

CCOD

Kolesnikov Dmitriy

Lab 11(November 04)

Clusterisation of Greek alphabet

Similarity table:

	A	B	Θ	E	Ξ	H	I	Δ	K	Γ	M	N	O	P	Ω	Φ	Σ	T	Π	Λ	Ψ	X	Y	Z	
A	1	0.2	0.1	0.2	0.2	0.3	0.1	0.1	0.2	0.1	0.7	0.8	0.1	0.1	0.1	0.4	0.2	0.3	0.1	0.4	0.3	0.65	0.65	0.3	A
B	0.2	1	0.85	0.7	0.6	0.3	0.1	0.1	0.55	0.1	0.1	0.1	0.4	0.7	0.1	0.85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.55	B
Θ	0.1	0.85	1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.65	0.75	0.3	0.55	0.1	0.35	0.1	0.1	0.1	0.1	0.1	Θ
E	0.2	0.7	0.4	1	0.9	0.1	0.2	0.2	0.52	0.48	0.1	0.1	0.1	0.1	0.1	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	E
Ξ	0.2	0.6	0.3	0.9	1	0.1	0.1	0.1	0.55	0.4	0.1	0.1	0.1	0.1	0.1	0.95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.55	Ξ
H	0.3	0.3	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	H
I	0.1	0.1	0.1	0.2	0.1	0.1	1	0.9	0.1	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.1	0.1	0.1	0.1	0.1	I
Δ	0.1	0.1	0.1	0.2	0.1	0.1	0.9	1	0.1	0.75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.75	0.1	0.1	0.1	0.1	0.1	0.1	Δ
K	0.2	0.55	0.1	0.52	0.55	0.1	0.1	0.1	1	0.1	0.3	0.2	0.1	0.1	0.1	0.8	0.1	0.1	0.1	0.1	0.1	0.6	0.55	0.56	K
Γ	0.1	0.1	0.1	0.48	0.4	0.1	0.9	0.75	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.1	0.1	0.1	0.1	0.1	0.1	Γ
M	0.7	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.3	0.1	1	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.45	0.49	0.6	0.55	0.1	M
N	0.8	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.2	0.1	0.8	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.45	0.55	0.55	0.1	N
O	0.1	0.4	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.55	0.95	0.1	0.55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	O
P	0.1	0.7	0.65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.55	1	0.55	0.9	0.55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	P
Ω	0.1	0.1	0.75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.95	0.55	1	0.1	0.51	0.1	0.1	0.2	0.1	0.1	0.1	0.1	Ω
Φ	0.4	0.85	0.3	0.9	0.95	0.1	0.1	0.1	0.8	0.1	0.1	0.1	0.9	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.55	Φ
Σ	0.2	0.1	0.55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.55	0.55	0.51	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Σ
T	0.3	0.1	0.1	0.1	0.1	0.2	0.8	0.75	0.1	0.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	T
Π	0.1	0.1	0.35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.9	0.7	0.1	0.45	0.1	Π
Λ	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.45	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.9	1	0.85	0.45	0.49	0.1	Λ
Ψ	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.49	0.45	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.85	1	0.4	0.4	0.1	Ψ
X	0.65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.6	0.55	0.1	0.1	0.1	0.1	0.1	0.1	0.45	0.4	1	0.6	0.1	0.1	X
Y	0.65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.55	0.1	0.55	0.55	0.1	0.1	0.1	0.1	0.1	0.1	0.45	0.49	0.4	0.6	1	0.1	Y
Z	0.3	0.55	0.1	0.6	0.55	0.1	0.1	0.1	0.56	0.1	0.1	0.1	0.1	0.1	0.1	0.55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	Z

Final table:

	A	B	Θ	E	Ξ	H	I	Δ	K	Γ	M	N	O	P	Ω	Φ	Σ	T	Π	Λ	Ψ	X	Y	Z
A	0	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0.8	0.8	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0.65	0.65	0.6
B	0.6	0	0.85	0.85	0.85	0	0	0	0.8	0	0.6	0.6	0.8	0.85	0.8	0.85	0.6	0	0	0	0	0.6	0.6	0.6
Θ	0.6	0.85	0	0.85	0.85	0	0	0	0.8	0	0.6	0.6	0.8	0.85	0.8	0.85	0.6	0	0	0	0	0.6	0.6	0.6
E	0.6	0.85	0.85	0	0.9	0	0	0	0.8	0	0.6	0.6	0.8	0.9	0.8	0.9	0.6	0	0	0	0	0.6	0.6	0.6
Ξ	0.6	0.85	0.85	0.9	0	0	0	0	0.8	0	0.6	0.6	0.8	0.9	0.8	0.95	0.6	0	0	0	0	0.6	0.6	0.6
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0.9	0	0.9	0	0	0	0	0	0	0	0.8	0	0	0	0	0	0
Δ	0	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	0	0	0.8	0	0	0	0	0	0
K	0.6	0.8	0.8	0.8	0.8	0	0	0	0	0	0.6	0.6	0.8	0.8	0.8	0.8	0.6	0	0	0	0	0.6	0.6	0.6
Γ	0	0	0	0	0	0	0.9	0.9	0	0	0	0	0	0	0	0	0	0.8	0	0	0	0	0	0
M	0.8	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0	0.8	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0.65	0.65	0.6
N	0.8	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0.8	0	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0.65	0.65	0.6
O	0.6	0.8	0.8	0.8	0.8	0	0	0	0.8	0	0.6	0.6	0	0.8	0.95	0.8	0.6	0	0	0	0	0.6	0.6	0.6
P	0.6	0.85	0.85	0.9	0.9	0	0	0	0.8	0	0.6	0.6	0.8	0	0.8	0.9	0.6	0	0	0	0	0.6	0.6	0.6
Ω	0.6	0.8	0.8	0.8	0.8	0	0	0	0.8	0	0.6	0.6	0.95	0.8	0	0.8	0.6	0	0	0	0	0.6	0.6	0.6
Φ	0.6	0.85	0.85	0.9	0.95	0	0	0	0.8	0	0.6	0.6	0.8	0.9	0.8	0	0.6	0	0	0	0	0.6	0.6	0.6
Σ	0.6	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0.6	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0	0.6	0.6	0.6
T	0	0	0	0	0	0	0.8	0.8	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Π	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0.85	0	0	0
Λ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0.85	0	0	0
Ψ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.85	0.85	0	0	0	0
X	0.65	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0.65	0.65	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0	0.65	0.6
Y	0.65	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0.65	0.65	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0.65	0	0.6
Z	0.6	0.6	0.6	0.6	0.6	0	0	0	0.6	0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0	0	0	0	0.6	0.6	0

$$I = \{A, B, \Theta, E, \Xi, H, I, \Delta, K, \Gamma, M, N, O, P, \Omega, \Phi, \Sigma, T, \Pi, \Lambda, \Psi, X, Y, Z\}$$

$$C_1 = \{\}$$

$$a_{OQ} = a_{QO} = 0.95$$

$$C_1 = \{O, \Omega\}$$

$$Max\ sum = O = 0.9 * 2 = 1.8 \Rightarrow C_1 = \{O, \Omega\}$$

Cluster №1 is created . Go in to the next step.

$$I = \{A, B, \Theta, E, \Xi, H, I, \Delta, K, \Gamma, M, N, P, \Phi, \Sigma, T, \Pi, \Lambda, \Psi, X, Y, Z\}$$

$$C_2 = \{\}$$

$$a_{UV} = a_{VU} = 0.9$$

$$C_2 = \{\Pi, \Lambda\}$$

$$Max\ sum = \Psi = 0.85 * 2 = 1.7 \Rightarrow C_2 = \{\Pi, \Lambda, \Psi\}$$

Cluster №2 is created . Go in to the next step.

$$I = \{A, B, \Theta, E, \Xi, H, I, \Delta, K, \Gamma, M, N, P, \Phi, \Sigma, T, X, Y, Z\}$$

$$C_3 = \{\}$$

$$a_{FR} = a_{RF} = 0.95$$

$$C_3 = \{\Xi, \Phi\}$$

$$Max\ sum = E, P = 0.9 * 2 = 1.8 \Rightarrow C_3 = \{E, \Xi, P, \Phi\}$$

Cluster №3 is created . Go in to the next step.

$$I = \{A, B, \Theta, H, I, \Delta, K, \Gamma, M, N, \Sigma, T, X, Y, Z\}$$

$$C_4 = \{\}$$

$$a_{BD} = a_{DB} = 0.85$$

$$C_4 = \{B, \Theta\}$$

$$Max\ sum = K = 0.8 * 2 = 1.6 \Rightarrow C_4 = \{B, \Theta, K\}$$

Cluster №4 is created . Go in to the next step.

$$I = \{A, H, I, \Delta, \Gamma, M, N, \Sigma, T, X, Y, Z\}$$

$$C_5 = \{\}$$

$$a_{MN} = a_{NM} = 0.8$$

$$C_5 = \{M, N\}$$

$$Max\ sum = A = 0.8 * 2 = 1.6 \Rightarrow C_5 = \{A, M, N\}$$

Cluster №5 is created . Go in to the next step.

$$I = \{H, I, A, \Gamma, \Sigma, T, X, Y, Z\}$$

$$C_6 = \{\}$$

$$a_{IJ} = a_{JI} = 0.9$$

$$C_6 = \{I, A\}$$

$$Max\ sum = \Gamma = 0.9 * 2 = 1.8 \Rightarrow C_6 = \{I, A, \Gamma\}$$

Cluster №6 is created . Go in to the next step.

$$I = \{H, \Sigma, T, X, Y, Z\}$$

$$C_7 = \{\}$$

$$a_{XY} = a_{YX} = 0.65$$

$$C_7 = \{X, Y\}$$

$$Max\ sum = \Sigma, Z = 0.6 * 2 = 1.2 \Rightarrow C_7 = \{\Sigma, X, Y, Z\}$$

Cluster №7 is created . Go in to the next step.

Only zeros remain , so we divide other letters in separate clusters.

$$C_8 = \{H\}$$

$$C_9 = \{T\}$$

Final Cluster:

$$C = \{\{O, \Omega\}, \{\Pi, \Lambda, \Psi\}, \{E, \Xi, P, \Phi\}, \{B, \Theta, K\}, \{A, M, N\}, \{I, \Delta, \Gamma\}, \{\Sigma, X, Y, Z\}, \{H\}, \{T\}\}$$