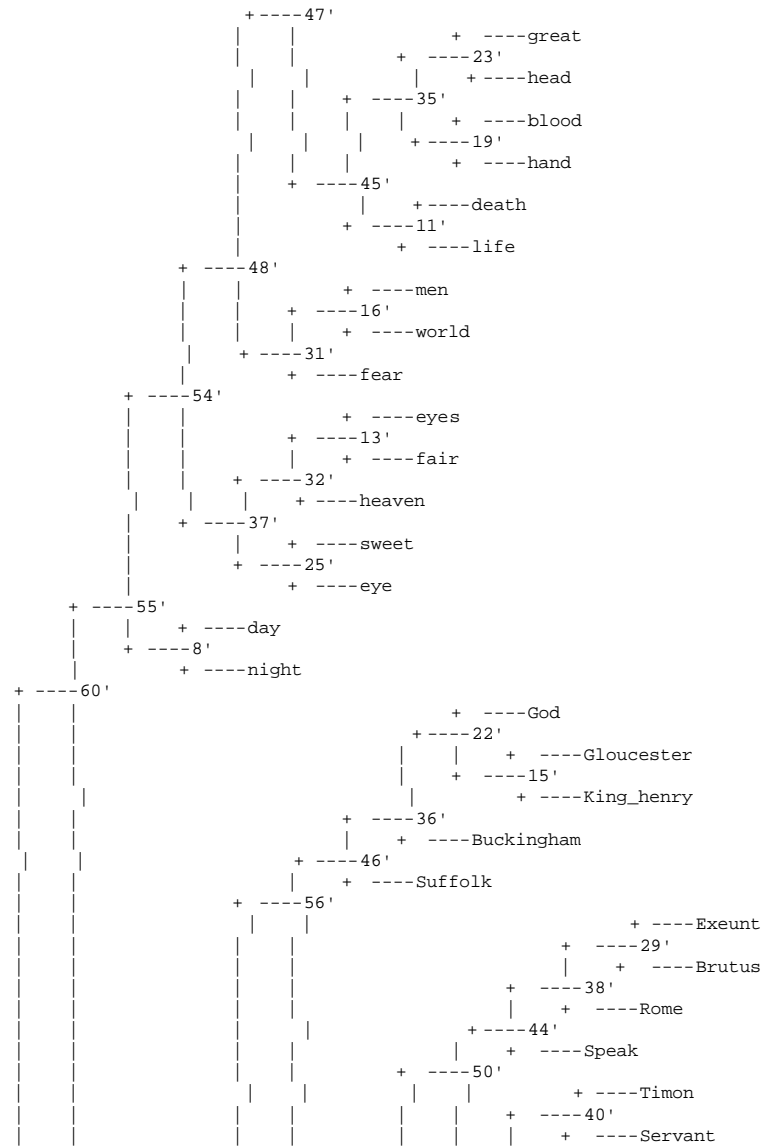
Clustering procedure: Square Similarity Matrix

Step	A	B	Distance
1	long time	-4424.828398	
2	man love	-1747.462519	
3	Antony Caesar	-1694.754824	
4	Queen King	-1678.089283	
5	Falstaff Prince	-1472.570564	
6	Iago Othello	-1210.368873	
7	Hamlet lord	-1002.795987	
8	night day	-993.3825761	
9	son father	-951.7392791	
10	England France	-891.1990228	
11	life death	-845.8591067	
12	heart 2'	-787.7715964000001	
13	fair eyes	-760.7653294	
14	Warwick York	-743.0411375	
15	King_henry Gloucester	-715.6927455	
16	world men	-711.9417235	
17	Messenger Enter	-709.2634399	
18	Lear Kent	-601.274394	
19	hand blood	-553.2900949	
20	Bolingbroke King_richard	-526.6331677	
21	Richard Edward	-508.5021992	
22	15' God	-479.31190267499994	
23	head great	-446.2441781	
24	Hector Troilus	-442.8305423	
25	eye sweet	-385.9633447	
26	Cleopatra 3'	-381.72445144999995	
27	poor speak	-313.0032171	
28	French English	-311.4151642	
29	Brutus Exeunt	-269.6776721	
30	Exit Duke	-266.7145894	
31	fear 16'	-247.22421477499998	
32	heaven 13'	-241.8067331	
33	Henry 14'	-207.96035427500001	
34	7' 4'	-166.40195040000003	
35	23' 19'	-166.38120444999998	
36	Buckingham 22'	-164.12082701875002	
37	25' 32'	-145.905355325	
38	Rome 29'	-136.529336325	
39	33' 21'	-130.80279480625	
40	Servant Timon	-111.3884628	
41	27' 12'	-79.57209571249997	
42	Prospero Antonio	-75.61455801	
43	Clown 30'	-54.66085959999998	
44	Speak 38'	-33.88984833375	
45	35' 11'	-28.57233913750001	
46	Suffolk 36'	-21.310120547187516	
47	45' 41'	5.0298994609375	
48	47' 31'	12.445692558203126	
49	40' Macbeth	16.62662985	
50	49' 44'	26.8535072190625	
51	42' 50'	31.193260016953126	
52	51' 43'	28.615848590722656	
53	28' 10'	31.591912074999996	
54	37' 48'	42.865819579 394525	
55	54' 8'	50.49438404016116	
56	52' 46'	60.26522776623536	
57	56' 53'	90.11969648482055	
58	57' 39'	122.27870563059966	
59	58' 9'	136.7408255568052	
60	59' 55'	150.09810328068	
61	60' 20'	162.4900104970899	
62	61' 24'	175.57520250833014	
63	62' 17'	198.2127 4965908205	
64	63' 18'	195.22345614607573	
65	64' 34'	296.31300930814893	
66	65' 5'	394.12452488453744	
67	66' 26'	443.21634675810367	
68	67' 6'	418.57024951360575	
69	68' 1'	1143.0423190839917	

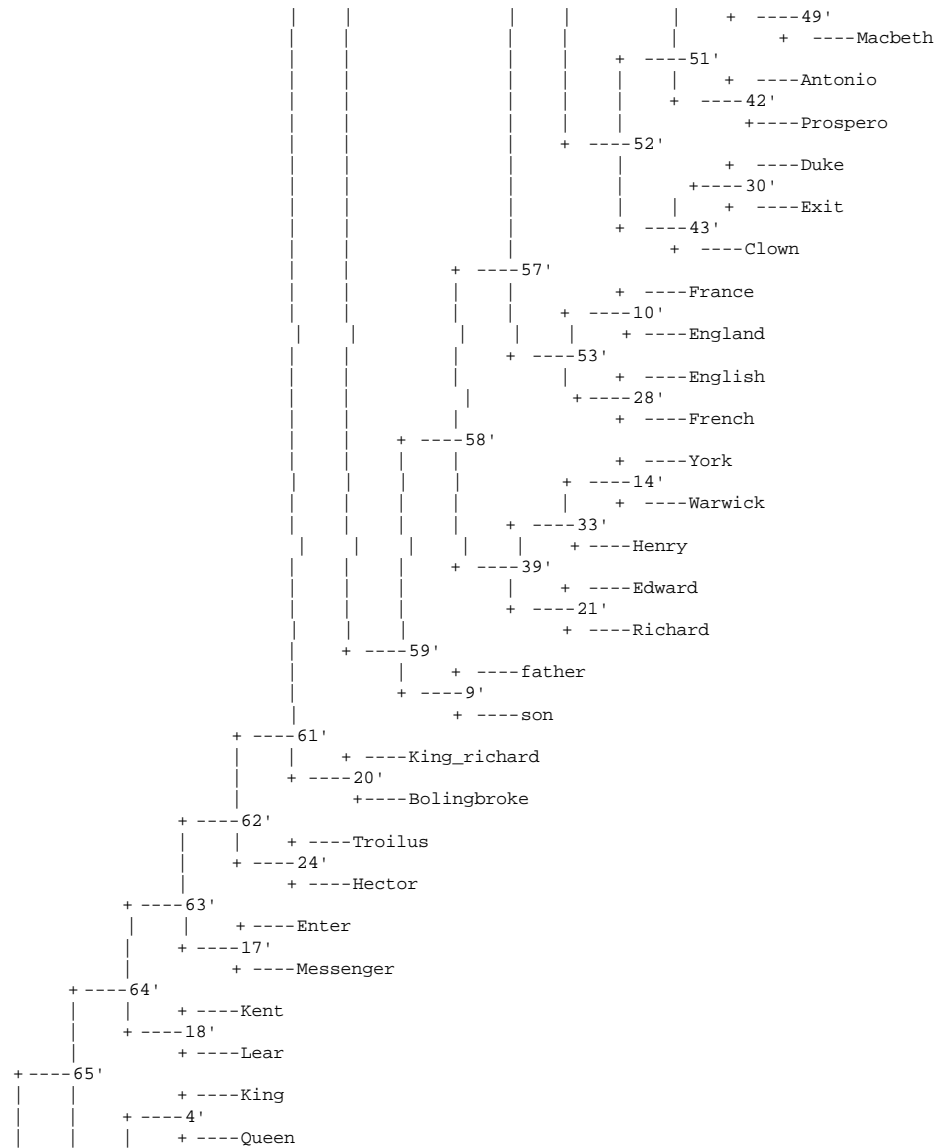
Tree Topology (edge lengths ignored)



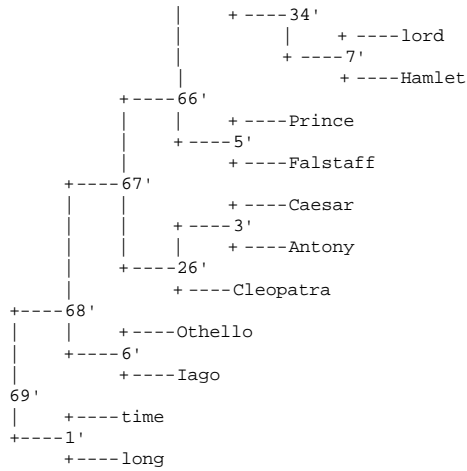
INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



From	To	Length			
69'	68'	362.236034785193	23'	great	-223.12208905
68'	67'	-12.323048622248962	23'	head	-223.12208905
67'	66'	24.545910936783116	35'	19'	193.454445225
66'	65'	48.90575778819425	19'	blood	-276.64504745
65'	64'	50.5447765810366	19'	hand	-276.64504745
64'	63'	-1.4946467565031583	45'	11'	408.64338378125
63'	62'	11.318773575375957	11'	death	-422.92955335
62'	61'	6.542596005620112	11'	life	-422.92955335
61'	60'	6.1959536082049596	48'	31'	129.83495366660156
60'	55'	49.80185962025942	31'	16'	232.3587543625
55'	54'	3.8142822303833164	16'	men	-355.97086175
54'	48'	15.210063510595699	16'	world	-355.97086175
48'	47'	3.707896548632813	31'	fear	-123.61210738749999
47'	41'	42.300997586718736	54'	37'	94.38558745219726
41'	12'	354.0997503437501	37'	32'	47.95068888750001
12'	2'	479.8454612999999	32'	13'	259.47929815000003
2'	love	-873.7312595	13'	eyes	-380.3826647
2'	man	-873.7312595	13'	fair	-380.3826647
12'	heart	-393.88579820000007	32'	heaven	-120.90336655
41'	27'	116.71556069375	37'	25'	120.0289946875
27'	speak	-156.50160855	25'	sweet	-192.98167235
27'	poor	-156.50160855	25'	eye	-192.98167235
47'	45'	16.801119299218755	55'	8'	521.9384800700806
45'	35'	68.90443265624998	8'	day	-496.69128805
35'	23'	139.931486825	8'	night	-496.69128805
			60'	59'	6.678638861937401
			59'	58'	7.231059963102766
			58'	57'	16.079504572889554
			57'	56'	14.92723435929259 4
			56'	46'	40.78767415671144
			46'	36'	71.40535323578125
			36'	22'	157.59553782812498
			22'	God	-239.65595133749997
			22'	15'	118.19042141250003
			15'	Gloucester	-357.84637275
			15'	King_henry	-357.84637275
			36'	Buckingham	-82.06041350937501
			46'	Suffolk	-10.655060273593 758
			56'	52'	15.824689587756353
			52'	51'	-1.2887057131152346
			51'	50'	2.1698763989453127
			50'	44'	30.37167777640625
			44'	38'	51.319743995625004
			38'	29'	66.5741678875
			29'	Exeunt	-134.83883605
			29'	Brutus	-134.83883605
			38'	Rome	-68.2646681625
			44'	Speak	-16.944924166875
			50'	49'	5.11343868453125
			49'	40'	64.00754632499999
			40'	Timon	-55.6942314
			40'	Servant	-55.6942314
			49'	Macbeth	8.313314925
			51'	42'	53.403909013476564

INTRATEXTUALITY -- Kent Palmer

42' Antonio -37.807279005	39' 21' 188.849702196875	4' King -839.0446415
42' Prospero -37.807279005	21' Edward -254.2510996	4' Queen -839.0446415
52' 43' 41.63835409536132	21' Richard -254.2510996	34' 7' 418.19701829999997
43' 30' 106.02686490000 002	59' 9' 544.2400523284026	7' lord -501.3979935
30' Duke -133.3572947	9' father -475.86963955	7' Hamlet -501.3979935
30' Exit -133.3572947	9' son -475.86963955	66' 5' 933.3475444422688
43' Clown -27.33042979999999	61' 20' 344.5615890985449	5' Prince -736.285282
57' 53' 29.263892204910277	20' King_richard -263.31658385	5' Falstaff -736.285282
53' 10' 461.3954674375	20' Bolingbroke -263.31658385	67' 26' 412.4703991040518
10' France -445.5995114	62' 24' 309.2028724041651	26' 3' 656.5151862750001
10' England -445.5995114	24' Troilus -221.41527115	3' Caesar -847.377412
53' 28' 171.5035381375	24' Hector -221.41527115	3' Antony -847.377412
28' English -155.7075821	63' 17' 453.73809477954103	26' Cleopatra -190.86222572499997
28' French -155.7075821	17' Enter -354.63171995	68' 6' 814.4695612568028
58' 39' 126.54075021842483	17' Messenger -354.63171995	6' Othello -605.1844365
39' 33' 38.578779734375004	64' 18' 398.24892507303787	6' Iago -605.1844365
33' 14' 267.5403916125	18' Kent -300.637197	69' 1' 2783.935358541996
14' York -371.52056875	18' Lear -300.637197	1' time -2212.414199
14' Warwick -371.52056875	65' 34' 231.35747985407448	1' long -2212.414199
33' Henry -103.98017713750001	34' 4' 755.8436663	

Cluster V0.1

Using Weighted Centroid

There are 70 samples.

Clustering procedure: Square Distance Matrix

Step	A	B	Distance
1	eye York	0.0	
2	Caesar God	0.0	
3	Buckingham world	0.0	
4	Antony King	0.0	
5	Henry life	0.0	
6	Hamlet Gloucester	0.0	
7	Suffolk Prince	0.0	
8	King_richard King_henry	0.0	
9	Falstaff blood	0.0	
10	Brutus France	0.0	
11	Rome England	0.0	
12	French Queen	0.0	
13	Messenger Bolingbroke	0.0	
14	Cleopatra men	0.0	
15	Othello death	0.0	
16	Iago son	0.0	
17	Troilus long	0.0	
18	Kent day	0.0	
19	Lear hand	0.0	
20	Hector Enter	0.0	
21	Clown eyes	0.0	
22	Timon father	0.0	
23	Macbeth fair	0.0	
24	Servant sweet	0.0	
25	Antonio Warwick	0.0	
26	Prospero fear	0.0	
27	English 6'	5.02742479	
28	17' Speak	5.02742479	
29	26' Richard	9.05400464	
30	25' 24'	13.52043527	
31	13' 7'	14.7384362525	
32	28' 31'	14.547004930624999	
33	12' heaven	22.42920769	
34	head Exeunt	23.35729982	
35	20' 15'	24.4455674875	
36	32' Edward	28.59537978578125	
37	23' 36'	26.722204408945313	
38	19' 8'	29.354841127500002	
39	37' Duke	31.910894770986324	
40	29' 27'	38.638252131875	
41	30' 11'	39.85805228625	
42	40' 16'	43.13346701828126	
43	21' 10'	43.691376195	
44	42' 41'	44.93591729050781	
45	44' 39'	43.48398522374268	
46	Exit poor	47.63944282	
47	45' 38'	48.37959325247376	
48	47' 14'	63.89600695113602	
49	43' 35'	64.579832479375	
50	48' 49'	68.71725389902912	
51	50' 46'	66.13936552891501	
52	51' 33'	71.00861607469334	

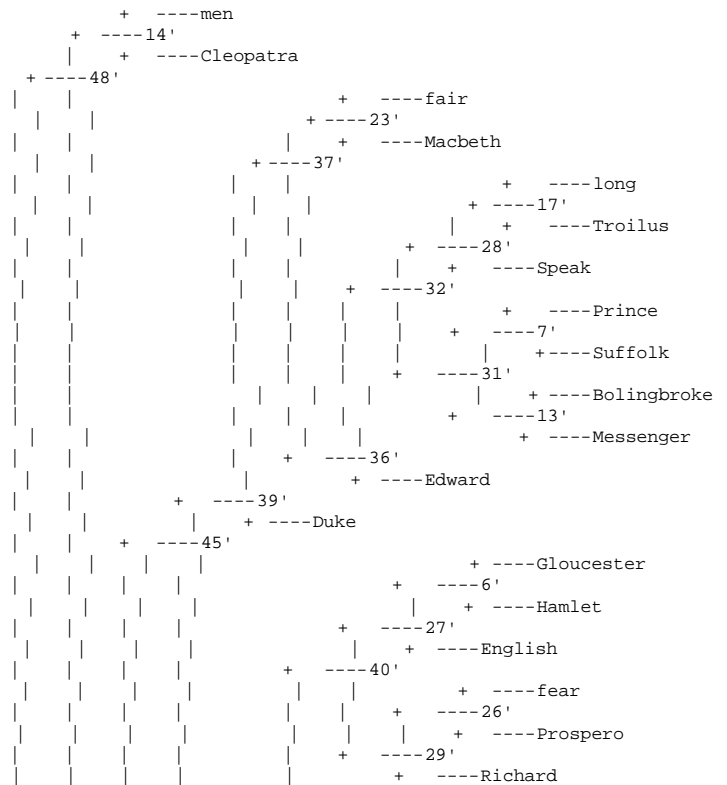
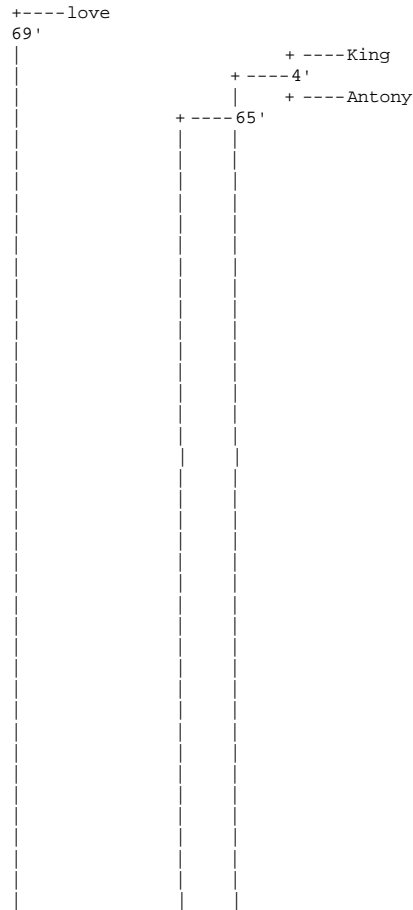
INTRATEXTUALITY -- Kent Palmer

53 52' 22' 77.03531920194177
 54 53' 34' 75.64933949418845
 55 9' 3' 77.9122590075
 56 54' 18' 81.91009467317693
 57 56' 5' 78.73912881979692
 58 57' 55' 85.18946444031855

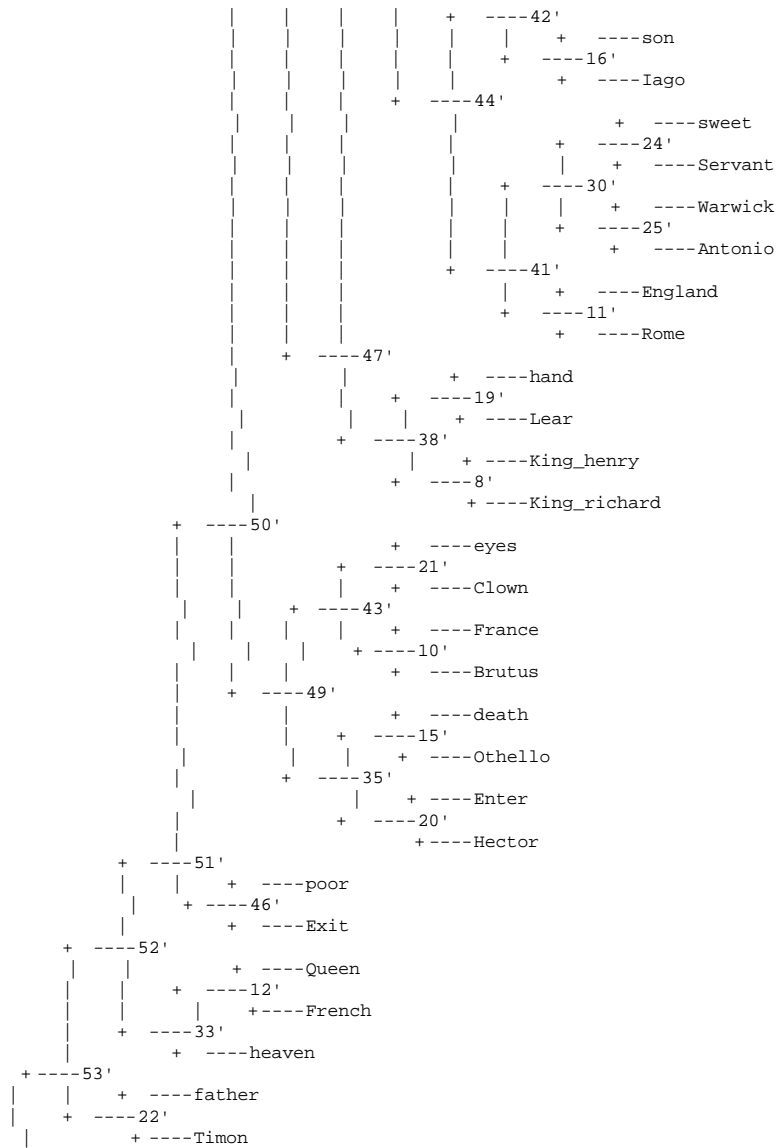
59 58' 1' 89.79991906543528
 60 59' speak 115.52572330187148
 61 60' night 96.10998021960543
 62 61' 2' 151.2019589161789
 63 62' great 205.9072926542387
 64 63' heart 313.1482761348544

65 64' 4' 328.83864259094685
 66 65' time 337.21774626789374
 67 66' lord 326.5291458066406
 68 67' man 669.5129339630303
 69 68' love 1192.0271249844707

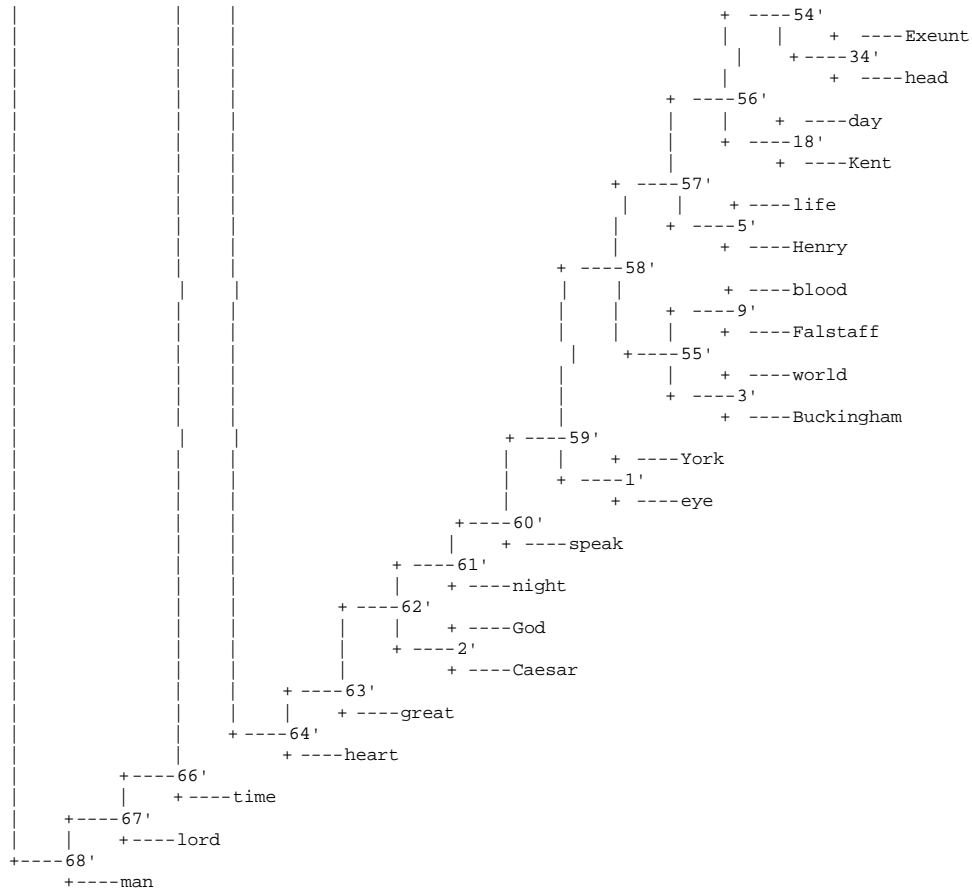
Tree Topology (edge lengths ignored)



INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



From	To	Length			
=====			4' Antony	0.0	
69'	love	596.0135624922353	65'	64'	7.84518322804621
69'	68'	261.2570955107202	64'	63'	53.62049174030787
68'	67'	171.49189407819483	63'	62'	27.35266686902989
67'	66'	-5.344300230626573	62'	61'	27.54598934828674
66'	65'	4.189551838473449	61'	60'	-9.707871541133024
65'	4'	164.41932129547342	60'	59'	12.862902118218102
4'	King	0.0	59'	58'	2.3052273125583653
			58'	57'	3.225167810260814
			57'	56'	-1.5854829266900055
			56'	54'	3.1303775894942376
			54'	53'	-0.6929898538766608
			53'	52'	3.0133515636242194
			52'	51'	2.434625272889164
			51'	50'	-1.2889441850570549
			50'	48'	2.410623473946547
			48'	14'	31.94800347556801
			14'	men	0.0

INTRATEXTUALITY -- Kent Palmer

14' Cleopatra 0.0	16' son 0.0	52' 33' 24.28970419234667
48' 47' 7.758206849331131	16' Iago 0.0	33' 12' 11.214603845
47' 45' 2.4478040143655413	44' 41' 2.5389325021289046	12' Queen 0.0
45' 39' 5.786545226378177	41' 30' 13.168808508125	12' French 0.0
39' 37' 2.594345181020506	30' 24' 6.760217635	33' heaven 11.214603845
37' 23' 13.361102204472656	24' sweet 0.0	53' 22' 38.51765960097089
23' fair 0.0	24' Servant 0.0	22' father 0.0
23' Macbeth 0.0	30' 25' 6.760217635	22' Timon 0.0
37' 36' -0.9365876884179691	25' Warwick 0.0	54' 34' 26.146019837094226
36' 32' 7.024187427578126	25' Antonio 0.0	34' Exeunt 11.67864991
32' 28' 4.7597900703125	41' 11' 19.929026143125	34' head 11.67864991
28' 17' 2.513712395	11' England 0.0	56' 18' 40.95504733 6588464
17' long 0.0	11' Rome 0.0	18' day 0.0
17' Troilus 0.0	47' 38' 9.51237606248688	18' Kent 0.0
28' Speak 2.513712395	38' 19' 14.677420563750001	57' 5' 39.36956440989846
32' 31' -0.0957156609375005	19' hand 0.0	5' life 0.0
31' 7' 7.36921812625	19' Lear 0.0	5' Henry 0.0
7' Prince 0.0	38' 8' 14.677420563750001	58' 55' 3.638602716409274
7' Suffolk 0.0	8' King_henry 0.0	55' 9' 38.95612950375
31' 13' 7.36921812625	8' King_richard 0.0	9' blood 0.0
13' Bolingbroke 0.0	50' 49' 2.0687107098270587	9' Falstaff 0.0
13' Messenger 0.0	49' 43' 10.444228142187502	55' 3' 38.95612950375
36' Edward 14.297689892890626	43' 21' 21.8456880975	3' world 0.0
39' Duke 15.95544738549316 2	21' eyes 0.0	3' Buckingham 0.0
45' 44' -0.7259660333825657	21' Clown 0.0	59' 1' 44.89995953271764
44' 42' 0.9012251361132755	43' 10' 21.8456880975	1' York 0.0
42' 40' 2.2476074432031297	10' France 0.0	1' eye 0.0
40' 27' 16.8054136709375	10' Brutus 0.0	60' speak 57.76286165093574
27' 6' 2.513712395	49' 35' 20.0671324959375	61' night 48.054990109802716
6' Gloucester 0.0	35' 15' 12.22278374375	62' 2' 75.60097945808945
6' Hamlet 0.0	15' death 0.0	2' God 0.0
27' English 2.513712395	15' Othello 0.0	2' Caesar 0.0
40' 29' 14.792123745937499	35' 20' 12.22278374375	63' great 102.95364632711934
29' 26' 4.52700232	20' Enter 0.0	64' heart 156.5741380674272
26' fear 0.0	20' Hector 0.0	66' time 168.60887313394687
26' Prospero 0.0	51' 46' 9.249961354457504	67' lord 163.2645729033203
29' Richard 4.52700232	46' poor 23.81972141	68' man 334.75646698151513
42' 16' 21.56673350914063	46' Exit 23.81972141	

Cluster V0.1

Using Ward's Minimum Variance

Ward's Minimum Variance the increase in the mean squared deviation (from a sample to the centroid of its containing cluster) that would occur if clusters A and B were fused

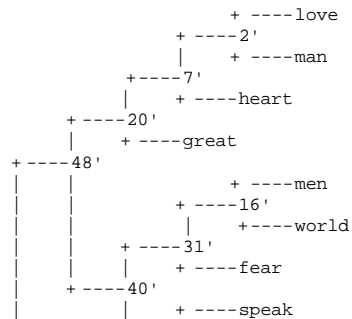
There are 70 samples.

INTRATEXTUALITY -- Kent Palmer

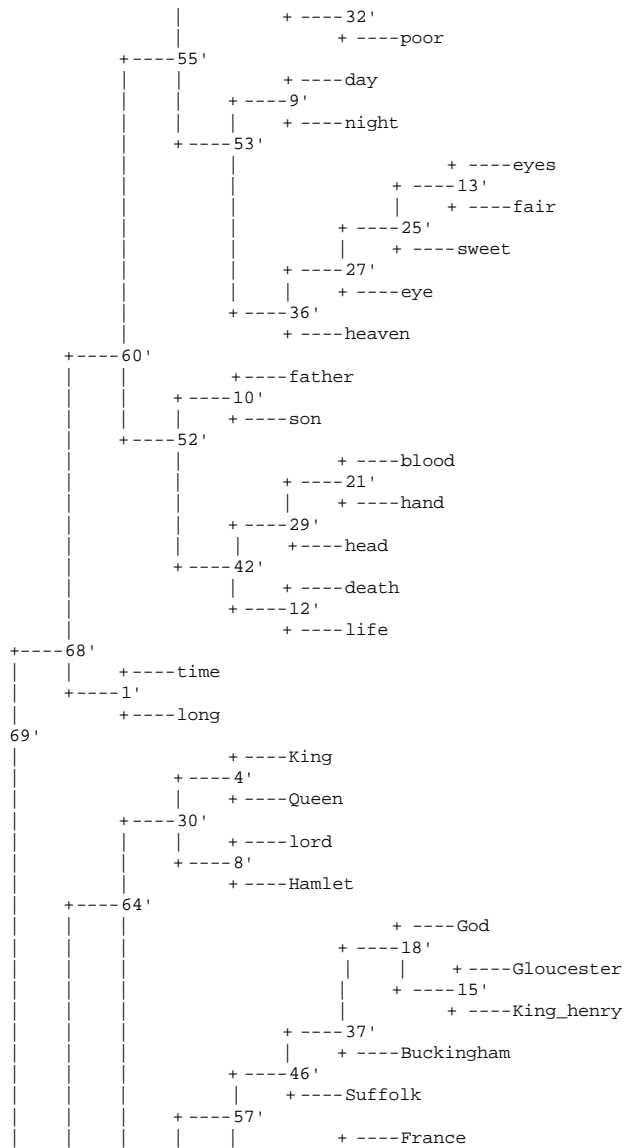
Clustering procedure: Square Similarity Matrix

Step	A	B	Distance
1	long time	-4424.828398	
2	man love	-1747.462519	
3	Antony Caesar	-1694.754824	
4	Queen King	-1678.089283	
5	Falstaff Prince	-1472.570564	
6	Iago Othello	-1210.368873	
7	heart 2'	-1050.3621285333336	
8	Hamlet lord	-1002.795987	
9	night day	-993.3825761	
10	son father	-951.7392791	
11	England France	-891.1990228	
12	life death	-845.8591067	
13	fair eyes	-760.7653294	
14	Warwick York	-743.0411375	
15	King_henry Gloucester	-715.6927455	
16	world men	-711.9417235	
17	Messenger Enter	-709.2634399	
18	15' God	-639.0825368999999	
19	Lear Kent	-601.274394	
20	great 7'	-567.4534041166667	
21	hand blood	-553.2900949	
22	Bolingbroke King_richard	-526.6331677	
23	Cleopatra 3'	-508.9659352666666	
24	Richard Edward	-508.5021992	
25	sweet 13'	-449.3271366666666	
26	Hector Troilus	-442.8305423	
27	eye 25'	-414.1004341833332	
28	24' 14'	-402.4734678	
29	head 21'	-348.77214096666665	
30	8' 4'	-332.8039008000006	
31	fear 16'	-329.6322863666666	
32	poor speak	-313.0032171	
33	French English	-311.4151642	
34	Brutus Exeunt	-269.6776721	
35	Exit Duke	-266.7145894	
36	27' heaven	-237.1381125500001	
37	Buckingham 18'	-225.70414525	
38	Henry 28'	-217.35281614000004	
39	Rome 34'	-182.0391151	
40	32' 31'	-123.16779259333335	
41	Servant Timon	-111.3884628	
42	29' 12'	-96.93683459333336	
43	Prospero Antonio	-75.61455801	
44	Clown 35'	-72.8811461333333	
45	Speak 39'	-35.352617855000005	
46	Suffolk 37'	-33.176603694000015	
47	41' Macbeth	22.1688398	
48	40' 20'	29.695232410000123	
49	33' 11'	63.18382414999999	
50	43' 44'	76.28649617133333	
51	50' 47'	114.449882502	
52	42' 10'	150.06401168857138	
53	36' 9'	199.5425389	
54	51' 45'	221.891372865	
55	53' 48'	277.5385288	
56	54' 17'	347.9498302885714	
57	49' 46'	448.34229835844445	
58	56' 26'	451.381470260 1785	
59	58' 22'	478.2925054501389	
60	55' 52'	539.7065843036024	
61	59' 19'	567.608376042111	
62	57' 38'	725.3121187526984	
63	61' 6'	1148.164584429909	
64	62' 30'	1328.1663133284126	
65	63' 5'	1331.157453809091	
66	65' 23'	1773.3899714851855	
67	66' 64'	2460.0512 963208157	
68	60' 1'	3422.5002630694257	
69	67' 68'	4315.612140696084	

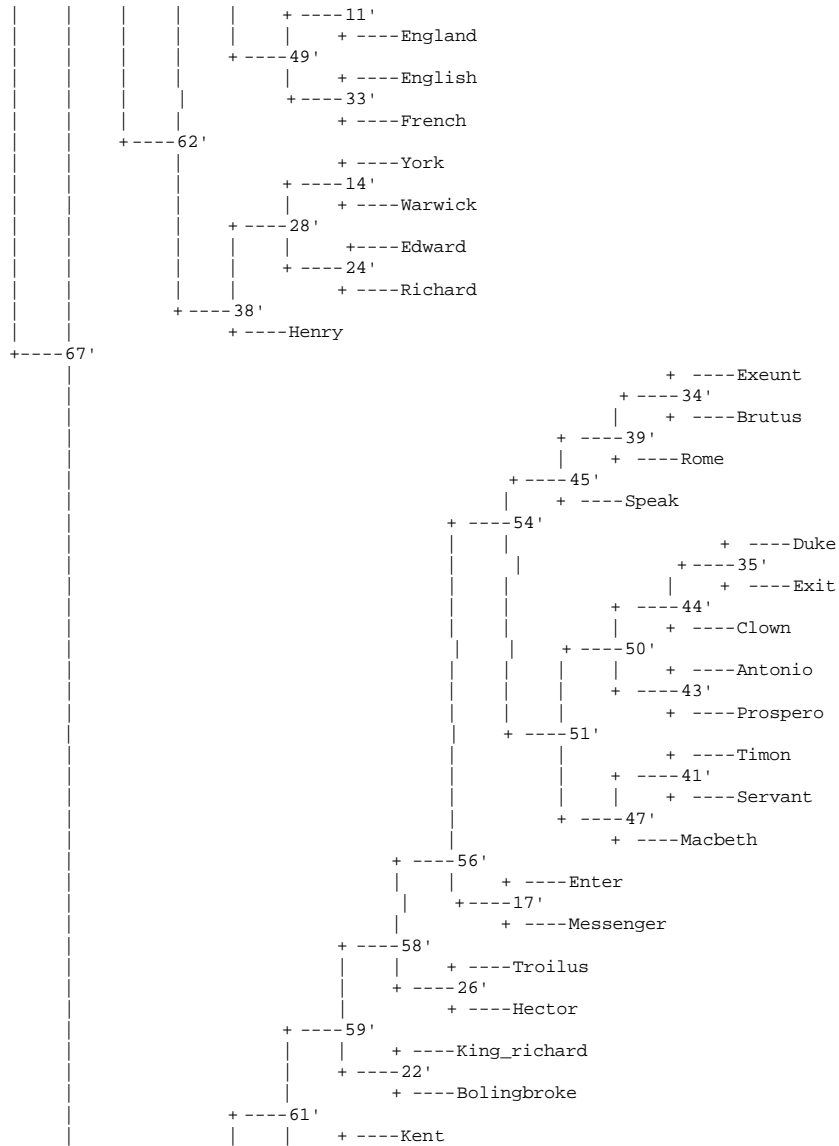
Tree Topology (edge lengths ignored)



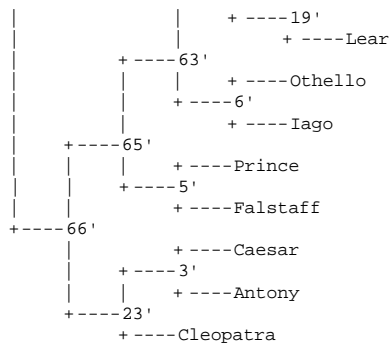
INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



From	To	Length
69'	68'	446.555938813329
68'	60'	1441.3968393829116
60'	55'	131.08402775180122
55'	48'	123.92164819499993
48'	20'	298.5743182633334
20'	7'	241.45436220833346
7'	2'	348.55019523333317
2'	love	-873.7312595
2'	man	-873.7312595
7'	heart	-525.1810642666668
20'	great	-283.72670205833333
48'	40'	76.43151250166673
40'	31'	103.23224688666664
31'	16'	191.15471856666667
16'	men	-355.97086175
16'	world	-355.97086175
31'	fear	-164.8161431833333
40'	32'	94.91771225333332
32'	speak	-156.50160855
32'	poor	-156.50160855
55'	53'	38.99799494999999
53'	9'	596.4625575
9'	day	-496.69128805
9'	night	-496.69128805
53'	36'	218.34032572500007
36'	27'	88.48116081666656
27'	25'	17.61335124166669
25'	13'	155.71909636666672
13'	eyes	-380.3826647
13'	fair	-380.3826647

25'	sweet	-224.6635683333333
27'	eye	-207.0502170916666
36'	heaven	-118.56905627500005
60'	52'	194.82128630751552
52'	10'	550.9016453942857
10'	father	-475.86963955
10'	son	-475.86963955
52'	42'	123.50042314095236
42'	29'	125.91765318666666
29'	21'	102.25897696666667
21'	blood	-276.64504745
21'	hand	-276.64504745
29'	head	-174.38607048333333
42'	12'	374.4611360533333
12'	death	-422.92955335
12'	life	-422.92955335
68'	1'	3923.6643305347125
1'	time	-2212.414199
1'	long	-2212.414199
69'	67'	927.780422187634
67'	64'	565.9424914962016
64'	30'	830.4851070642063
30'	4'	672.6426911
4'	King	-839.0446415
4'	Queen	-839.0446415
30'	8'	334.99604309999995
8'	lord	-501.3979935
8'	Hamlet	-501.3979935
64'	62'	301.42709728785707
62'	57'	138.484910197127
57'	46'	240.75945102622222
46'	37'	96.263770778

37'	18'	206.68919582499996
18'	God	-319.54126844999996
18'	15'	38.30510430000004
15'	Gloucester	-357.84637275
15'	King_henry	-357.84637275
37'	Buckingham	-112.852072625
46'	Suffolk	-16.588301847000007
57'	49'	192.57923710422222
49'	11'	477.19142347499997
11'	France	-445.5995114
11'	England	-445.5995114
49'	33'	187.299494175
33'	English	-155.7075821
33'	French	-155.7075821
62'	38'	471.33246744634926
38'	28'	92.56032582999997
28'	14'	170.28383485
14'	York	-371.52056875
14'	Warwick	-371.52056875
28'	24'	53.01436570000001
24'	Edward	-254.2510996
24'	Richard	-254.2510996
38'	Henry	-108.67640807000002
67'	66'	343.3306624178151
66'	65'	221.1162588380472
65'	63'	91.49643468959107
63'	61'	290.27810419389897
61'	59'	44.65793529598605
59'	58'	13.455517594980194
58'	56'	51.71581998580356
56'	54'	63.02922871178569
54'	45'	128.62199536

INTRATEXTUALITY -- Kent Palmer

45' 39' 73.3432486225	43' Prospero -37.807279005	61' 19' 584.4413850210556
39' 34' 43.819278499999996	51' 47' 46.140521351	19' Kent -300.637197
34' Exeunt -134.83883605	47' 41' 66.7786513	19' Lear -300.637197
34' Brutus -134.83883605	41' Timon -55.6942314	63' 6' 1179.2667287149543
39' Rome -91.01955755	41' Servant -55.6942314	6' Othello -605.1844365
45' Speak -17.676308927500003	47' Macbeth 11.0844199	6' Iago -605.1844365
54' 51' 53.7207451815	56' 17' 528.6066350942857	65' 5' 1401.8640089045457
51' 50' 19.081693165333334	17' Enter -354.63171995	5' Prince -736.285282
50' 44' 74.583821152333331	17' Messenger -354.63171995	5' Falstaff -736.285282
44' 35' 96.916721633333337	58' 26' 447.1060062800892	66' 23' 1141.177953375926
35' Duke -133.3572947	26' Troilus -221.41527115	23' 3' 592.8944443666668
35' Exit -133.3572947	26' Hector -221.41527115	3' Caesar -847.377412
44' Clown -36.440573066666665	59' 22' 502.46283657506945	3' Antony -847.377412
50' 43' 75.950527090666667	22' King_richard -263.31658385	23' Cleopatra -254.4829676333333
43' Antonio -37.807279005	22' Bolingbroke -263.31658385	

Cluster V0.1

Using Ward's Minimum Variance

There are 70 samples.

Clustering procedure: Square Distance Matrix

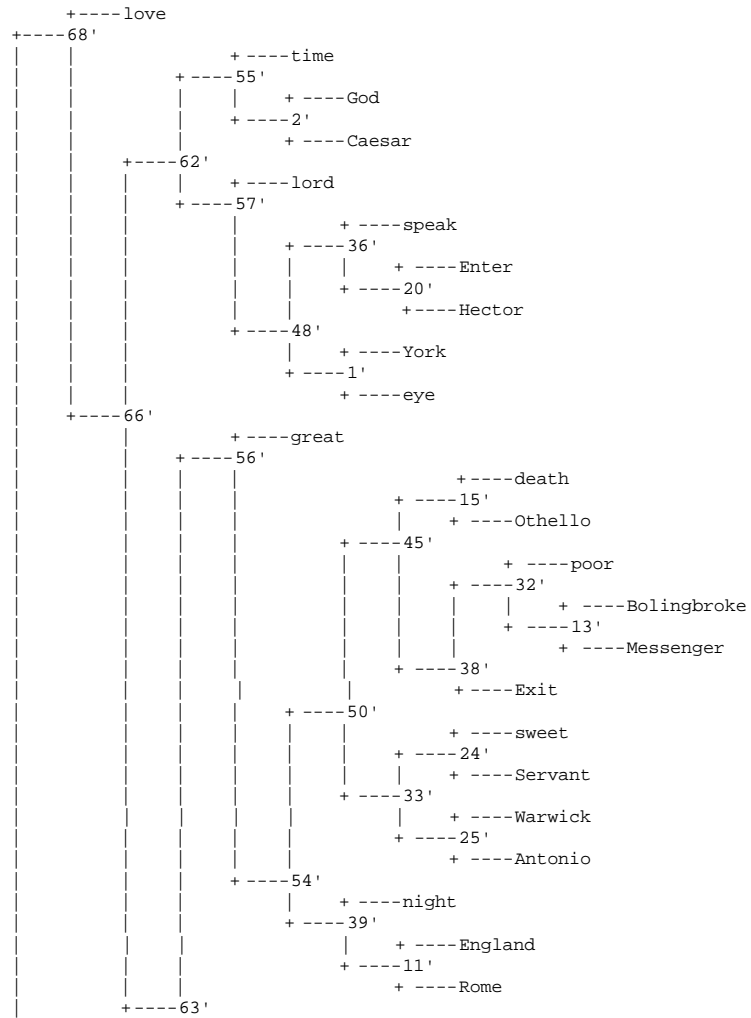
Step	A	B	Distance
1	eye	York	0.0
2	Caesar	God	0.0
3	Buckingham	world	0.0
4	Antony	King	0.0
5	Henry	life	0.0
6	Hamlet	Gloucester	0.0
7	Suffolk	Prince	0.0
8	King_richard	King_henry	0.0
9	Falstaff	blood	0.0
10	Brutus	France	0.0
11	Rome	England	0.0
12	French	Queen	0.0
13	Messenger	Bolingbroke	0.0
14	Cleopatra	men	0.0
15	Othello	death	0.0
16	Iago	son	0.0
17	Troilus	long	0.0
18	Kent	day	0.0
19	Lear	hand	0.0
20	Hector	Enter	0.0
21	Clown	eyes	0.0
22	Timon	father	0.0
23	Macbeth	fair	0.0
24	Servant	sweet	0.0
25	Antonio	Warwick	0.0
26	Prospero	fear	0.0
27	English	6'	6.703233053333334
28	17'	Speak	6.703233053333334
29	26'	Richard	12.072006186666668
30	7'	heaven	21.584954133333337
31	head	Exeunt	23.35729982
32	13'	poor	25.08088804
33	25'	24'	27.04087054
34	23'	Duke	39.658066786666666
35	28'	Edward	44.025166026666667
36	20'	speak	45.68026838
37	19'	8'	58.709682255000004
38	32'	Exit	66.48086278
39	11'	night	69.196470673333334
40	21'	10'	87.38275239
41	16'	27'	110.85576295066667
42	35'	30'	111.29028252666669
43	29'	41'	128.84412045183333
44	22'	12'	136.034861
45	15'	38'	145.02948485
46	9'	3'	155.824518015
47	34'	42'	174.25128834333333
48	36'	1'	188.70560849999998
49	18'	5'	192.556675415
50	33'	45'	198.03322089399998
51	43'	heart	200.84979379527778
52	44'	31'	229.22199206000005
53	37'	14'	238.52502093166666
54	50'	39'	254.2199160580513
55	2'	time	287.8868677333333
56	54'	great	296.57721997890116
57	48'	lord	299.89147713333335
58	47'	53'	303.2129116033333
59	51'	40'	324.59287667376077
60	52'	49'	337.27787506700001
61	60'	46'	412.1718936801429
62	57'	55'	459.8627958466668
63	56'	61'	482.00211787
64	59'	58'	482.99146777984095
65	64'	man	581.8452713052873
66	63'	62'	635.6137420701028
67	65'	4'	747.4872684202085

INTRATEXTUALITY -- Kent Palmer

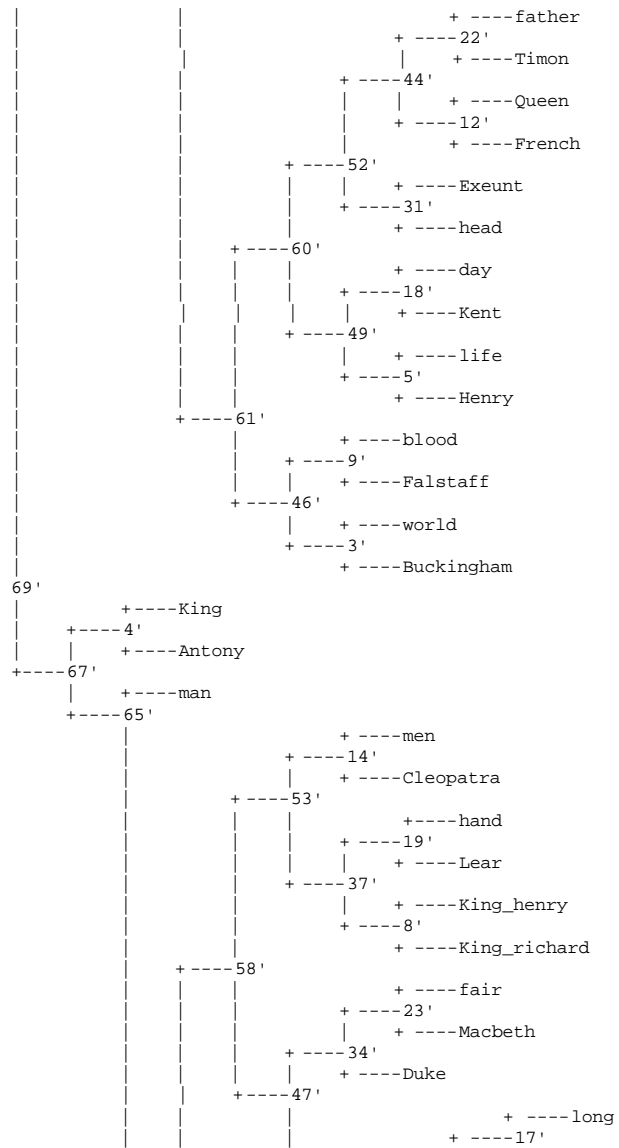
68 66' love 789.0618108251 35

69 67' 68' 938.9715959405537

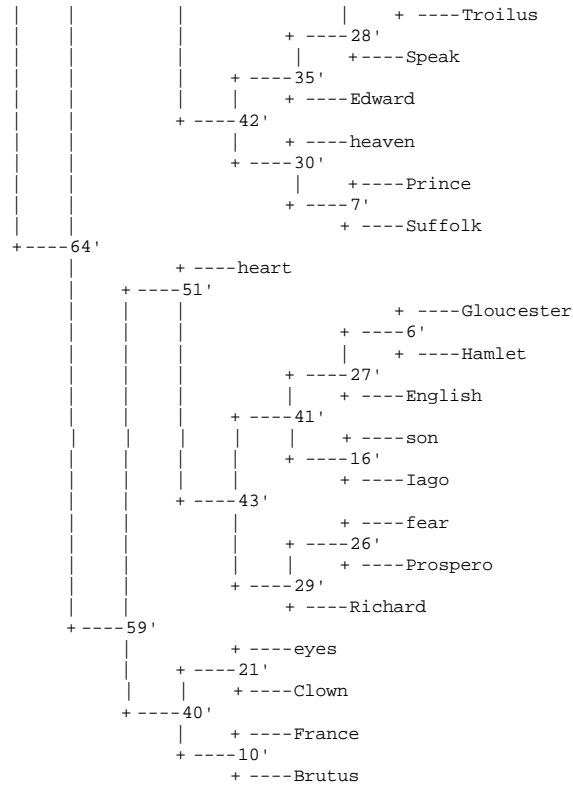
Tree Topology (edge lengths ignored)



INTRATEXTUALITY -- Kent Palmer



INTRATEXTUALITY -- Kent Palmer



From	To	Length		
69'	68'	74.95489255770934	48' 36'	71.51267005999999
68'	love	394.5309054125675	36'	speak 22.84013419
68'	66'	76.72403437751609	36'	20' 22.84013419
66'	62'	87.87547311171801	20'	Enter 0.0
62'	55'	85.98796405666675	20'	Hector 0.0
55'	time	143.94343386666665	48'	1' 94.35280424999999
55'	2'	143.94343386666665	1'	York 0.0
2'	God	0.0	1'	eye 0.0
2'	Caesar	0.0	66'	63' 76.80581210005141
62'	57'	79.98565935666673	63'	56' 92.71244894554943
57'	lord	149.94573856666668	56'	great 148.28860998945058
57'	48'	55.59293431 6666685	56'	54' 21.17865196042 493
			54'	50' 28.093347582025658
			50'	45' 26.501868021999996
			45'	15' 72.514742425
			15'	death 0.0
			15'	Othello 0.0
			45'	38' 39.274311035
			38'	32' 20.699987369999995
			32'	poor 12.54044402
			32'	13' 12.54044402
			13'	Bolingbroke 0.0
			13'	Messenger 0.0
			38'	Exit 33.24043139
			50'	33' 85.496175177
			33'	24' 13.52043527
			24'	sweet 0.0
			24'	Servant 0.0

INTRATEXTUALITY -- Kent Palmer

33' 25' 13.52043527	3' world 0.0	28' Speak 3.351616526666667
25' Warwick 0.0	3' Buckingham 0.0	35' Edward 22.012583013333334
25' Antonio 0.0	69' 67' 95.74216376017262	42' 30' 44.852664196666667
54' 39' 92.51172269235897	67' 4' 373.74363421010423	30' heaven 10.792477066666669
39' night 34.598235336666667	4' King 0.0	30' 7' 10.792477066666669
39' 11' 34.598235336666667	4' Antony 0.0	7' Prince 0.0
11' England 0.0	67' 65' 82.8209985574606	7' Suffolk 0.0
11' Rome 0.0	65' man 290.92263565264363	64' 59' 79.19929555304009
63' 61' 34.91511209492856	65' 64' 49.42690176272316	59' 51' 61.8715414392415
61' 60' 37.4470093065714	64' 58' 89.88927808825383	51' heart 100.42489689763889
60' 52' 54.02794150350002	58' 53' 32.34394533583331	51' 43' 36.00283667172222
52' 44' 46.59356553000002	53' 14' 119.26251046583333	43' 41' 8.99417875058333
44' 22' 68.0174305	14' men 0.0	41' 27' 52.07626494866667
22' father 0.0	14' Cleopatra 0.0	27' 6' 3.351616526666667
22' Timon 0.0	53' 37' 89.90766933833333	6' Gloucester 0.0
44' 12' 68.0174305	37' 19' 29.354841127500002	6' Hamlet 0.0
12' Queen 0.0	19' hand 0.0	27' English 3.351616526666667
12' French 0.0	19' Lear 0.0	41' 16' 55.427881475333336
52' 31' 102.93234612000002	37' 8' 29.354841127500002	16' son 0.0
31' Exeunt 11.67864991	8' King_henry 0.0	16' Iago 0.0
31' head 11.67864991	8' King_richard 0.0	43' 29' 58.38605713258333
60' 49' 72.36059982600004	58' 47' 64.48081162999998	29' 26' 6.036003093333334
49' 18' 96.2783377075	47' 34' 67.29661077833333	26' fear 0.0
18' day 0.0	34' 23' 19.829033393333333	26' Prospero 0.0
18' Kent 0.0	23' fair 0.0	29' Richard 6.036003093333334
49' 5' 96.2783377075	23' Macbeth 0.0	59' 40' 118.60506214188038
5' life 0.0	34' Duke 19.829033393333333	40' 21' 43.691376195
5' Henry 0.0	47' 42' 31.48050290833332	21' eyes 0.0
61' 46' 128.17368783257143	42' 35' 33.63255825000001	21' Clown 0.0
46' 9' 77.9122590075	35' 28' 18.660966486666666	40' 10' 43.691376195
9' blood 0.0	28' 17' 3.351616526666667	10' France 0.0
9' Falstaff 0.0	17' long 0.0	10' Brutus 0.0
46' 3' 77.9122590075	17' Troilus 0.0	

Cluster V0.1

Using Saitou and Nei Neighbour Joining

There are 70 samples.

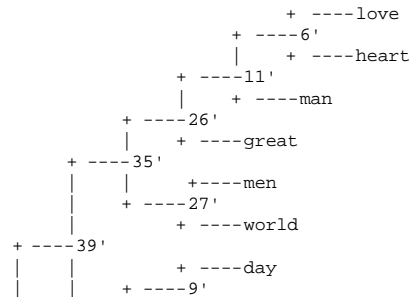
Neighbour-Joining procedure: Square Similarity Matrix

Step	A	Length	B	Length	
1	time	-2283.5620927744117	long	-2141.266305225588	4 Othello -605.9807462948077 Iago -604.3881267051922
2	Caesar	-860.1962694917911	Antony	-834.558554508209	5 King -996.8094719252344 Queen -681.2798110747656
3	Prince	-754.6427161619697	Falstaff	-717.9278478380304	6 love -913.6599684028571 heart -687.7386085971428
					7 2' 425.3281185184073 Cleopatra -383.3638639684072
					8 lord -625.3317199858402 Hamlet -377.46426701415976

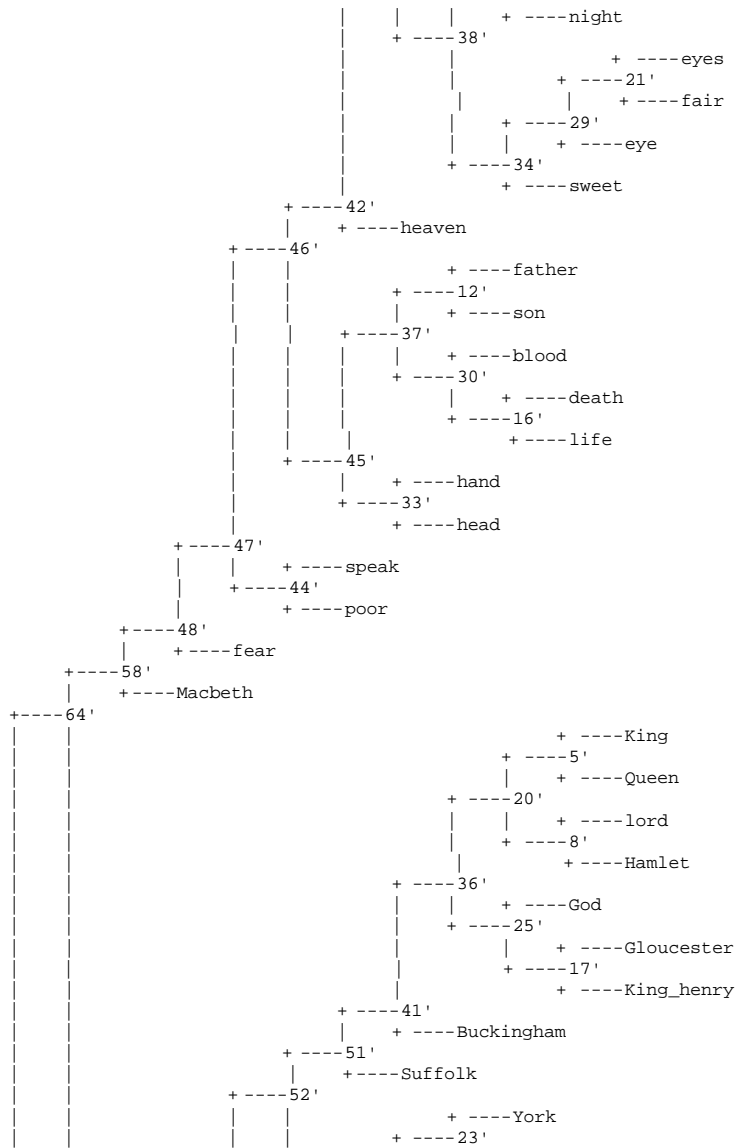
INTRATEXTUALITY -- Kent Palmer

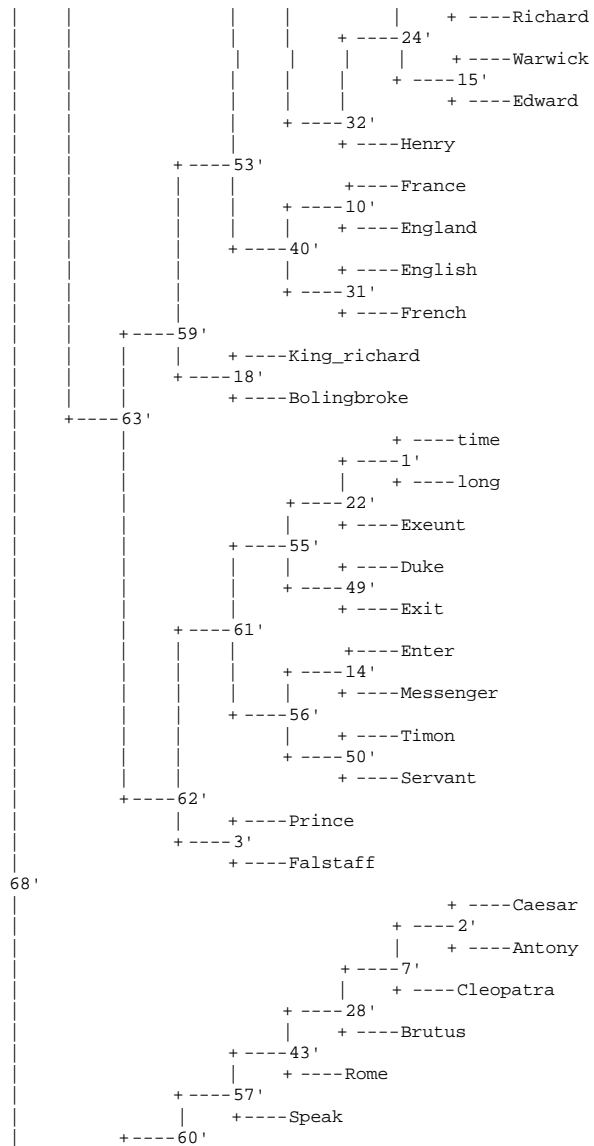
9 day -523.3624470090833 night -470.0201290909167
 10 France -459.97600052722447 England -431.2230222727755
 11 6' 175.05730861624988 man -672.0272172662499
 12 father -513.1752664642981 son -438.5640126357018
 13 Kent -303.0025652796652 Lear -298.27182872033484
 14 Enter -405.1146504536818 Messenger -304.1487894463182
 15 Warwick -369.81062586164353 Edward -321.33445253835646
 16 death -422.05110855117925 life -423.80799814882073
 17 Gloucester -367.24854821581727 King_henry -
 348.44419728418274
 18 King_richard -265.74264090747545 Bolingbroke -
 260.8905267925245
 19 Troilus -223.28704025075 Hector -219.54350204924998
 20 5' 364.61243291193875 8' 139.2069341880612
 21 eyes -388.1581041498959 fair -372.60722525010414
 22 1' 1840.6989969825133 Exeunt -315.9283211825134
 23 York -300.42742652834244 Richard -244.8166901716575
 24 23' 12.128123870888857 15' 88.15537020411111
 25 God -376.33986797529826 17' 75.95115167529832
 26 11' 137.0839750993606 great -375.23158652436064
 27 men -398.1210570221129 world -313.8206664778871
 28 7' 238.61948241144052 Brutus -172.60917381144054
 29 21' 80.3676615819609 eye -223.62687523196084
 30 blood -323.0502459645835 16' 124.07735501458342
 31 English -157.62597112536181 French -153.78919307463818
 32 24' 73.400231953864 Henry -157.042290866364
 33 hand -264.0980711886285 head -223.4817548113715
 34 29' 31.379318412236586 sweet -226.13339401223658
 35 26' 83.78036245397071 27' 82.1563743397793
 36 20' 140.24086949856053 25' 90.63174190143945
 37 12' 261.43383382291506 30' 77.18915856458494
 38 9' 285.0392550838255 34' 58.178005103674536
 39 35' 56.7679144556173 16 38' 8.994599768601422
 40 10' 279.2836747116111 31' 52.9617841133889
 41 36' 39.55975553661061 Buckingham -111.85500352411059
 42 39' 14.912047152948048 heaven -141.79841590099494
 43 28' 78.49523255317048 Rome -95.63948101317047
 44 speak -170.74992657431878 poor -142.2532905256812
 45 37' 51.235399505362054 33' 95.493203188388
 46 42' 30.108671314502505 45' 11.365770440751387
 47 46' 4.955741708806229 44' 22.86809250301993
 48 47' 17.13564075479833 fear -109.08798973702488
 49 Duke -118.77444322992173 Exit -147.9401461700783
 50 Timon -52.708188338705355 Servant -58.680274461294644
 51 41' 38.77651210839798 Suffolk -70.02762246339799
 52 51' 6.970852550478725 32' 95.27741661905254
 53 52' 13.031228987507546 40' 64.77915661198463
 54 Antonio -42.26652350647662 Prospero -33.34803450352338
 55 22' 206.03930931158726 49' 22.307706425912713
 56 14' 271.774584821231 50' 19.279547518768993
 57 43' 50.11145705412488 Speak -48.37229920037487
 58 48' 48.90493882269595 Macbeth -13.518610093008455
 59 53' 33.64263786288717 18' 240.4169 8559619488
 60 57' 25.084948943389065 13' 291.8238784403609
 61 55' 34.03193651329178 56' 30.062001987645715
 62 61' 2.790217024665594 3' 713.5618451892407
 63 59' 13.700089381141671 62' 5.702252634854384
 64 58' 13.644328126497783 63' 3.050196150296017
 65 60' 10.750642134186009 54' 39.597849004095266
 66 65' 0.9041813744261162 4' 604.0389076689332
 67 19' 219.51839135421966 Clown -4.525215594219674
 68 64' 6.193669550528 67' 0.8601960287484474
 69 68' 1.8019638641030014 66' 1.8019638641030014

Tree Topology (edge lengths ignored)

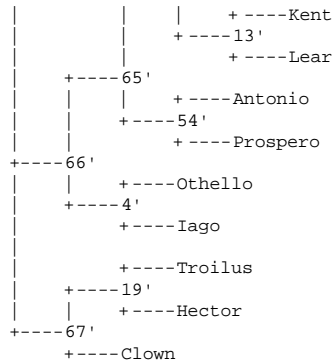


INTRATEXTUALITY -- Kent Palmer





INTRATEXTUALITY -- Kent Palmer



From	To	Length
68'	64'	6.193669550528
64'	58'	13.644328126497783
58'	48'	48.90493882269595
48'	47'	17.13564075 479833
47'	46'	4.955741708806229
46'	42'	30.108671314502505
42'	39'	14.912047152948048
39'	35'	56.767914455617316
35'	26'	83.78036245397071
26'	11'	137.0839750993606
11'	6'	175.05730861624988
6'	love	-913.6599684028571
6'	heart	-687.7386085971428
11'	man	-672.0272172662499
26'	great	-375.23158652436064
35'	27'	82.1563743397793
27'	men	-398.1210570221129
27'	world	-313.8206664778871
39'	38'	8.994599768601422
38'	9'	285.0392550838255
9'	day	-523.3624470090833
9'	night	-470.0201290909167
38'	34'	58.17800510367 4536
34'	29'	31.379318412236586
29'	21'	80.3676615819609
21'	eyes	-388.1581041498959
21'	fair	-372.60722525010414
29'	eye	-223.62687523196084
34'	sweet	-226.13339401223658

42'	heaven	-141.79841590099494
46'	45'	11.365770440751387
45'	37'	51.235399505362054
37'	12'	261.43383382291506
12'	father	-513.1752664642981
12'	son	-438.5640126357018
37'	30'	77.18915856458494
30'	blood	-323.0502459645835
30'	16'	124.07735501458342
16'	death	-422.05110855117925
16'	life	-423.80799814882073
45'	33'	95.493203188388
33'	hand	-264.0980711886285
33'	head	-223.4817548113715
47'	44'	22.86809250301993
44'	speak	-170.74992657431878
44'	poor	-142.2532905256812
48'	fear	-109.08798973702488
58'	Macbeth	-13.518610093008455
64'	63'	3.050196150296017
63'	59'	13.700089381141671
59'	53'	33.64263786288717
53'	52'	13.031228987507546
52'	51'	6.970852550478725
51'	41'	38.77651210839798
41'	36'	39.55975553661061
36'	20'	140.24086949856053
20'	5'	364.61243291193875
5'	King	-996.8094719252344
5'	Queen	-681.2798110747656
20'	8'	139.2069341880612

8'	lord	-625.3317199858402
8'	Hamlet	-377.46426701415976
36'	25'	90.63174190143945
25'	God	-376.33986797529826
25'	17'	75.95115167529832
17'	Gloucester	-367.24854821581727
17'	King_henry	-348.44419728418274
41'	Buckingham	-111.85500352411059
51'	Suffolk	-70.02762246339799
52'	32'	95.27741661905254
32'	24'	73.400231953864
24'	23'	12.128123870888857
23'	York	-300.42742652834244
23'	Richard	-244.8166901716575
24'	15'	88.15537020411111
15'	Warwick	-369.81062586164353
15'	Edward	-321.33445253835646
32'	Henry	-157.042290866364
53'	40'	64.77915661198463
40'	10'	279.2836747116111
10'	France	-459.97600052722447
10'	England	-431.2230222727755
40'	31'	52.9617841133889
31'	English	-157.62597112536181
31'	French	-153.78919307463818
59'	18'	240.41698559619488
18'	King_richard	-265.74264090747545
18'	Bolingbroke	-260.8905267925245
63'	62'	5.702252634854384
62'	61'	2.790217024665594
61'	55'	34.03193651329178

INTRATEXTUALITY -- Kent Palmer

55' 22' 206.03930931158726	3' Prince -754.6427161619697	60' 13' 291.8238784403609
22' 1' 1840.6989969825133	3' Falstaff -717.9278478380304	13' Kent -303.0025652796652
1' time -2283.5620927744117	68' 66' 1.8019638641030014	13' Lear -298.27182872033484
1' long -2141.266305225588	66' 65' 0.9041813744261162	65' 54' 39.597849004095266
22' Exeunt -315.9283211825134	65' 60' 10.750642134186009	54' Antonio -42.26652350647662
55' 49' 22.307706425912713	60' 57' 25.084948943389065	54' Prospero -33.34803450352338
49' Duke -118.77444322992173	57' 43' 50.11145705412488	66' 4' 604.0389076689332
49' Exit -147.9401461700783	43' 28' 78.49523255317048	4' Othello -605.9807462948077
61' 56' 30.062001987645715	28' 7' 238.61948241144052	4' Iago -604.3881267051922
56' 14' 271.774584821231	7' 2' 425.3281185184073	68' 67' 0.8601960287484474
14' Enter -405.1146504536818	2' Caesar -860.1962694917911	67' 19' 219.51839135421966
14' Messenger -304.1487894463182	2' Antony -834.558554508209	19' Troilus -223.28704025075
56' 50' 19.279547518768993	7' Cleopatra -383.3638639684072	19' Hector -219.54350204924998
50' Timon -52.708188338705355	28' Brutus -172.60917381144054	67' Clown -4.525215594219674
50' Servant -58.680274461294644	43' Rome -95.63948101317047	
62' 3' 713.5618451892407	57' Speak -48.37229920037487	

Cluster V0.1

Using Saitou and Nei Neighbour Joining

There are 70 samples.

Neighbour-Joining procedure: Square Distance Matrix

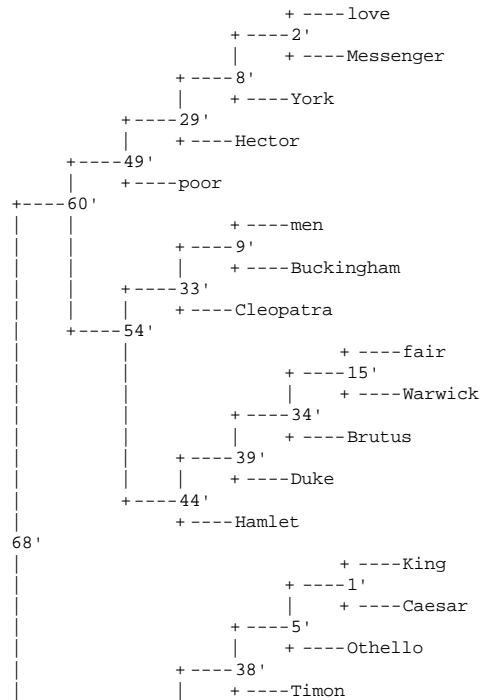
Step	A	Length	B	Length
=====				
1	King	193.3412450215442	Caesar	-178.60862814154422
2	love	233.4224399693656	Messenger	-201.9876258593656
3	man	176.25200905136347	Edward	-130.99702636136348
4	time	128.06189962784612	King_henry	-55.8809995978461
5	1'	118.60466728873054	Othello	-125.97097572873054
6	blood	65.1499992328176	Exeunt	-9.211762182817608
7	lord	147.71339078675408	Clown	-136.76578830675408
8	2'	92.7444157162397	York	-10.33434952123968
9	men	102.3172825219166	Buckingham	-74.4533880219166
10	father	85.47998072311445	Antony	-85.47998072311445
11	heart	96.39340547974132	Enter	-11.912952789741318
12	life	61.99133542445171	Henry	-61.99133542445171
13	long	26.581141602120535	Gloucester	12.567425947879467
14	God	98.25701875799994	Troilus	-98.25701875799994
15	fair	59.15864536981482	Warwick	-7.616257109814814
16	day	93.9068763800236	Kent	-93.9068763800236
17	sweet	21.99493762329321	England	9.124008576706789
18	eyes	78.8309921990687	Falsta ff	-47.12821249906871
19	night	44.31402494005005	France	32.073827479949955
20	Queen	31.053476948188866	heaven	13.804938431811133
21	3'	103.4785232990103	Prospero	-103.02906927401031
22	4'	65.46774942938832	Servant	-91.34116094438832
23	death	79.7624593155707	Iago	-79.7624593155707
24	head	26.15964153624988	Exit	1.5897613737501235
25	6'	46.03348270001431	eye	-2.7537341750143085
26	great	115.38647523130814	English	-52.71515061130815
27	world	54.97682273928583	French	-54.97682273928583
28	hand	73.0760463449084	6 King_richard	-29.978649324908453
29	8'	45.74282215103119	Hector	-73.6690952060312
30	19'	16.118606281306114	speak	62.48695805869389
31	18'	19.429834064284584	13'	28.47721427571542
32	7'	72.58397965516895	Richard	-20.625368945168944
33	9'	45.4060515802082	6 Cleopatra	-59.337998830208264
34	15'	23.61199824767856	Brutus	-40.03172190267856
35	20'	27.38583162362135	Prince	-10.457747068621345
36	10'	61.41769774179926	Bolingbroke	-31.11999216799258
37	17'	26.1313659467383	Rome	-33.9594096817383
38	5'	67.76604926734387	Timon	-67.76604926734387
39	34'	8.559043442406193	Duke	23.924564227593812
40	11'	49.53793762636844	Speak	-46.79694262636844
41	son	55.90607920241081	fear	42.28402894758919
42	31'	18.914479197864573	Macbeth	-58.07646900286458

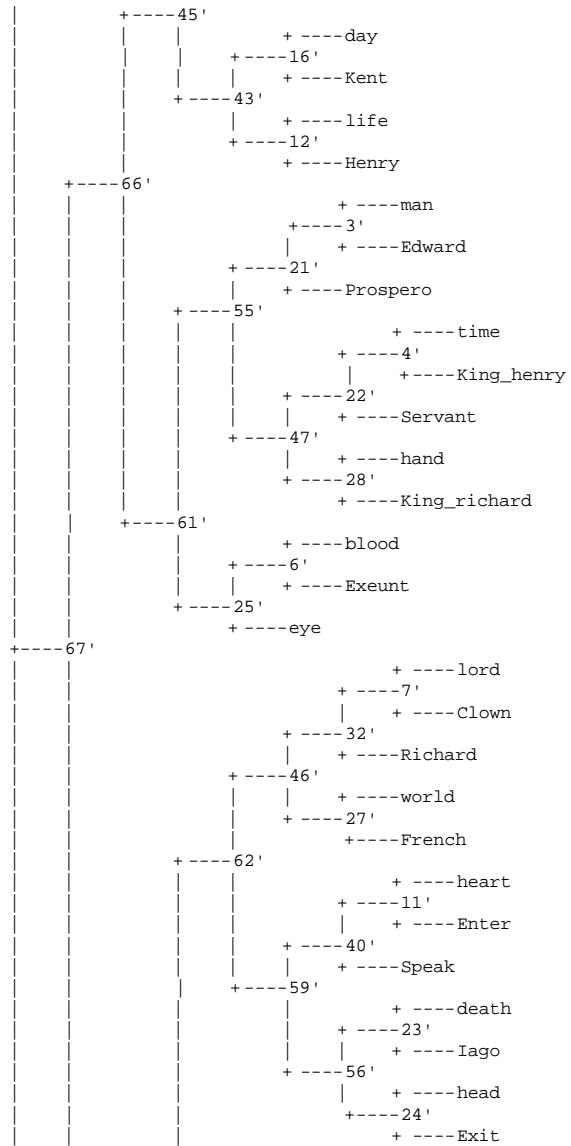
INTRATEXTUALITY -- Kent Palmer

43 16' 43.90731855930292 12' 52.37101914819708
 44 39' 11.835220412150033 Hamlet -18.494555432150037
 45 38' 14.811336692255932 43' 7.6887149714940755
 46 32' 16.859203360954268 27' 32.31097199404574
 47 22' 32.23368963739709 28' 27.68558740635292
 48 30' 27.227032144296892 35' 18.617 259761328107
 49 29' 30.079125838388606 poor 51.31951683036138
 50 41' 14.378988636759914 Lear -47.86156646675991
 51 14' 54.182810235251694 50' 1.8206147147483023
 52 26' 36.39738674491737 Suffolk -13.225030304917363
 53 36' 20.07981634752687 42' 13.2522913402 85634
 54 33' 27.46217982566133 44' 15.633700396682428
 55 21' 47.62006998028859 47' 10.027447998461401
 56 23' 42.7130599883656 24' 40.658677094134404

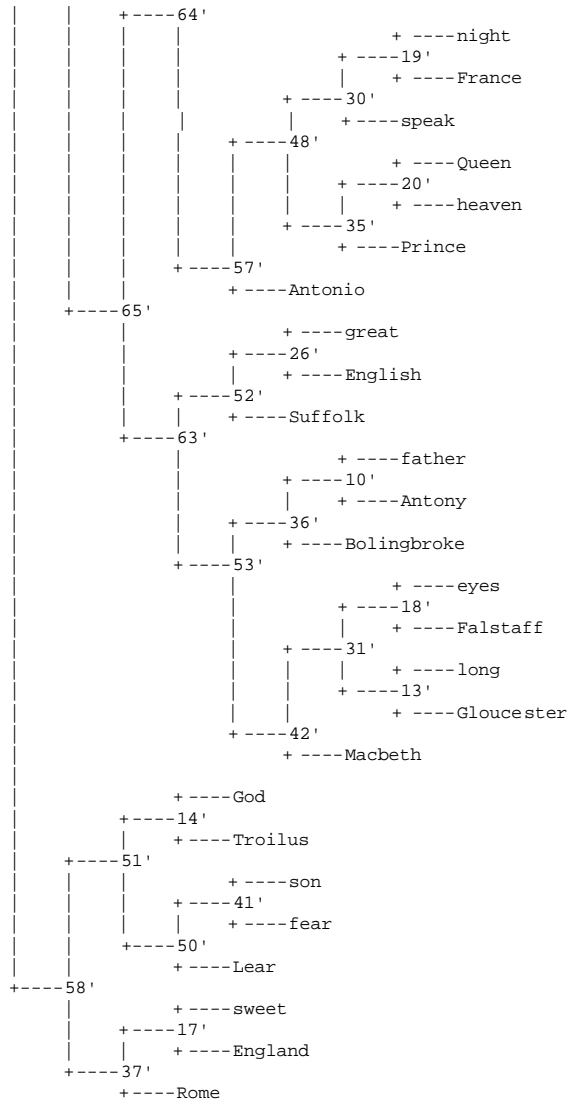
57 48' 9.027953522417064 Antonio -47.21080599522956
 58 51' 9.263268098599006 37' 28.98168309015101
 59 40' 24.834387974371012 56' 6.306776059378992
 60 49' 13.727899720786828 54' 9.792675313822555
 61 55' 7.2262561438858555 25' 44.58797995205165
 62 46' 16.1555515469826 59' 5.500803224892393
 63 52' 14.939405876284166 53' 10.652659174809578
 64 62' 4.724292721911986 57' 10.484174660861452
 65 64' 2.413627342149666 63' 5.979719104569088
 66 45' 17.49967610214888 61' 6.764333565077682
 67 66' 1.8610211900226243 65' 3.545520472655598
 68 67' 1.6762379870907171 58' 10.495812603791846
 69 68' 5.724603312877807 60' 5.72460331287 7807

Tree Topology (edge lengths ignored)





INTRATEXTUALITY -- Kent Palmer



From To Length

=====

68' 60' 5.724603312877807

INTRATEXTUALITY -- Kent Palmer

60' 49' 13.727899720786828
49' 29' 30.079125838388606
29' 8' 45.74282215103119
8' 2' 92.7444157162397
2' love 233.4224399693656
2' Messenger -201.9876258593656
8' York -10.33434952123968
29' Hector -73.6690952060312
49' poor 51.31951683036138
60' 54' 9.792675313822555
54' 33' 27.46217982566133
33' 9' 45.40605158020826
9' men 102.3172825219166
9' Buckingham -74.4533880219166
33' Cleopatra -59.337998830208264
54' 44' 15.633700396682428
44' 39' 11.835220412150033
39' 34' 8.559043442406193
34' 15' 23.61199824767856
15' fair 59.15864536981482
15' Warwick -7.616257109814814
34' Brutus -40.03172190267856
39' Duke 23.924564227593812
44' Hamlet -18.494555432150037
68' 67' 1.6762379870907171
67' 66' 1.8610211900226243
66' 45' 17.49967610214888
45' 38' 14.811336692255932
38' 5' 67.76604926734387
5' 1' 118.60466728873054
1' King 193.3412450215442
1' Caesar -178.60862814154422
5' Othello -125.97097572873054
38' Timon -67.76604926734387
45' 43' 7.6887149714940755
43' 16' 43.90731855930292
16' day 93.9068763800236
16' Kent -93.9068763800236
43' 12' 52.37101914819708
12' life 61.99133542445171
12' Henry -61.99133542445171
66' 61' 6.764333565077682
61' 55' 7.2262561438858555
55' 21' 47.62006998028859
21' 3' 103.4785232990103
3' man 176.25200905136347
3' Edward -130.99702636136348
21' Prospero -103.02906927401031
55' 47' 10.027447998461401
47' 22' 32.23368963739709
22' 4' 65.46774942938832
4' time 128.06189962784612
4' King_henry -55.8809995978461
22' Servant -91.34116094438832
47' 28' 27.68558740635292
28' hand 73.07604634490846
28' King_richard -29.978649324908453
61' 25' 44.58797995205165
25' 6' 46.03348270001431
6' blood 65.1499992328176
6' Exeunt -9.211762182817608
25' eye -2.7537341750143085
67' 65' 3.545520472655598
65' 64' 2.413627342149666
64' 62' 4.724292721911986
62' 46' 16.1555515469826
46' 32' 16.859203360954268
32' 7' 72.58397965516895
7' lord 147.71339078675408
7' Clown -136.76578830675408
32' Richard -20.625368945168944
46' 27' 32.310971999404574
27' world 54.97682273928583
27' French -54.97682273928583
62' 59' 5.500803224892393
59' 40' 24.834387974371012
40' 11' 49.53793762636844
11' heart 96.39340547974132
11' Enter -11.912952789741318
40' Speak -46.79694262636844
59' 56' 6.306776059378992
56' 23' 42.7130599883656
23' death 79.7624593155707
23' Iago -79.7624593155707
56' 24' 40.658677094134404
24' head 26.15964153624988
24' Exit 1.5897613737501235
64' 57' 10.484174660861452
57' 48' 9.027953522417064
48' 30' 27.227032144296892
30' 19' 16.118606281306114
19' night 44.31402494005005
19' France 32.073827479949955
30' speak 62.48695805869389
48' 35' 18.617259761328107
35' 20' 27.38583162362135
20' Queen 31.053476948188866
20' Heaven 13.804938431811133
35' Prince -10.457747068621345
57' Antonio -47.21080599522956
65' 63' 5.979719104569088
63' 52' 14.939405876284166
52' 26' 36.39738674491737
26' great 115.38647523130814
26' English -52.7151061130815
52' Suffolk -13.225030304917363
63' 53' 10.652659174809578
53' 36' 20.07981634752687
36' 10' 61.41769774179926
10' father 85.47998072311445
10' Antony -85.47998072311445
36' Bolingbroke -31.119999216799258
53' 42' 13.252291340285634
42' 31' 18.914479197864573
31' 18' 19.429834064284584
18' eyes 78.8309921990687
18' Falstaff -47.12821249906871
31' 13' 28.47721427571542
13' long 26.581141602120535
13' Gloucester 12.567425947879467
42' Macbeth -58.07646900286458
68' 58' 10.495812603791846
58' 51' 9.263268098599006
51' 14' 54.182810235251694
14' God 98.25701875799994
14' Troilus -98.25701875799994
51' 50' 1.8206147147483023
50' 41' 14.378988636759914
41' son 55.90607920241081
41' fear 42.28402894758919
50' Lear -47.86156646675991
58' 37' 28.98168309015101
37' 17' 26.1313659467383
17' sweet 21.99493762329321
17' England 9.124008576706789
37' Rome -33.9594096817383

