FREQUENCY DISTRIBUTIONS OF ENGLISH TETRAGRAPHS

Frequency distributions of English tetragraphs appearing in 50,000 letters of government plaintext telegrams.

Table C-1. The 54 tetragraphs appearing 50 or more times, arranged by absolute frequencies, accompanied by the logarithms of their assigned probabilities.

	F	L_{10} (F)	L_{244} (F)		F	L_{10} (F)	L_{244} (F)		F	L_{10} (F)	L_{244} (F)
TION	218	2.34	.99	THIR	104	2.02	.87	ASHT	64	1.81	.79
EVEN	168	2.23	.95	EENT	102	2.01	.87	HUND	64	1.81	.79
TEEN	163	2.21	.94	REQU	98	1.99	.86	DRED	63	1.80	.79
ENTY	161	2.21	.94	HIRT	97	1.99	.86	RIOD	63	1.80	.79
STOP	154	2.19	.93	COMM	93	1.97	.85	ENTS	62	1.79	.78
NINE	153	2.18	.93	QUES	87	1.94	.84	FFIC	62	1.79	.78
WENT	153	2.18	.93	UEST	87	1.94	.84	IVED	62	1.79	.78
TWEN	152	2.18	.93	EQUE	86	1.93	.84	FROM	59	1.77	.78
THRE	149	2.17	.93	NDRE	77	1.89	.82	IRTY	59	1.77	.78
FOUR	144	2.16	.92	LLAR	71	1.85	.81	RTEE	59	1.77	.78
IGHT	140	2.15	.92	OMMA	71	1.85	.81	UNDR	59	1.77	.78
FIVE	135	2.13	.91	OLLA	70	1.85	.81	NAUG	56	1.75	.77
HREE	134	2.13	.91	VENT	70	1.85	.81	OURT	56	1.75	.77
DASH	132	2.12	.91	DOLL	68	1.83	.80	UGHT	56	1.75	.77
EIGH	132	2.12	.91	LARS	68	1.83	.80	STAT	54	1.73	.76
SEVE	121	2.08	.89	THIS	68	1.83	.80	AUGH	52	1.72	.76
ENTH	114	2.06	.89	PERI	67	1.83	.80	CENT	52	1.72	.76
MENT	111	2.05	.88	ERIO	66	1.82	.80	FICE	50	1.70	.75

Table C-2. The 54 tetragraphs appearing 50 or more times, arranged in alphabetic order by their first letters, then by absolute frequencies, accompanied by the logarithms of their assigned probabilities.

	F	L_{10} (F)	L_{244} (F)		F	L_{10} (F)	L_{244} (F)		F	L_{10} (F)	L_{244} (F)
ASHT	64	1.81	.79	HREE	134	2.13	.91	REQU	98	1.99	.86
AUGH	52	1.72	.76	HIRT	97	1.99	.86	RIOD	63	1.80	.79
				HUND	64	1.81	.79	RTEE	59	1.77	.78
COMM	93	1.97	.85								
CENT	52	1.72	.76	IGHT	140	2.15	.92	STOP	154	2.19	.93
				IVED	62	1.79	.78	SEVE	121	2.08	.89
DASH	132	2.12	.91	IRTY	59	1.77	.78	STAT	54	1.73	.76
DOLL	68	1.83	.80								
DRED	63	1.80	.79	LLAR	71	1.85	.81	TION	218	2.34	.99
				LARS	68	1.83	.80	TEEN	163	2.21	.94
EVEN	168	2.23	.95					TWEN	152	2.18	.93
ENTY	161	2.21	.94	MENT	111	2.05	.88	THRE	149	2.17	.93
EIGH	132	2.12	.91					THIR	104	2.02	.87
ENTH	114	2.06	.89	NINE	153	2.18	.93	THIS	68	1.83	.80
EENT	102	2.01	.87	NDRE	77	1.89	.82				
EQUE	86	1.93	.84	NAUG	56	1.75	.77	UEST	87	1.94	.84
ERIO	66	1.82	.80					UNDR	59	1.77	.78
ENTS	62	1.79	.78	OMMA	71	1.85	.81	UGHT	56	1.75	.77
				OLLA	70	1.85	.81				
FOUR	144	2.16	.92	OURT	56	1.75	.77	VENT	70	1.85	.81
FIVE	135	2.13	.91								
FFIC	62	1.79	.78	PERI	67	1.83	.80				
FROM	59	1.77	.78								
FICE	50	1.70	.75	QUES	87	1.94	.84	WENT	153	2.18	.93

Table C-3. The 54 tetragraphs appearing 50 or more times, arranged in alphabetic order by their second letters, and then according to their absolute frequencies, accompanied by the logarithms of their assigned probabilities.

	F	$L_{10}(F)$	$L_{244}(F)$		F	$L_{10}(F)$	$L_{244}(F)$		F	$L_{10}(F)$	$L_{244}(F)$
DASH	132	2.12	.91	TION	218	2.34	.99	HREE	134	2.13	.91
LARS	68	1.83	.80	NINE	153	2.18	.93	ERIO	66	1.82	.80
NAUG	56	1.75	.77	FIVE	135	2.13	.91	DRED	63	1.80	.79
				EIGH	132	2.12	.91	FROM	59	1.77	.78
NDRE	77	1.89	.82	HIRT	97	1.99	.86	IRTY	59	1.77	.78
				RIOD	63	1.80	.79				
TEEN	163	2.21	.94	FICE	50	1.70	.75				
WENT	153	2.18	.93					ASHT	64	1.81	.79
SEVE	121	2.08	.89	LLAR	71	1.85	.81				
MENT	111	2.05	.88	OLLA	70	1.85	.81	STOP	154	2.19	.93
EENT	102	2.01	.87					RTEE	59	1.77	.78
REQU	98	1.99	.86					STAT	54	1.73	.76
UEST	87	1.94	.84	OMMA	71	1.85	.81				
VENT	70	1.85	.81								
PERI	67	1.83	.80	ENTY	161	2.21	.94	QUES	87	1.94	.84
CENT	52	1.72	.76	ENTH	114	2.06	.89	HUND	64	1.81	.79
				ENTS	62	1.79	.78	OURT	56	1.75	.77
FFIC	62	1.79	.78	UNDR	59	1.77	.78	AUGH	52	1.72	.76
IGHT	140	2.15	.92	FOUR	144	2.16	.92				
UGHT	56	1.75	.77	COMM	93	1.97	.85				
				DOLL	68	1.83	.80	EVEN	168	2.23	.95
THRE	149	2.17	.93					IVED	62	1.79	.78
THIR	104	2.02	.87								
THIS	68	1.83	.80	EQUE	86	1.93	.84	TWEN	152	2.18	.93

Table C-4. The 54 tetragraphs appearing 50 or more times, arranged in alphabetic order by their third letters, then by absolute frequencies, accompanied by the logarithms of their assigned probabilities.

	F	$L_{10}(F)$	$L_{244}(F)$		F	$L_{10}(F)$	$L_{244}(F)$		F	$L_{10}(F)$	$L_{244}(F)$
LLAR	71	1.85	.81	THIR	104	2.02	.87	REQU	98	1.99	.86
STAT	54	1.73	.76	THIS	68	1.83	.80				
				ERIO	66	1.82	.80	THRE	149	2.17	.93
FICE	50	1.70	.75	FFIC	62	1.79	.78	HIRT	97	1.99	.86
								NDRE	77	1.89	.82
UNDR	59	1.77	.78	OLLA	70	1.85	.81	LARS	68	1.83	.80
				DOLL	68	1.83	.80	PERI	67	1.83	.80
EVEN	168	2.23	.95					OURT	56	1.75	.77
TEEN	163	2.21	.94								
TWEN	152	2.18	.93	COMM	93	1.97	.85	DASH	132	2.12	.91
HREE	134	2.13	.91	OMMA	71	1.85	.81	UEST	87	1.94	.84
QUES	87	1.94	.84								
DRED	63	1.80	.79	NINE	153	2.18	.93	ENTY	161	2.21	.94
IVED	62	1.79	.78	WENT	153	2.18	.93	ENTH	114	2.06	.89
RTEE	59	1.77	.78	MENT	111	2.05	.88	ENTS	62	1.79	.78
				EENT	102	2.01	.87	IRTY	59	1.77	.78
				VENT	70	1.85	.81				
				HUND	64	1.81	.79	FOUR	144	2.16	.92
EIGH	132	2.12	.91	CENT	52	1.72	.76	EQUE	86	1.93	.84
AUGH	52	1.72	.76					NAUG	56	1.75	.77
				TION	218	2.34	.99				
IGHT	140	2.15	.92	STOP	154	2.19	.93				
ASHT	64	1.81	.79	RIOD	63	1.80	.79	FIVE	135	2.13	.91
UGHT	56	1.75	.77	FROM	59	1.77	.78	SEVE	121	2.08	.89

Table C-5. The tetragraphs appearing 50 or more times, arranged in alphabetic order by their fourth letters, then by absolute frequencies, accompanied by the logarithms of their assigned probabilities.

	F	L_{10} (F)	L_{244} (F)		F	L_{10} (F)	L_{244} (F)		F	L_{10} (F)	L_{244} (F)
OMMA	71	1.85	.81	DASH	132	2.12	.91	QUES	87	1.94	.84
OLLA	70	1.85	.81	EIGH	132	2.12	.91	LARS	68	1.83	.80
				ENTH	114	2.06	.89	THIS	68	1.83	.80
				AUGH	52	1.72	.76	ENTS	62	1.79	.78
FFIC	62	1.79	.78								
				PERI	67	1.83	.80				
								WENT	153	2.18	.93
HUND	64	1.81	.79	DOLL	68	1.83	.80	IGHT	140	2.15	.92
DRED	63	1.80	.79					MENT	111	2.05	.88
RIOD	63	1.80	.79	COMM	93	1.97	.85	EENT	102	2.01	.87
IVED	62	1.79	.78	FROM	59	1.77	.78	HIRT	97	1.99	.86
								UEST	87	1.94	.84
				TION	218	2.34	.99	VENT	70	1.85	.81
NINE	153	2.18	.93	EVEN	168	2.23	.95	ASHT	64	1.81	.79
THRE	149	2.17	.93	TEEN	163	2.21	.94	OURT	56	1.75	.77
FIVE	135	2.13	.91	TWEN	152	2.18	.93	UGHT	56	1.75	.77
HREE	134	2.13	.91					STAT	54	1.73	.76
SEVE	121	2.08	.89	ERIO	66	1.82	.80	CENT	52	1.72	.76
EQUE	86	1.93	.84								
NDRE	77	1.89	.82	STOP	154	2.19	.93				
RTEE	59	1.77	.78					REQU	98	1.99	.86
FICE	50	1.70	.75	FOUR	144	2.16	.92				
				THIR	104	2.02	.87				
				LLAR	71	1.85	.81	ENTY	161	2.21	.94
NAUG	56	1.75	.77	UNDR	59	1.77	.78	IRTY	59	1.77	.78