

# Phylogenetic inference from word lists using weighted alignment with empirically determined weights

## — *Online Supporting Material* —

### 1. Training set and test set

(The numbers in parantheses give the number of word lists per family.)

- **Language families in the training set (total of 2,723 word lists):**  
Niger-Congo (890), Trans-New Guinea (324), Afro-Asiatic (319), Nilo-Saharan (162), Austro-Asiatic (123), Tai-Kadai (112), Oto-Manguean (83), Tupi (48), Quechua (46), Toricelli (45), Hmong-Mien (35), Dravidian (34), Nakh-Daghestanian (32), West Papuan (31), Lakes Plain (27), Uralic (27), Algonquian (24), Macro-Ge (23), Marind (20), Na-Dene (19), Penutian (17), Mixe-Zoque (15), Morehead and Upper Maro Rivers (15), Bosavi (14), Totanocan (14), Warupu (14), Siouan (12), Border (9), Burushaski (9), Aymaran (8), Great Andamanese (8), Iroquoian (7), Kwerba (7), Nimboran (7), Tor-Orya (7), Guahiban (6), Yawa (6), Bulaka (5), Tacanan (5), Arafundi (4), Kiowa-Tanaoan (4), Kolopom (4), Northwest-Caucasian (4), Tarascan (4), Vaupes-Japura (4), Wakashan (4), Zaparoan (4), East-Bougainville (3), East-Geelvink-Bay (3), Katukinan (3), Mairasi (3), Upper Yuat (3), Zamucon (3), Amto-Musan (2), Gapuni (2), Laal (2), Lencan (2), Lule-Vilela (2), Monumbo (2), Murkim (2), Nahali (2), Paez (2), Tequistlatecan (2), Yukaghir (2), Yuwana (2), Alacalufan (1), Andoke (1), Anem (1), Arutani (1), Awin-Pare (1), Cayuvava (1), Cofan (1), Cuitlatec (1), Doso (1), Hadza (1), Haida (1), Harakmbet (1), Irantxe (1), Itonama (1), Kamsa (1), Kamula (1), Karok (1), Kenaboi (1), Kuot (1), Kwaza (1), Lepki (1), Lower Mamberano (1), Morwap (1), Moseetan (1), Natchez (1), Oksapmin (1), Pataxo (1), Sape (1), Savosavo (1), Taushiro (1), Ticuna (1), Tofanma (1), Tol (1), Touo (1), Warao (1), Washo (1), Xincan (1), Yamana (1), Yeniseian (1), Yuchi (1)
- **Language families in the test set (total of 2,758 word list):**  
Austronesian (1,154), Indo-European (292), Sino-Tibetan (211), Australian (194), Mayan (107), Altaic (87), Uto-Atztecan (65), Arawakan (55), Western-Fly (38), Tucoanoan (32), Sepik (29), Cariban (28), Khoisan (27), Salish (24), Hokan (22), Panoan (22), Ramu-Lower Sepik (21), Chibchan (19), Eleman (19), Huitotoan (14), Kiwaian (14), Kadugli (11), Choco (9), Eskimo-Aleut (9), Japanese (9), Left-May (9), Sentani (9), Yanomam (9), Gogodala-Suki (8), Matacoan (8), Arauan (7), East-Strickland (7), Barbacoan (6), Caddoan (6), Jivaroan (6), Kwalean (6), Muskogean (6), Nivkh (6), Pauwasi (6), Chukotko-Kamchatkan (5), Chumash (5), Guaicuru (5), Kwomtari-Baibai (5), Cacula-Nukak (4), Kartvelian (4), Teberan-Pawaian (4), Turama-Kikorian (4),

Uru-Chipaya (4), Araucanian (3), Chon (3), East-Bird's Head (3),  
Huavean (3), Inland-Gulf (3), Kayagar (3), Leonhard-Schultze (3),  
Mascoian (3), Mombum (3), Nambiquaran (3), Peba-Aguan (3), Senagi (3),  
West Bomberai (3), Bilua (2), Cahuapanan (2), Chapacura-Wanham (2),  
Jabuti (2), Kaure (2), Misumalpan (2), Oregon Coast (2), Puinave (2),  
Saliban (2), South Andamanese (2), West Bougainville (2), Yuat (2),  
Yuracara (2), Aikana (1), Ainu (1), Atakapa (1), Bangi-Me (1), Basque (1),  
Borumeso (1), Candoshi (1), Chibchan (1), Chimakuan (1), Chimuan (1),  
Chiquito (1), Dagan (1), Guachi (1), Kapauri (1), Kapixana (1), Kehu (1),  
Korean (1), Kujarge (1), Kusunda (1), Kutenai (1), Lavukaleve (1), Leco (1),  
Maku (1), Molof (1), Movima (1), Munich (1), Mura (1), Odiai (1),  
Payagua (1), Salinan (1), Shom Peng (1), Sulka (1), Takelma (1), Trumai (1),  
Usku (1), Waorani (1), Wasi (1), Yale (1), Yareban (1), Yaruro (1), Yele (1),  
Zuni (1),

## 2. PMI scores

	<b>p</b>	<b>b</b>	<b>f</b>	<b>v</b>	<b>m</b>	<b>w</b>	<b>8</b>	<b>4</b>	<b>t</b>	<b>d</b>	<b>s</b>
<b>p</b>	3.69	0.36	0.10	-0.92	-2.88	-1.66	-3.94	-1.19	-4.30	-6.59	-2.70
<b>b</b>	0.36	3.62	-2.02	1.39	-0.89	0.30	-3.58	-1.52	-5.09	-4.84	-5.63
<b>f</b>	0.10	-2.02	5.26	0.82	-4.62	-1.25	-1.11	-0.31	-3.14	-5.71	-0.76
<b>v</b>	-0.92	1.39	0.82	4.62	-1.78	1.66	-1.13	0.23	-5.13	-4.07	-3.48
<b>m</b>	-2.88	-0.89	-4.62	-1.78	3.15	-1.80	-4.29	-2.24	-6.35	-6.54	-3.75
<b>w</b>	-1.66	0.30	-1.25	1.66	-1.80	3.85	-3.38	-0.64	-5.19	-6.73	-6.83
<b>8</b>	-3.94	-3.58	-1.11	-1.13	-4.29	-3.38	5.49	2.37	2.11	2.52	1.92
<b>4</b>	-1.19	-1.52	-0.31	0.23	-2.24	-0.64	2.37	7.15	-1.34	-0.69	-1.48
<b>t</b>	-4.30	-5.09	-3.14	-5.13	-6.35	-5.19	2.11	-1.34	3.15	-0.10	-1.67
<b>d</b>	-6.59	-4.84	-5.71	-4.07	-6.54	-6.73	2.52	-0.69	-0.10	3.41	-2.29
<b>s</b>	-2.70	-5.63	-0.76	-3.48	-3.75	-6.83	1.92	-1.48	-1.67	-2.29	3.50
<b>z</b>	-4.38	-1.11	-1.79	-1.01	-2.94	-2.50	2.03	0.14	-0.27	1.44	0.65
<b>c</b>	-2.51	-2.72	-2.79	-2.25	-6.33	-5.42	-0.33	-0.07	-0.88	0.85	0.42
<b>n</b>	-6.63	-6.45	-6.85	-4.70	-3.80	-5.79	-4.58	0.04	-2.85	-1.12	-5.72
<b>r</b>	-6.32	-6.65	-5.03	-3.52	-5.50	-5.77	-1.92	-1.81	-2.23	-0.72	-3.73
<b>l</b>	-6.31	-0.71	-6.11	-5.58	-2.37	-7.14	-0.50	-1.79	-2.61	0.74	-3.38
<b>S</b>	-4.30	-3.43	-0.83	-3.98	-4.37	-5.54	-0.55	-0.20	-1.73	-1.88	2.44
<b>Z</b>	-3.95	-3.59	-3.07	-1.84	-3.90	-2.70	0.45	1.25	-1.04	0.52	-2.16
<b>C</b>	-3.80	-2.24	-3.13	-2.88	-6.45	-5.54	0.39	-0.20	-0.18	-0.88	0.23
<b>j</b>	-4.98	-5.31	-4.09	-3.56	-5.33	-3.04	0.25	0.23	-3.63	0.77	-1.21
<b>T</b>	-4.85	-2.88	-3.97	-2.74	-5.21	-4.99	0.00	0.35	-2.56	0.54	-1.03
<b>5</b>	-5.40	-5.73	-4.52	-3.98	-3.67	-3.14	-2.94	2.99	-6.24	-5.59	-3.90
<b>y</b>	-6.57	-1.67	-5.68	-1.51	-7.61	-2.37	-1.40	-1.36	-5.80	-2.43	-1.07
<b>k</b>	-6.05	-6.16	-2.56	-6.01	-5.12	-5.27	-4.98	-2.23	-3.01	-4.49	-2.61
<b>g</b>	-5.12	-3.31	-4.53	-2.60	-7.56	-2.30	-4.05	-1.30	-6.66	-2.79	-6.11
<b>x</b>	-1.44	-3.11	-3.50	-1.58	-4.18	-2.51	-2.62	0.13	-3.73	-5.27	-0.72
<b>N</b>	-6.44	-6.08	-5.56	-3.92	-3.23	-1.84	-3.98	2.23	-6.19	-6.63	-6.73
<b>q</b>	-2.73	-5.00	-3.79	-3.25	-4.62	-2.86	-2.21	0.54	-5.52	-4.86	-3.35
<b>G</b>	-1.22	-0.85	-0.33	0.20	-2.26	-1.36	1.24	3.99	-2.06	-1.41	-1.51
<b>X</b>	-4.24	-4.57	-3.36	-2.82	-5.29	-4.38	-1.78	0.97	-4.39	-4.43	-0.36
<b>h</b>	-0.49	-3.24	-0.47	-2.11	-6.26	-2.13	-0.85	-1.10	-1.76	-2.81	0.26
<b>7</b>	-4.31	-6.25	-5.03	-4.50	-6.27	-2.42	-2.76	-0.71	-4.68	-4.50	-5.52
<b>L</b>	-3.25	-4.67	-3.46	-2.92	-5.39	-3.38	2.73	0.86	-3.80	-3.84	1.16
<b>!</b>	-0.94	1.73	-0.05	0.48	-1.98	0.53	1.52	4.27	-1.78	-1.13	-1.23
<b>i</b>	-6.75	-8.46	-7.25	-6.71	-6.98	-8.27	-3.48	-2.93	-8.98	-8.33	-7.04
<b>e</b>	-7.47	-7.80	-6.59	-6.05	-8.52	-7.61	-5.01	-2.26	-6.01	-7.66	-7.76
<b>E</b>	-6.51	-6.84	-5.63	-5.09	-7.56	-6.65	-3.36	-1.30	-7.36	-6.70	-6.80
<b>3</b>	-6.74	-7.07	-5.85	-5.32	-3.12	-6.88	-1.23	-1.53	-7.58	-6.93	-4.73
<b>a</b>	-8.49	-8.82	-7.60	-7.07	-9.54	-8.63	-4.64	-3.28	-7.03	-7.07	-8.78
<b>u</b>	-6.62	-8.05	-4.64	-2.80	-8.07	-0.72	-5.26	-2.51	-8.56	-7.91	-8.01
<b>o</b>	-7.08	-8.10	-6.89	-3.78	-8.82	-4.96	-5.31	-2.56	-8.61	-7.96	-8.06

	<b>z</b>	<b>c</b>	<b>n</b>	<b>r</b>	<b>l</b>	<b>S</b>	<b>Z</b>	<b>C</b>	<b>j</b>	<b>T</b>	<b>5</b>
<b>p</b>	-4.38	-2.51	-6.63	-6.32	-6.31	-4.30	-3.95	-3.80	-4.98	-4.85	-5.40
<b>b</b>	-1.11	-2.72	-6.45	-6.65	-0.71	-3.43	-3.59	-2.24	-5.31	-2.88	-5.73
<b>f</b>	-1.79	-2.79	-6.85	-5.03	-6.11	-0.83	-3.07	-3.13	-4.09	-3.97	-4.52
<b>v</b>	-1.01	-2.25	-4.70	-3.52	-5.58	-3.98	-1.84	-2.88	-3.56	-2.74	-3.98
<b>m</b>	-2.94	-6.33	-3.80	-5.50	-2.37	-4.37	-3.90	-6.45	-5.33	-5.21	-3.67
<b>w</b>	-2.50	-5.42	-5.79	-5.77	-7.14	-5.54	-2.70	-5.54	-3.04	-4.99	-3.14
<b>8</b>	2.03	-0.33	-4.58	-1.92	-0.50	-0.55	0.45	0.39	0.25	0.00	-2.94
<b>4</b>	0.14	-0.07	0.04	-1.81	-1.79	-0.20	1.25	-0.20	0.23	0.35	2.99
<b>t</b>	-0.27	-0.88	-2.85	-2.23	-2.61	-1.73	-1.04	-0.18	-3.63	-2.56	-6.24
<b>d</b>	1.44	0.85	-1.12	-0.72	0.74	-1.88	0.52	-0.88	0.77	0.54	-5.59
<b>s</b>	0.65	0.42	-5.72	-3.73	-3.38	2.44	-2.16	0.23	-1.21	-1.03	-3.90
<b>z</b>	4.95	2.99	-2.11	-0.52	0.76	1.01	2.84	0.85	3.16	1.52	-0.18
<b>c</b>	2.99	4.44	-4.12	-1.96	0.36	0.32	1.95	2.33	1.80	1.64	-2.33
<b>n</b>	-2.11	-4.12	2.73	-2.36	-1.76	-5.35	-4.59	-6.04	-2.60	-4.57	1.06
<b>r</b>	-0.52	-1.96	-2.36	3.34	1.04	-3.46	-1.48	-4.92	-1.86	-1.92	-5.32
<b>l</b>	0.76	0.36	-1.76	1.04	3.65	-1.49	0.68	-1.85	0.69	-0.06	-1.94
<b>S</b>	1.01	0.32	-5.35	-3.46	-1.49	4.90	2.19	0.90	0.08	-0.91	-4.40
<b>Z</b>	2.84	1.95	-4.59	-1.48	0.68	2.19	5.62	1.99	3.93	2.52	-1.34
<b>C</b>	0.85	2.33	-6.04	-4.92	-1.85	0.90	1.99	4.76	1.10	1.61	1.57
<b>j</b>	3.16	1.80	-2.60	-1.86	0.69	0.08	3.93	1.10	4.82	2.17	-2.19
<b>T</b>	1.52	1.64	-4.57	-1.92	-0.06	-0.91	2.52	1.61	2.17	4.20	-2.75
<b>5</b>	-0.18	-2.33	1.06	-5.32	-1.94	-4.40	-1.34	1.57	-2.19	-2.75	5.15
<b>y</b>	1.41	-0.56	-2.04	-2.67	-1.01	-2.11	0.73	-1.01	1.37	-0.56	0.71
<b>k</b>	-6.11	-2.53	-5.82	-5.75	-3.36	-1.89	-4.99	-0.73	-2.38	-1.92	-6.44
<b>g</b>	-2.00	-1.80	-4.28	-2.63	-3.52	-5.51	0.35	-3.72	0.21	-1.97	-4.82
<b>x</b>	-0.22	-3.96	-4.21	-0.02	-2.54	1.06	-0.07	-2.29	-0.95	-2.44	-3.39
<b>N</b>	-5.11	-5.32	-0.25	-3.97	-5.65	-5.45	-3.99	-5.45	-5.02	-2.70	-0.07
<b>q</b>	-3.34	-3.55	-5.31	-5.29	-5.27	-2.58	-2.22	-3.68	-2.56	-3.13	-3.67
<b>G</b>	0.11	-0.10	-2.55	-0.74	-1.82	-0.22	1.23	-0.22	0.90	0.33	-0.22
<b>X</b>	-2.91	-2.43	-5.57	-3.25	-3.45	-2.14	0.00	-1.86	0.27	-2.69	-3.24
<b>h</b>	0.22	-2.14	-5.00	-1.21	-4.51	0.73	0.13	-1.51	-0.38	-4.07	-4.62
<b>7</b>	-2.98	-4.80	-2.84	-3.28	-5.42	-4.92	-2.08	-2.84	-3.80	-3.68	-3.53
<b>L</b>	-2.32	0.90	-4.98	-3.57	1.88	0.46	4.19	0.05	0.91	-2.80	-1.96
<b>!</b>	1.78	0.18	-2.27	-1.55	-1.54	0.06	1.51	0.06	0.48	0.61	0.06
<b>i</b>	-6.80	-7.01	-7.67	-8.75	-5.90	-7.14	-5.69	-7.14	-4.77	-6.59	-4.36
<b>e</b>	-6.14	-6.35	-7.41	-6.99	-3.89	-6.47	-5.02	-6.47	-4.95	-5.92	-5.37
<b>E</b>	-4.49	-5.39	-7.84	-6.43	-7.11	-5.51	-4.06	-5.52	-5.09	-4.96	-5.51
<b>3</b>	-3.80	-5.62	-8.07	-6.26	-7.34	-5.74	-4.29	-4.13	-3.93	-5.19	-3.44
<b>a</b>	-7.16	-7.37	-9.82	-9.11	-6.79	-7.49	-6.04	-6.40	-7.07	-6.94	-7.49
<b>u</b>	-4.78	-6.60	-6.85	-8.34	-7.22	-6.72	-5.27	-6.72	-6.30	-6.17	-6.72
<b>o</b>	-6.44	-6.65	-9.10	-8.39	-7.27	-6.77	-5.32	-6.78	-6.35	-6.22	-6.77

	y	k	g	x	N	q	G	X	h	7	L
<b>p</b>	-6.57	-6.05	-5.12	-1.44	-6.44	-2.73	-1.22	-4.24	-0.49	-4.31	-3.25
<b>b</b>	-1.67	-6.16	-3.31	-3.11	-6.08	-5.00	-0.85	-4.57	-3.24	-6.25	-4.67
<b>f</b>	-5.68	-2.56	-4.53	-3.50	-5.56	-3.79	-0.33	-3.36	-0.47	-5.03	-3.46
<b>v</b>	-1.51	-6.01	-2.60	-1.58	-3.92	-3.25	0.20	-2.82	-2.11	-4.50	-2.92
<b>m</b>	-7.61	-5.12	-7.56	-4.18	-3.23	-4.62	-2.26	-5.29	-6.26	-6.27	-5.39
<b>w</b>	-2.37	-5.27	-2.30	-2.51	-1.84	-2.86	-1.36	-4.38	-2.13	-2.42	-3.38
<b>8</b>	-1.40	-4.98	-4.05	-2.62	-3.98	-2.21	1.24	-1.78	-0.85	-2.76	2.73
<b>4</b>	-1.36	-2.23	-1.30	0.13	2.23	0.54	3.99	0.97	-1.10	-0.71	0.86
<b>t</b>	-5.80	-3.01	-6.66	-3.73	-6.19	-5.52	-2.06	-4.39	-1.76	-4.68	-3.80
<b>d</b>	-2.43	-4.49	-2.79	-5.27	-6.63	-4.86	-1.41	-4.43	-2.81	-4.50	-3.84
<b>s</b>	-1.07	-2.61	-6.11	-0.72	-6.73	-3.35	-1.51	-0.36	0.26	-5.52	1.16
<b>z</b>	1.41	-6.11	-2.00	-0.22	-5.11	-3.34	0.11	-2.91	0.22	-2.98	-2.32
<b>c</b>	-0.56	-2.53	-1.80	-3.96	-5.32	-3.55	-0.10	-2.43	-2.14	-4.80	0.90
<b>n</b>	-2.04	-5.82	-4.28	-4.21	-0.25	-5.31	-2.55	-5.57	-5.00	-2.84	-4.98
<b>r</b>	-2.67	-5.75	-2.63	-0.02	-3.97	-5.29	-0.74	-3.25	-1.21	-3.28	-3.57
<b>l</b>	-1.01	-3.36	-3.52	-2.54	-5.65	-5.27	-1.82	-3.45	-4.51	-5.42	1.88
<b>S</b>	-2.11	-1.89	-5.51	1.06	-5.45	-2.58	-0.22	-2.14	0.73	-4.92	0.46
<b>Z</b>	0.73	-4.99	0.35	-0.07	-3.99	-2.22	1.23	0.00	0.13	-2.08	4.19
<b>C</b>	-1.01	-0.73	-3.72	-2.29	-5.45	-3.68	-0.22	-1.86	-1.51	-2.84	0.05
<b>j</b>	1.37	-2.38	0.21	-0.95	-5.02	-2.56	0.90	0.27	-0.38	-3.80	0.91
<b>T</b>	-0.56	-1.92	-1.97	-2.44	-2.70	-3.13	0.33	-2.69	-4.07	-3.68	-2.80
<b>5</b>	0.71	-6.44	-4.82	-3.39	-0.07	-3.67	-0.22	-3.24	-4.62	-3.53	-1.96
<b>y</b>	3.51	-3.53	-3.68	-0.88	-4.82	-3.74	-1.39	-1.08	-2.05	-1.82	0.21
<b>k</b>	-3.53	2.78	-0.21	0.88	-2.35	2.09	2.12	1.04	-0.86	-1.17	-5.38
<b>g</b>	-3.68	-0.21	3.04	0.67	-1.76	1.68	3.02	1.02	-3.16	-1.11	-3.76
<b>x</b>	-0.88	0.88	0.67	4.22	-1.79	1.82	2.30	3.01	2.24	-0.75	-0.46
<b>N</b>	-4.82	-2.35	-1.76	-1.79	3.91	-4.02	1.51	-4.28	-4.27	-3.32	-4.39
<b>q</b>	-3.74	2.09	1.68	1.82	-4.02	5.35	4.94	3.75	0.52	1.20	-1.52
<b>G</b>	-1.39	2.12	3.02	2.30	1.51	4.94	6.36	3.99	0.48	-0.04	0.84
<b>X</b>	-1.08	1.04	1.02	3.01	-4.28	3.75	3.99	6.06	1.80	0.13	-2.18
<b>h</b>	-2.05	-0.86	-3.16	2.24	-4.27	0.52	0.48	1.80	3.50	-0.75	-0.76
<b>7</b>	-1.82	-1.17	-1.11	-0.75	-3.32	1.20	-0.04	0.13	-0.75	3.58	-3.86
<b>L</b>	0.21	-5.38	-3.76	-0.46	-4.39	-1.52	0.84	-2.18	-0.76	-3.86	6.06
<b>!</b>	-1.11	-1.97	0.90	0.38	0.12	0.79	4.24	1.22	-0.85	-0.46	1.81
<b>i</b>	-1.08	-7.78	-8.24	-6.81	-8.18	-6.41	-2.95	-4.36	-6.66	-6.55	-6.08
<b>e</b>	-6.54	-7.12	-7.58	-6.15	-4.80	-5.74	-2.29	-5.31	-7.38	-6.29	-5.41
<b>E</b>	-6.68	-7.55	-6.62	-5.19	-6.55	-4.78	-1.33	-4.35	-6.42	-6.03	-4.46
<b>3</b>	-3.47	-7.77	-6.85	-4.73	-6.78	-5.01	-1.56	-4.58	-6.65	-6.26	-4.68
<b>a</b>	-7.27	-9.52	-8.60	-7.17	-8.53	-6.76	-3.31	-6.33	-8.40	-8.01	-6.43
<b>u</b>	-4.75	-7.37	-7.83	-6.40	-7.76	-5.99	-2.54	-5.56	-7.63	-6.54	-5.66
<b>o</b>	-7.94	-8.11	-7.88	-6.45	-7.81	-5.35	-2.59	-4.51	-7.68	-7.29	-5.71

	!	i	e	E	3	a	u	o
<b>p</b>	-0.94	-6.75	-7.47	-6.51	-6.74	-8.49	-6.62	-7.08
<b>b</b>	1.73	-8.46	-7.80	-6.84	-7.07	-8.82	-8.05	-8.10
<b>f</b>	-0.05	-7.25	-6.59	-5.63	-5.85	-7.60	-4.64	-6.89
<b>v</b>	0.48	-6.71	-6.05	-5.09	-5.32	-7.07	-2.80	-3.78
<b>m</b>	-1.98	-6.98	-8.52	-7.56	-3.12	-9.54	-8.07	-8.82
<b>w</b>	0.53	-8.27	-7.61	-6.65	-6.88	-8.63	-0.72	-4.96
<b>8</b>	1.52	-3.48	-5.01	-3.36	-1.23	-4.64	-5.26	-5.31
<b>4</b>	4.27	-2.93	-2.26	-1.30	-1.53	-3.28	-2.51	-2.56
<b>t</b>	-1.78	-8.98	-6.01	-7.36	-7.58	-7.03	-8.56	-8.61
<b>d</b>	-1.13	-8.33	-7.66	-6.70	-6.93	-7.07	-7.91	-7.96
<b>s</b>	-1.23	-7.04	-7.76	-6.80	-4.73	-8.78	-8.01	-8.06
<b>z</b>	1.78	-6.80	-6.14	-4.49	-3.80	-7.16	-4.78	-6.44
<b>c</b>	0.18	-7.01	-6.35	-5.39	-5.62	-7.37	-6.60	-6.65
<b>n</b>	-2.27	-7.67	-7.41	-7.84	-8.07	-9.82	-6.85	-9.10
<b>r</b>	-1.55	-8.75	-6.99	-6.43	-6.26	-9.11	-8.34	-8.39
<b>l</b>	-1.54	-5.90	-3.89	-7.11	-7.34	-6.79	-7.22	-7.27
<b>S</b>	0.06	-7.14	-6.47	-5.51	-5.74	-7.49	-6.72	-6.77
<b>Z</b>	1.51	-5.69	-5.02	-4.06	-4.29	-6.04	-5.27	-5.32
<b>C</b>	0.06	-7.14	-6.47	-5.52	-4.13	-6.40	-6.72	-6.78
<b>j</b>	0.48	-4.77	-4.95	-5.09	-3.93	-7.07	-6.30	-6.35
<b>T</b>	0.61	-6.59	-5.92	-4.96	-5.19	-6.94	-6.17	-6.22
<b>5</b>	0.06	-4.36	-5.37	-5.51	-3.44	-7.49	-6.72	-6.77
<b>y</b>	-1.11	-1.08	-6.54	-6.68	-3.47	-7.27	-4.75	-7.94
<b>k</b>	-1.97	-7.78	-7.12	-7.55	-7.77	-9.52	-7.37	-8.11
<b>g</b>	0.90	-8.24	-7.58	-6.62	-6.85	-8.60	-7.83	-7.88
<b>x</b>	0.38	-6.81	-6.15	-5.19	-4.73	-7.17	-6.40	-6.45
<b>N</b>	0.12	-8.18	-4.80	-6.55	-6.78	-8.53	-7.76	-7.81
<b>q</b>	0.79	-6.41	-5.74	-4.78	-5.01	-6.76	-5.99	-5.35
<b>G</b>	4.24	-2.95	-2.29	-1.33	-1.56	-3.31	-2.54	-2.59
<b>X</b>	1.22	-4.36	-5.31	-4.35	-4.58	-6.33	-5.56	-4.51
<b>h</b>	-0.85	-6.66	-7.38	-6.42	-6.65	-8.40	-7.63	-7.68
<b>7</b>	-0.46	-6.55	-6.29	-6.03	-6.26	-8.01	-6.54	-7.29
<b>L</b>	1.81	-6.08	-5.41	-4.46	-4.68	-6.43	-5.66	-5.71
<b>!</b>	8.02	-2.67	-2.01	-1.05	-1.28	-3.03	-2.26	-2.31
<b>i</b>	-2.67	2.37	-0.48	-0.53	-0.51	-2.35	-1.32	-2.81
<b>e</b>	-2.01	-0.48	2.40	0.67	-1.09	-1.35	-2.88	-1.52
<b>E</b>	-1.05	-0.53	0.67	3.10	-0.25	-0.27	-2.64	-1.22
<b>3</b>	-1.28	-0.51	-1.09	-0.25	2.69	-0.55	-0.33	-1.24
<b>a</b>	-3.03	-2.35	-1.35	-0.27	-0.55	1.88	-2.54	-1.66
<b>u</b>	-2.26	-1.32	-2.88	-2.64	-0.33	-2.54	2.76	-0.27
<b>o</b>	-2.31	-2.81	-1.52	-1.22	-1.24	-1.66	-0.27	2.48