

# A. Tabellenanhang

**Tabelle A.1.** Verteilungsfunktion  $\Phi(z)$  der Standardnormalverteilung  $N(0, 1)$

$z$	.00	.01	.02	.03	.04
0.0	0.500000	0.503989	0.507978	0.511966	0.515953
0.1	0.539828	0.543795	0.547758	0.551717	0.555670
0.2	0.579260	0.583166	0.587064	0.590954	0.594835
0.3	0.617911	0.621720	0.625516	0.629300	0.633072
0.4	0.655422	0.659097	0.662757	0.666402	0.670031
0.5	0.691462	0.694974	0.698468	0.701944	0.705401
0.6	0.725747	0.729069	0.732371	0.735653	0.738914
0.7	0.758036	0.761148	0.764238	0.767305	0.770350
0.8	0.788145	0.791030	0.793892	0.796731	0.799546
0.9	0.815940	0.818589	0.821214	0.823814	0.826391
1.0	0.841345	0.843752	0.846136	0.848495	0.850830
1.1	0.864334	0.866500	0.868643	0.870762	0.872857
1.2	0.884930	0.886861	0.888768	0.890651	0.892512
1.3	0.903200	0.904902	0.906582	0.908241	0.909877
1.4	0.919243	0.920730	0.922196	0.923641	0.925066
1.5	0.933193	0.934478	0.935745	0.936992	0.938220
1.6	0.945201	0.946301	0.947384	0.948449	0.949497
1.7	0.955435	0.956367	0.957284	0.958185	0.959070
1.8	0.964070	0.964852	0.965620	0.966375	0.967116
1.9	0.971283	0.971933	0.972571	0.973197	0.973810
2.0	0.977250	0.977784	0.978308	0.978822	0.979325
2.1	0.982136	0.982571	0.982997	0.983414	0.983823
2.2	0.986097	0.986447	0.986791	0.987126	0.987455
2.3	0.989276	0.989556	0.989830	0.990097	0.990358
2.4	0.991802	0.992024	0.992240	0.992451	0.992656
2.5	0.993790	0.993963	0.994132	0.994297	0.994457
2.6	0.995339	0.995473	0.995604	0.995731	0.995855
2.7	0.996533	0.996636	0.996736	0.996833	0.996928
2.8	0.997445	0.997523	0.997599	0.997673	0.997744
2.9	0.998134	0.998193	0.998250	0.998305	0.998359
3.0	0.998650	0.998694	0.998736	0.998777	0.998817

Tabelle A.1. Verteilungsfunktion  $\Phi(z)$  der Standardnormalverteilung  $N(0,1)$ 

$z$	.05	.06	.07	.08	.09
0.0	0.519939	0.523922	0.527903	0.531881	0.535856
0.1	0.559618	0.563559	0.567495	0.571424	0.575345
0.2	0.598706	0.602568	0.606420	0.610261	0.614092
0.3	0.636831	0.640576	0.644309	0.648027	0.651732
0.4	0.673645	0.677242	0.680822	0.684386	0.687933
0.5	0.708840	0.712260	0.715661	0.719043	0.722405
0.6	0.742154	0.745373	0.748571	0.751748	0.754903
0.7	0.773373	0.776373	0.779350	0.782305	0.785236
0.8	0.802337	0.805105	0.807850	0.810570	0.813267
0.9	0.828944	0.831472	0.833977	0.836457	0.838913
1.0	0.853141	0.855428	0.857690	0.859929	0.862143
1.1	0.874928	0.876976	0.879000	0.881000	0.882977
1.2	0.894350	0.896165	0.897958	0.899727	0.901475
1.3	0.911492	0.913085	0.914657	0.916207	0.917736
1.4	0.926471	0.927855	0.929219	0.930563	0.931888
1.5	0.939429	0.940620	0.941792	0.942947	0.944083
1.6	0.950529	0.951543	0.952540	0.953521	0.954486
1.7	0.959941	0.960796	0.961636	0.962462	0.963273
1.8	0.967843	0.968557	0.969258	0.969946	0.970621
1.9	0.974412	0.975002	0.975581	0.976148	0.976705
2.0	0.979818	0.980301	0.980774	0.981237	0.981691
2.1	0.984222	0.984614	0.984997	0.985371	0.985738
2.2	0.987776	0.988089	0.988396	0.988696	0.988989
2.3	0.990613	0.990863	0.991106	0.991344	0.991576
2.4	0.992857	0.993053	0.993244	0.993431	0.993613
2.5	0.994614	0.994766	0.994915	0.995060	0.995201
2.6	0.995975	0.996093	0.996207	0.996319	0.996427
2.7	0.997020	0.997110	0.997197	0.997282	0.997365
2.8	0.997814	0.997882	0.997948	0.998012	0.998074
2.9	0.998411	0.998462	0.998511	0.998559	0.998605
3.0	0.998856	0.998893	0.998930	0.998965	0.998999

Tabelle A.2.  $(1 - \alpha)$ -Quantile  $c_{df;1-\alpha}$  der  $\chi^2$ -Verteilung

$df$	$1 - \alpha$					
	0.01	0.025	0.05	0.95	0.975	0.99
1	0.0001	0.001	0.004	3.84	5.02	6.62
2	0.020	0.051	0.103	5.99	7.38	9.21
3	0.115	0.216	0.352	7.81	9.35	11.3
4	0.297	0.484	0.711	9.49	11.1	13.3
5	0.554	0.831	1.15	11.1	12.8	15.1
6	0.872	1.24	1.64	12.6	14.4	16.8
7	1.24	1.69	2.17	14.1	16.0	18.5
8	1.65	2.18	2.73	15.5	17.5	20.1
9	2.09	2.70	3.33	16.9	19.0	21.7
10	2.56	3.25	3.94	18.3	20.5	23.2
11	3.05	3.82	4.57	19.7	21.9	24.7
12	3.57	4.40	5.23	21.0	23.3	26.2
13	4.11	5.01	5.89	22.4	24.7	27.7
14	4.66	5.63	6.57	23.7	26.1	29.1
15	5.23	6.26	7.26	25.0	27.5	30.6
16	5.81	6.91	7.96	26.3	28.8	32.0
17	6.41	7.56	8.67	27.6	30.2	33.4
18	7.01	8.23	9.39	28.9	31.5	34.8
19	7.63	8.91	10.1	30.1	32.9	36.2
20	8.26	9.59	10.9	31.4	34.2	37.6
25	11.5	13.1	14.6	37.7	40.6	44.3
30	15.0	16.8	18.5	43.8	47.0	50.9
40	22.2	24.4	26.5	55.8	59.3	63.7
50	29.7	32.4	34.8	67.5	71.4	76.2
60	37.5	40.5	43.2	79.1	83.3	88.4
70	45.4	48.8	51.7	90.5	95.0	100.4
80	53.5	57.2	60.4	101.9	106.6	112.3
90	61.8	65.6	69.1	113.1	118.1	124.1
100	70.1	74.2	77.9	124.3	129.6	135.8

Tabelle A.3.  $(1 - \alpha)$ -Quantile  $t_{df;1-\alpha}$  der  $t$ -Verteilung

$df$	$1 - \alpha$			
	0.95	0.975	0.99	0.995
1	6.3138	12.706	31.821	63.657
2	2.9200	4.3027	6.9646	9.9248
3	2.3534	3.1824	4.5407	5.8409
4	2.1318	2.7764	3.7469	4.6041
5	2.0150	2.5706	3.3649	4.0321
6	1.9432	2.4469	3.1427	3.7074
7	1.8946	2.3646	2.9980	3.4995
8	1.8595	2.3060	2.8965	3.3554
9	1.8331	2.2622	2.8214	3.2498
10	1.8125	2.2281	2.7638	3.1693
11	1.7959	2.2010	2.7181	3.1058
12	1.7823	2.1788	2.6810	3.0545
13	1.7709	2.1604	2.6503	3.0123
14	1.7613	2.1448	2.6245	2.9768
15	1.7531	2.1314	2.6025	2.9467
16	1.7459	2.1199	2.5835	2.9208
17	1.7396	2.1098	2.5669	2.8982
18	1.7341	2.1009	2.5524	2.8784
19	1.7291	2.0930	2.5395	2.8609
20	1.7247	2.0860	2.5280	2.8453
30	1.6973	2.0423	2.4573	2.7500
40	1.6839	2.0211	2.4233	2.7045
50	1.6759	2.0086	2.4033	2.6778
60	1.6706	2.0003	2.3901	2.6603
70	1.6669	1.9944	2.3808	2.6479
80	1.6641	1.9901	2.3739	2.6387
90	1.6620	1.9867	2.3685	2.6316
100	1.6602	1.9840	2.3642	2.6259
200	1.6525	1.9719	2.3451	2.6006
300	1.6499	1.9679	2.3388	2.5923
400	1.6487	1.9659	2.3357	2.5882
500	1.6479	1.9647	2.3338	2.5857

Tabelle A.4.  $(1 - \alpha)$ -Quantile  $f_{df_1, df_2; 1 - \alpha}$  der  $F$ -Verteilung für  $\alpha = 0.05$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	161.44	18.512	10.127	7.7086	6.6078	5.9873	5.5914	5.3176	5.1173	4.9846	4.8443	4.7472	4.6671	4.6001
2	199.50	19.000	9.5520	6.9442	5.7861	5.1432	4.7374	4.4589	4.2564	4.1028	3.9822	3.8852	3.8055	3.7388
3	215.70	19.164	9.2766	6.5913	5.4094	4.7570	4.3468	4.0661	3.8625	3.7082	3.5874	3.4902	3.4105	3.3438
4	224.58	19.246	9.1171	6.3882	5.1921	4.5336	4.1203	3.8378	3.6330	3.4780	3.3566	3.2591	3.1791	3.1122
5	230.16	19.296	9.0134	6.2560	5.0503	4.3873	3.9715	3.6874	3.4816	3.3258	3.2038	3.1058	3.0254	2.9582
6	233.98	19.329	8.9406	6.1631	4.9502	4.2838	3.8659	3.5805	3.3737	3.2171	3.0946	2.9961	2.9152	2.8477
7	236.76	19.353	8.8867	6.0942	4.8758	4.2066	3.7870	3.5004	3.2927	3.1354	3.0123	2.9133	2.8320	2.7641
8	238.88	19.370	8.8452	6.0410	4.8183	4.1468	3.7257	3.4381	3.2295	3.0716	2.9479	2.8485	2.7669	2.6986
9	240.54	19.384	8.8122	5.9987	4.7724	4.0990	3.6766	3.3881	3.1788	3.0203	2.8962	2.7963	2.7143	2.6457
10	241.88	19.395	8.7855	5.9643	4.7350	4.0599	3.6365	3.3471	3.1372	2.9782	2.8536	2.7533	2.6710	2.6021
11	242.98	19.404	8.7633	5.9358	4.7039	4.0274	3.6030	3.3129	3.1024	2.9429	2.8179	2.7173	2.6346	2.5654
12	243.90	19.412	8.7446	5.9117	4.6777	3.9999	3.5746	3.2839	3.0729	2.9129	2.7875	2.6866	2.6036	2.5342
13	244.68	19.418	8.7286	5.8911	4.6552	3.9763	3.5503	3.2590	3.0475	2.8871	2.7614	2.6601	2.5769	2.5072
14	245.36	19.424	8.7148	5.8733	4.6357	3.9559	3.5292	3.2373	3.0254	2.8647	2.7386	2.6371	2.5536	2.4837
15	245.94	19.429	8.7028	5.8578	4.6187	3.9380	3.5107	3.2184	3.0061	2.8450	2.7186	2.6168	2.5331	2.4630
16	246.46	19.433	8.6922	5.8441	4.6037	3.9222	3.4944	3.2016	2.9889	2.8275	2.7009	2.5988	2.5149	2.4446
17	246.91	19.436	8.6829	5.8319	4.5904	3.9082	3.4798	3.1867	2.9736	2.8120	2.6850	2.5828	2.4986	2.4281
18	247.32	19.440	8.6745	5.8211	4.5785	3.8957	3.4668	3.1733	2.9600	2.7980	2.6709	2.5684	2.4840	2.4134
19	247.68	19.443	8.6669	5.8113	4.5678	3.8844	3.4551	3.1612	2.9476	2.7854	2.6580	2.5554	2.4708	2.4000
20	248.01	19.445	8.6601	5.8025	4.5581	3.8741	3.4445	3.1503	2.9364	2.7740	2.6464	2.5435	2.4588	2.3878
30	250.09	19.462	8.6165	5.7458	4.4957	3.8081	3.3758	3.0794	2.8636	2.6995	2.5704	2.4662	2.3803	2.3082
40	251.14	19.470	8.5944	5.7169	4.4637	3.7742	3.3404	3.0427	2.8259	2.6608	2.5309	2.4258	2.3391	2.2663
50	251.77	19.475	8.5809	5.6994	4.4444	3.7536	3.3188	3.0203	2.8028	2.6371	2.5065	2.4010	2.3138	2.2405
60	252.19	19.479	8.5720	5.6877	4.4313	3.7397	3.3043	3.0053	2.7872	2.6210	2.4901	2.3841	2.2965	2.2229
70	252.49	19.481	8.5655	5.6793	4.4220	3.7298	3.2938	2.9944	2.7760	2.6095	2.4782	2.3719	2.2841	2.2102
80	252.72	19.483	8.5607	5.6729	4.4149	3.7223	3.2859	2.9862	2.7675	2.6007	2.4692	2.3627	2.2747	2.2006
90	252.89	19.484	8.5569	5.6680	4.4094	3.7164	3.2798	2.9798	2.7608	2.5939	2.4622	2.3555	2.2673	2.1930
100	253.04	19.485	8.5539	5.6640	4.4050	3.7117	3.2748	2.9746	2.7555	2.5884	2.4565	2.3497	2.2613	2.1869

Tabelle A.4.  $(1 - \alpha)$ -Quantile  $f_{df_1, df_2, 1-\alpha}$  der  $F$ -Verteilung für  $\alpha = 0.05$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	15	16	17	18	19	20	30	40	50	60	70	80	90	100
1	4.5430	4.4939	4.4513	4.4138	4.3807	4.3512	4.1708	4.0847	4.0343	4.0011	3.9777	3.9603	3.9468	3.9361
2	3.6823	3.6337	3.5915	3.5545	3.5218	3.4928	3.3158	3.2317	3.1826	3.1504	3.1276	3.1107	3.0976	3.0872
3	3.2873	3.2388	3.1967	3.1599	3.1273	3.0983	2.9222	2.8387	2.7900	2.7580	2.7355	2.7187	2.7058	2.6955
4	3.0555	3.0069	2.9647	2.9277	2.8951	2.8660	2.6896	2.6059	2.5571	2.5252	2.5026	2.4858	2.4729	2.4626
5	2.9012	2.8524	2.8099	2.7728	2.7400	2.7108	2.5335	2.4494	2.4004	2.3682	2.3455	2.3287	2.3156	2.3053
6	2.7904	2.7413	2.6986	2.6613	2.6283	2.5989	2.4205	2.3358	2.2864	2.2540	2.2311	2.2141	2.2010	2.1906
7	2.7066	2.6571	2.6142	2.5767	2.5435	2.5140	2.3343	2.2490	2.1992	2.1665	2.1434	2.1263	2.1130	2.1025
8	2.6407	2.5910	2.5479	2.5101	2.4767	2.4470	2.2661	2.1801	2.1299	2.0969	2.0736	2.0563	2.0429	2.0323
9	2.5876	2.5376	2.4942	2.4562	2.4226	2.3928	2.2106	2.1240	2.0733	2.0400	2.0166	1.9991	1.9855	1.9748
10	2.5437	2.4935	2.4499	2.4117	2.3779	2.3478	2.1645	2.0772	2.0261	1.9925	1.9688	1.9512	1.9375	1.9266
11	2.5068	2.4563	2.4125	2.3741	2.3402	2.3099	2.1255	2.0375	1.9860	1.9522	1.9282	1.9104	1.8966	1.8856
12	2.4753	2.4246	2.3806	2.3420	2.3079	2.2775	2.0920	2.0034	1.9515	1.9173	1.8932	1.8752	1.8613	1.8502
13	2.4481	2.3972	2.3530	2.3143	2.2800	2.2495	2.0629	1.9737	1.9214	1.8870	1.8626	1.8445	1.8304	1.8192
14	2.4243	2.3733	2.3289	2.2900	2.2556	2.2249	2.0374	1.9476	1.8949	1.8602	1.8356	1.8173	1.8032	1.7919
15	2.4034	2.3522	2.3076	2.2686	2.2340	2.2032	2.0148	1.9244	1.8713	1.8364	1.8116	1.7932	1.7789	1.7675
16	2.3848	2.3334	2.2887	2.2495	2.2148	2.1839	1.9946	1.9037	1.8503	1.8151	1.7901	1.7715	1.7571	1.7456
17	2.3682	2.3167	2.2718	2.2325	2.1977	2.1667	1.9764	1.8851	1.8313	1.7958	1.7707	1.7519	1.7374	1.7259
18	2.3533	2.3016	2.2566	2.2171	2.1822	2.1511	1.9601	1.8682	1.8141	1.7784	1.7531	1.7342	1.7195	1.7079
19	2.3398	2.2879	2.2428	2.2032	2.1682	2.1370	1.9452	1.8528	1.7984	1.7625	1.7370	1.7180	1.7032	1.6914
20	2.3275	2.2755	2.2303	2.1906	2.1554	2.1241	1.9316	1.8388	1.7841	1.7479	1.7223	1.7031	1.6882	1.6764
30	2.2467	2.1938	2.1477	2.1071	2.0711	2.0390	1.8408	1.7444	1.6871	1.6491	1.6220	1.6017	1.5859	1.5733
40	2.2042	2.1507	2.1039	2.0628	2.0264	1.9938	1.7917	1.6927	1.6336	1.5942	1.5660	1.5448	1.5283	1.5151
50	2.1779	2.1239	2.0768	2.0353	1.9985	1.9656	1.7608	1.6600	1.5994	1.5590	1.5299	1.5080	1.4909	1.4772
60	2.1601	2.1058	2.0584	2.0166	1.9795	1.9463	1.7399	1.6372	1.5756	1.5343	1.5045	1.4821	1.4645	1.4503
70	2.1471	2.0926	2.0450	2.0030	1.9657	1.9323	1.7239	1.6205	1.5580	1.5160	1.4856	1.4627	1.4447	1.4302
80	2.1373	2.0826	2.0348	1.9926	1.9552	1.9216	1.7120	1.6076	1.5444	1.5018	1.4710	1.4477	1.4294	1.4146
90	2.1296	2.0747	2.0268	1.9845	1.9469	1.9133	1.7026	1.5974	1.5336	1.4905	1.4593	1.4357	1.4170	1.4020
100	2.1234	2.0684	2.0204	1.9780	1.9403	1.9065	1.6950	1.5892	1.5249	1.4813	1.4498	1.4258	1.4069	1.3917

Tabelle A.5.  $(1 - \alpha/2)$ -Quantile  $f_{df_1, df_2; 1-\alpha/2}$  der  $F$ -Verteilung für  $\alpha = 0.05/2$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	647.78	38.506	17.443	12.217	10.006	8.8131	8.0726	7.5708	7.2092	6.9367	6.7241	6.5537	6.4142	6.2979
2	799.50	39.000	16.044	10.649	8.4336	7.2598	6.5415	6.0594	5.7147	5.4563	5.2558	5.0958	4.9652	4.8566
3	864.16	39.165	15.439	9.9791	7.7635	6.5987	5.8898	5.4159	5.0781	4.8256	4.6300	4.4741	4.3471	4.2417
4	899.58	39.248	15.100	9.6045	7.3878	6.2271	5.5225	5.0526	4.7180	4.4683	4.2750	4.1212	3.9958	3.8919
5	921.84	39.298	14.884	9.3644	7.1463	5.9875	5.2852	4.8172	4.4844	4.2360	4.0439	3.8911	3.7666	3.6634
6	937.11	39.331	14.734	9.1973	6.9777	5.8197	5.1185	4.6516	4.3197	4.0721	3.8806	3.7282	3.6042	3.5013
7	948.21	39.355	14.624	9.0741	6.8530	5.6954	4.9949	4.5285	4.1970	3.9498	3.7586	3.6065	3.4826	3.3799
8	956.65	39.373	14.539	8.9795	6.7571	5.5996	4.8993	4.4332	4.1019	3.8548	3.6638	3.5117	3.3879	3.2852
9	963.28	39.386	14.473	8.9046	6.6810	5.5234	4.8232	4.3572	4.0259	3.7789	3.5878	3.4358	3.3120	3.2093
10	968.62	39.397	14.418	8.8438	6.6191	5.4613	4.7611	4.2951	3.9638	3.7167	3.5256	3.3735	3.2496	3.1468
11	973.02	39.407	14.374	8.7935	6.5678	5.4097	4.7094	4.2434	3.9120	3.6649	3.4736	3.3214	3.1974	3.0945
12	976.70	39.414	14.336	8.7511	6.5245	5.3682	4.6658	4.1996	3.8682	3.6209	3.4296	3.2772	3.1531	3.0501
13	979.83	39.421	14.304	8.7149	6.4875	5.3290	4.6284	4.1621	3.8305	3.5831	3.3917	3.2392	3.1150	3.0118
14	982.52	39.426	14.276	8.6837	6.4556	5.2968	4.5960	4.1296	3.7979	3.5504	3.3588	3.2062	3.0818	2.9785
15	984.86	39.431	14.252	8.6565	6.4277	5.2686	4.5677	4.1012	3.7693	3.5216	3.3299	3.1772	3.0527	2.9493
16	986.91	39.435	14.231	8.6325	6.4031	5.2438	4.5428	4.0760	3.7440	3.4962	3.3043	3.1515	3.0269	2.9233
17	988.73	39.439	14.212	8.6113	6.3813	5.2218	4.5206	4.0537	3.7216	3.4736	3.2816	3.1286	3.0038	2.9002
18	990.34	39.442	14.195	8.5923	6.3618	5.2021	4.5007	4.0337	3.7014	3.4533	3.2612	3.1081	2.9832	2.8794
19	991.79	39.445	14.180	8.5753	6.3443	5.1844	4.4829	4.0157	3.6833	3.4351	3.2428	3.0895	2.9645	2.8607
20	993.10	39.447	14.167	8.5599	6.3285	5.1684	4.4667	3.9994	3.6669	3.4185	3.2261	3.0727	2.9476	2.8436
30	1001.4	39.464	14.080	8.4612	6.2268	5.0652	4.3623	3.8940	3.5604	3.3110	3.1176	2.9632	2.8372	2.7323
40	1005.5	39.472	14.036	8.4111	6.1750	5.0124	4.3088	3.8397	3.5054	3.2553	3.0613	2.9063	2.7796	2.6742
50	1008.1	39.477	14.009	8.3807	6.1436	4.9804	4.2763	3.8067	3.4719	3.2213	3.0268	2.8714	2.7443	2.6384
60	1009.8	39.481	13.992	8.3604	6.1225	4.9588	4.2543	3.7844	3.4493	3.1984	3.0035	2.8477	2.7203	2.6141
70	1011.0	39.483	13.979	8.3458	6.1073	4.9434	4.2386	3.7684	3.4330	3.1818	2.9867	2.8307	2.7030	2.5966
80	1011.9	39.485	13.969	8.3348	6.0960	4.9317	4.2267	3.7563	3.4207	3.1693	2.9740	2.8178	2.6899	2.5833
90	1012.6	39.486	13.962	8.3263	6.0871	4.9226	4.2175	3.7469	3.4111	3.1595	2.9640	2.8077	2.6797	2.5729
100	1013.1	39.487	13.956	8.3194	6.0799	4.9154	4.2100	3.7393	3.4034	3.1517	2.9561	2.7996	2.6714	2.5645

Tabelle A.5.  $(1 - \alpha/2)$ -Quantile  $f_{df_1, df_2; 1-\alpha/2}$  der  $F$ -Verteilung für  $\alpha = 0.05/2$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	15	16	17	18	19	20	30	40	50	60	70	80	90	100
1	6.1995	6.1151	6.0420	5.9780	5.9216	5.8714	5.5675	5.4239	5.3403	5.2856	5.2470	5.2183	5.1962	5.1785
2	4.7650	4.6866	4.6188	4.5596	4.5075	4.4612	4.1820	4.0509	3.9749	3.9252	3.8902	3.8643	3.8442	3.8283
3	4.1528	4.0768	4.0111	3.9538	3.9034	3.8586	3.5893	3.4632	3.3901	3.3425	3.3089	3.2840	3.2648	3.2496
4	3.8042	3.7294	3.6647	3.6083	3.5587	3.5146	3.2499	3.1261	3.0544	3.0076	2.9747	2.9503	2.9315	2.9165
5	3.5764	3.5021	3.4379	3.3819	3.3327	3.2890	3.0264	2.9037	2.8326	2.7863	2.7537	2.7295	2.7108	2.6960
6	3.4146	3.3406	3.2766	3.2209	3.1718	3.1283	2.8666	2.7443	2.6735	2.6273	2.5948	2.5707	2.5521	2.5374
7	3.2933	3.2194	3.1555	3.0998	3.0508	3.0074	2.7460	2.6237	2.5529	2.5067	2.4742	2.4501	2.4315	2.4168
8	3.1987	3.1248	3.0609	3.0052	2.9562	2.9127	2.6512	2.5288	2.4579	2.4116	2.3791	2.3549	2.3362	2.3214
9	3.1227	3.0487	2.9848	2.9291	2.8800	2.8365	2.5746	2.4519	2.3808	2.3344	2.3017	2.2774	2.2587	2.2438
10	3.0601	2.9861	2.9221	2.8663	2.8172	2.7736	2.5111	2.3881	2.3167	2.2701	2.2373	2.2130	2.1942	2.1792
11	3.0078	2.9336	2.8696	2.8137	2.7645	2.7208	2.4577	2.3343	2.2626	2.2158	2.1828	2.1584	2.1395	2.1244
12	2.9632	2.8890	2.8248	2.7688	2.7195	2.6758	2.4120	2.2881	2.2162	2.1691	2.1360	2.1114	2.0924	2.0773
13	2.9249	2.8505	2.7862	2.7301	2.6807	2.6369	2.3724	2.2481	2.1758	2.1286	2.0953	2.0705	2.0514	2.0362
14	2.8914	2.8170	2.7526	2.6964	2.6469	2.6029	2.3377	2.2129	2.1404	2.0929	2.0594	2.0345	2.0153	2.0000
15	2.8620	2.7875	2.7230	2.6667	2.6171	2.5730	2.3071	2.1819	2.1090	2.0613	2.0276	2.0026	1.9833	1.9679
16	2.8360	2.7613	2.6967	2.6403	2.5906	2.5465	2.2798	2.1541	2.0809	2.0330	1.9992	1.9740	1.9546	1.9391
17	2.8127	2.7379	2.6733	2.6167	2.5669	2.5227	2.2554	2.1292	2.0557	2.0076	1.9736	1.9483	1.9287	1.9132
18	2.7919	2.7170	2.6522	2.5955	2.5457	2.5014	2.2333	2.1067	2.0329	1.9845	1.9504	1.9249	1.9053	1.8896
19	2.7730	2.6980	2.6331	2.5764	2.5264	2.4820	2.2133	2.0863	2.0122	1.9636	1.9292	1.9037	1.8839	1.8682
20	2.7559	2.6807	2.6157	2.5590	2.5089	2.4644	2.1951	2.0677	1.9932	1.9444	1.9099	1.8842	1.8643	1.8485
30	2.6437	2.5678	2.5020	2.4445	2.3937	2.3486	2.0739	1.9429	1.8659	1.8152	1.7792	1.7523	1.7314	1.7148
40	2.5850	2.5085	2.4422	2.3841	2.3329	2.2873	2.0088	1.8751	1.7962	1.7440	1.7068	1.6790	1.6574	1.6401
50	2.5487	2.4719	2.4052	2.3468	2.2952	2.2492	1.9680	1.8323	1.7519	1.6985	1.6604	1.6318	1.6095	1.5916
60	2.5242	2.4470	2.3801	2.3214	2.2695	2.2233	1.9400	1.8027	1.7211	1.6667	1.6279	1.5986	1.5758	1.5575
70	2.5064	2.4290	2.3618	2.3029	2.2509	2.2045	1.9195	1.7810	1.6984	1.6432	1.6037	1.5739	1.5507	1.5320
80	2.4929	2.4154	2.3480	2.2890	2.2367	2.1902	1.9038	1.7643	1.6809	1.6251	1.5851	1.5548	1.5312	1.5121
90	2.4824	2.4047	2.3372	2.2780	2.2256	2.1789	1.8915	1.7511	1.6671	1.6107	1.5702	1.5396	1.5156	1.4962
100	2.4739	2.3961	2.3285	2.2692	2.2167	2.1699	1.8815	1.7405	1.6558	1.5990	1.5581	1.5271	1.5028	1.4832



Tabelle A.6.  $(1 - \alpha)$ -Quantile  $f_{df_1, df_2, 1-\alpha}$  der  $F$ -Verteilung für  $\alpha = 0.01$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	4052.1	98.502	34.116	21.197	16.258	13.745	12.246	11.258	10.561	10.044	9.6460	9.3302	9.0738	8.8615
2	4999.5	99.000	30.816	18.000	13.273	10.924	9.5465	8.6491	8.0215	7.5994	7.2057	6.9266	6.7009	6.5148
3	5403.3	99.166	29.456	16.694	12.059	9.7795	8.4512	7.5909	6.9919	6.5523	6.2167	5.9525	5.7393	5.5638
4	5624.5	99.249	28.709	15.977	11.391	9.1483	7.8466	7.0060	6.4220	5.9943	5.6683	5.4119	5.2053	5.0353
5	5763.6	99.299	28.237	15.521	10.967	8.7458	7.4604	6.6318	6.0569	5.6363	5.3160	5.0643	4.8616	4.6949
6	5858.9	99.332	27.910	15.206	10.672	8.4661	7.1914	6.3706	5.8017	5.3858	5.0692	4.8205	4.6203	4.4558
7	5928.3	99.356	27.671	14.975	10.455	8.2599	6.9928	6.1776	5.6128	5.2001	4.8860	4.6395	4.4409	4.2778
8	5981.0	99.374	27.489	14.798	10.289	8.1016	6.8400	6.0288	5.4671	5.0566	4.7444	4.4993	4.3020	4.1399
9	6022.4	99.388	27.345	14.659	10.157	7.9761	6.7187	5.9106	5.3511	4.9424	4.6315	4.3875	4.1910	4.0296
10	6055.8	99.399	27.228	14.545	10.051	7.8741	6.6200	5.8142	5.2565	4.8491	4.5392	4.2960	4.1002	3.9393
11	6083.3	99.408	27.132	14.452	9.9626	7.7895	6.5381	5.7342	5.1778	4.7715	4.4624	4.2198	4.0245	3.8640
12	61106.3	99.415	27.051	14.373	9.8882	7.7183	6.4690	5.6667	5.1114	4.7058	4.3974	4.1552	3.9603	3.8001
13	6125.8	99.422	26.983	14.306	9.8248	7.6574	6.4100	5.6089	5.0545	4.6496	4.3416	4.0998	3.9052	3.7452
14	6142.6	99.427	26.923	14.248	9.7700	7.6048	6.3589	5.5588	5.0052	4.6008	4.2932	4.0517	3.8573	3.6975
15	6157.3	99.432	26.872	14.198	9.7222	7.5589	6.3143	5.5151	4.9620	4.5581	4.2508	4.0096	3.8153	3.6556
16	6170.1	99.436	26.826	14.153	9.6801	7.5185	6.2750	5.4765	4.9240	4.5204	4.2134	3.9723	3.7782	3.6186
17	6181.4	99.440	26.786	14.114	9.6428	7.4827	6.2400	5.4422	4.8901	4.4869	4.1801	3.9392	3.7451	3.5856
18	6191.5	99.443	26.750	14.079	9.6095	7.4506	6.2088	5.4116	4.8599	4.4569	4.1502	3.9094	3.7155	3.5561
19	6200.5	99.446	26.718	14.048	9.5796	7.4218	6.1808	5.3840	4.8326	4.4298	4.1233	3.8827	3.6888	3.5294
20	6208.7	99.449	26.689	14.019	9.5526	7.3958	6.1554	5.3590	4.8079	4.4053	4.0990	3.8584	3.6646	3.5052
30	6260.6	99.465	26.504	13.837	9.3793	7.2285	5.9920	5.1981	4.6485	4.2469	3.9411	3.7007	3.5070	3.3475
40	6286.7	99.474	26.410	13.745	9.2911	7.1432	5.9084	5.1156	4.5666	4.1652	3.8595	3.6191	3.4252	3.2656
50	6302.5	99.479	26.354	13.689	9.2378	7.0914	5.8576	5.0653	4.5167	4.1154	3.8097	3.5692	3.3751	3.2153
60	6313.0	99.482	26.316	13.652	9.2020	7.0567	5.8235	5.0316	4.4838	4.0818	3.7760	3.5354	3.3412	3.1812
70	6320.5	99.484	26.289	13.625	9.1763	7.0318	5.7990	5.0073	4.4588	4.0576	3.7518	3.5111	3.3168	3.1566
80	6326.1	99.486	26.268	13.605	9.1570	7.0130	5.7806	4.9890	4.4406	4.0394	3.7335	3.4927	3.2983	3.1380
90	6330.5	99.488	26.252	13.589	9.1419	6.9984	5.7662	4.9747	4.4264	4.0251	3.7192	3.4783	3.2839	3.1235
100	6334.1	99.489	26.240	13.576	9.1299	6.9866	5.7546	4.9632	4.4149	4.0137	3.7077	3.4668	3.2722	3.1118

Tabelle A.6.  $(1 - \alpha)$ -Quantile  $f_{df_1, df_2; 1 - \alpha}$  der  $F$ -Verteilung für  $\alpha = 0.01$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	15	16	17	18	19	20	30	40	50	60	70	80	90	100
1	8.6831	8.5309	8.3997	8.2854	8.1849	8.0959	7.5624	7.3140	7.1705	7.0771	7.0113	6.9626	6.9251	6.8953
2	6.3588	6.2262	6.1121	6.0129	5.9258	5.8489	5.3903	5.1785	5.0566	4.9774	4.9218	4.8807	4.8490	4.8239
3	5.4169	5.2922	5.1849	5.0918	5.0102	4.9381	4.5097	4.3125	4.1993	4.1258	4.0743	4.0362	4.0069	3.9836
4	4.8932	4.7725	4.6689	4.5790	4.5002	4.4306	4.0178	3.8282	3.7195	3.6490	3.5996	3.5631	3.5349	3.5126
5	4.5556	4.4374	4.3359	4.2478	4.1707	4.1026	3.6990	3.5138	3.4076	3.3388	3.2906	3.2550	3.2276	3.2058
6	4.3182	4.2016	4.1015	4.0146	3.9385	3.8714	3.4734	3.2910	3.1864	3.1186	3.0712	3.0361	3.0091	2.9876
7	4.1415	4.0259	3.9267	3.8406	3.7652	3.6987	3.3044	3.1237	3.0201	2.9530	2.9060	2.8712	2.8445	2.8232
8	4.0044	3.8895	3.7909	3.7054	3.6305	3.5644	3.1726	2.9929	2.8900	2.8232	2.7765	2.7419	2.7153	2.6942
9	3.8947	3.7804	3.6822	3.5970	3.5225	3.4566	3.0665	2.8875	2.7849	2.7184	2.6718	2.6373	2.6108	2.5898
10	3.8049	3.6909	3.5930	3.5081	3.4338	3.3681	2.9790	2.8005	2.6981	2.6317	2.5852	2.5508	2.5243	2.5033
11	3.7299	3.6161	3.5185	3.4337	3.3596	3.2941	2.9056	2.7273	2.6250	2.5586	2.5121	2.4777	2.4512	2.4302
12	3.6662	3.5526	3.4551	3.3706	3.2965	3.2311	2.8430	2.6648	2.5624	2.4961	2.4495	2.4151	2.3886	2.3675
13	3.6115	3.4980	3.4007	3.3162	3.2422	3.1768	2.7890	2.6107	2.5083	2.4418	2.3952	2.3607	2.3342	2.3131
14	3.5639	3.4506	3.3533	3.2688	3.1949	3.1295	2.7418	2.5634	2.4608	2.3943	2.3476	2.3131	2.2864	2.2653
15	3.5221	3.4089	3.3116	3.2272	3.1533	3.0880	2.7001	2.5216	2.4189	2.3522	2.3055	2.2708	2.2441	2.2230
16	3.4852	3.3720	3.2748	3.1904	3.1164	3.0511	2.6631	2.4844	2.3816	2.3147	2.2679	2.2331	2.2064	2.1851
17	3.4523	3.3391	3.2419	3.1575	3.0836	3.0182	2.6300	2.4510	2.3480	2.2811	2.2341	2.1992	2.1724	2.1511
18	3.4227	3.3095	3.2123	3.1280	3.0540	2.9887	2.6002	2.4210	2.3178	2.2506	2.2035	2.1686	2.1417	2.1203
19	3.3960	3.2829	3.1857	3.1013	3.0273	2.9620	2.5732	2.3937	2.2903	2.2230	2.1757	2.1407	2.1137	2.0922
20	3.3718	3.2587	3.1615	3.0770	3.0031	2.9377	2.5486	2.3688	2.2652	2.1978	2.1504	2.1152	2.0881	2.0666
30	3.2141	3.1007	3.0032	2.9185	2.8442	2.7784	2.3859	2.2033	2.0975	2.0284	1.9797	1.9435	1.9155	1.8932
40	3.1319	3.0182	2.9204	2.8354	2.7607	2.6947	2.2992	2.1142	2.0065	1.9366	1.8861	1.8489	1.8201	1.7971
50	3.0813	2.9674	2.8694	2.7841	2.7092	2.6429	2.2450	2.0581	1.9498	1.8771	1.8263	1.7883	1.7588	1.7352
60	3.0471	2.9330	2.8348	2.7493	2.6742	2.6077	2.2078	2.0194	1.9090	1.8362	1.7845	1.7458	1.7158	1.6917
70	3.0223	2.9081	2.8097	2.7240	2.6488	2.5821	2.1807	1.9910	1.8796	1.8060	1.7536	1.7144	1.6838	1.6593
80	3.0036	2.8893	2.7907	2.7049	2.6295	2.5627	2.1601	1.9693	1.8571	1.7828	1.7298	1.6900	1.6590	1.6342
90	2.9890	2.8745	2.7759	2.6899	2.6144	2.5475	2.1438	1.9522	1.8392	1.7643	1.7108	1.6706	1.6393	1.6141
100	2.9772	2.8626	2.7639	2.6779	2.6023	2.5353	2.1307	1.9383	1.8247	1.7493	1.6953	1.6548	1.6231	1.5976

Tabelle A.7.  $(1 - \alpha/2)$ -Quantile  $f_{df_1, df_2; 1-\alpha}$  der  $F$ -Verteilung für  $\alpha = 0.01/2$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	16210	198.50	55.551	31.332	22.784	18.634	16.235	14.688	13.613	12.826	12.226	11.754	11.373	11.060
2	19999	199.00	49.799	26.284	18.313	14.544	12.403	11.042	10.106	9.4269	8.9122	8.5096	8.1864	7.9216
3	21614	199.16	47.467	24.259	16.529	12.916	10.882	9.5964	8.7170	8.0807	7.6004	7.2257	6.9257	6.6803
4	22499	199.24	46.194	23.154	15.556	12.027	10.050	8.8051	7.9558	7.3428	6.8808	6.5211	6.2334	5.9984
5	23055	199.29	45.391	22.456	14.939	11.463	9.5220	8.3017	7.4711	6.8723	6.4217	6.0711	5.7909	5.5622
6	23437	199.33	44.838	21.974	14.513	11.073	9.1553	7.9519	7.1338	6.5446	6.1015	5.7570	5.4819	5.2573
7	23714	199.35	44.434	21.621	14.200	10.785	8.8553	7.6941	6.8849	6.3024	5.8647	5.5245	5.2529	5.0313
8	23925	199.37	44.125	21.351	13.960	10.565	8.6781	7.4959	6.6933	6.1159	5.6821	5.3450	5.0760	4.8566
9	24091	199.38	43.882	21.139	13.771	10.391	8.5138	7.3385	6.5410	5.9675	5.5367	5.2021	4.9350	4.7172
10	24224	199.39	43.685	20.966	13.618	10.250	8.3803	7.2106	6.4171	5.8466	5.4182	5.0854	4.8199	4.6033
11	24334	199.40	43.523	20.824	13.491	10.132	8.2696	7.1044	6.3142	5.7462	5.3196	4.9883	4.7240	4.5084
12	24426	199.41	43.387	20.704	13.384	10.034	8.1764	7.0149	6.2273	5.6613	5.2363	4.9062	4.6428	4.4281
13	24504	199.42	43.271	20.602	13.293	9.9501	8.0967	6.9383	6.1530	5.5886	5.1649	4.8358	4.5732	4.3591
14	24571	199.42	43.171	20.514	13.214	9.8774	8.0278	6.8721	6.0887	5.5257	5.1030	4.7747	4.5128	4.2992
15	24630	199.43	43.084	20.438	13.146	9.8139	7.9677	6.8142	6.0324	5.4706	5.0488	4.7213	4.4599	4.2468
16	24681	199.43	43.008	20.370	13.086	9.7581	7.9148	6.7632	5.9828	5.4220	5.0010	4.6741	4.4132	4.2004
17	24726	199.44	42.940	20.311	13.032	9.7086	7.8678	6.7180	5.9388	5.3789	4.9585	4.6321	4.3716	4.1591
18	24767	199.44	42.880	20.258	12.984	9.6644	7.8258	6.6775	5.8993	5.3402	4.9205	4.5945	4.3343	4.1221
19	24803	199.44	42.826	20.210	12.942	9.6246	7.7880	6.6411	5.8639	5.3054	4.8862	4.5606	4.3007	4.0887
20	24835	199.44	42.777	20.167	12.903	9.5887	7.7539	6.6082	5.8318	5.2740	4.8552	4.5299	4.2703	4.0585
30	25043	199.46	42.465	19.891	12.655	9.3582	7.5344	6.3960	5.6247	5.0705	4.6543	4.3309	4.0727	3.8619
40	25148	199.47	42.308	19.751	12.529	9.2408	7.4224	6.2875	5.5185	4.9659	4.5508	4.2281	3.9704	3.7599
50	25211	199.47	42.213	19.667	12.453	9.1696	7.3544	6.2215	5.4539	4.9021	4.4876	4.1653	3.9078	3.6975
60	25255	199.48	42.149	19.610	12.402	9.1219	7.3087	6.1771	5.4104	4.8591	4.4450	4.1239	3.8655	3.6552
70	25285	199.48	42.103	19.570	12.365	9.0876	7.2759	6.1453	5.3791	4.8282	4.4143	4.0923	3.8350	3.6247
80	25307	199.48	42.069	19.539	12.338	9.0619	7.2512	6.1212	5.3555	4.8049	4.3911	4.0692	3.8120	3.6017
90	25324	199.48	42.042	19.515	12.316	9.0418	7.2319	6.1025	5.3371	4.7867	4.3730	4.0512	3.7939	3.5836
100	25338	199.48	42.021	19.496	12.299	9.0256	7.2165	6.0875	5.3223	4.7721	4.3585	4.0367	3.7795	3.5692

Tabelle A.7.  $(1 - \alpha/2)$ -Quantile  $f_{df_1, df_2; 1-\alpha}$  der  $F$ -Verteilung für  $\alpha = 0.01/2$ .  $df_1$  in den Zeilen,  $df_2$  in den Spalten

$df_1$	$df_2$													
	15	16	17	18	19	20	30	40	50	60	70	80	90	100
1	10.798	10.575	10.384	10.218	10.072	9.9439	9.1796	8.8278	8.6257	8.4946	8.4026	8.3346	8.2822	8.2406
2	7.7007	7.5138	7.3536	7.2148	7.0934	6.9864	6.3546	6.0664	5.9016	5.7949	5.7203	5.6652	5.6228	5.5892
3	6.4720	6.3033	6.1556	6.0277	5.9160	5.8177	5.2387	4.9758	4.8258	4.7289	4.6612	4.6112	4.5728	4.5423
4	5.8029	5.6378	5.4966	5.3746	5.2680	5.1742	4.6233	4.3737	4.2316	4.1398	4.0758	4.0285	3.9921	3.9633
5	5.3721	5.2117	5.0745	4.9560	4.8526	4.7615	4.2275	3.9860	3.8486	3.7599	3.6980	3.6523	3.6172	3.5894
6	5.0708	4.9134	4.7789	4.6627	4.5613	4.4721	3.9492	3.7129	3.5785	3.4918	3.4313	3.3866	3.3523	3.3252
7	4.8472	4.6920	4.5593	4.4447	4.3448	4.2568	3.7415	3.5088	3.3764	3.2911	3.2315	3.1875	3.1538	3.1271
8	4.6743	4.5206	4.3893	4.2759	4.1770	4.0899	3.5800	3.3497	3.2188	3.1344	3.0755	3.0320	2.9986	2.9721
9	4.5363	4.3838	4.2535	4.1409	4.0428	3.9564	3.4504	3.2219	3.0920	3.0082	2.9497	2.9066	2.8734	2.8472
10	4.4235	4.2718	4.1423	4.0304	3.9328	3.8470	3.3439	3.1167	2.9875	2.9041	2.8459	2.8030	2.7700	2.7439
11	4.3294	4.1785	4.0495	3.9381	3.8410	3.7555	3.2547	3.0284	2.8996	2.8166	2.7586	2.7158	2.6829	2.6569
12	4.2497	4.0993	3.9708	3.8598	3.7630	3.6779	3.1787	2.9531	2.8247	2.7418	2.6839	2.6412	2.6084	2.5825
13	4.1813	4.0313	3.9032	3.7925	3.6960	3.6111	3.1132	2.8880	2.7598	2.6771	2.6193	2.5766	2.5439	2.5179
14	4.1218	3.9722	3.8444	3.7340	3.6377	3.5530	3.0560	2.8312	2.7031	2.6204	2.5627	2.5200	2.4873	2.4613
15	4.0697	3.9204	3.7929	3.6827	3.5865	3.5019	3.0057	2.7810	2.6531	2.5704	2.5126	2.4700	2.4372	2.4112
16	4.0237	3.8746	3.7472	3.6372	3.5412	3.4567	2.9610	2.7365	2.6085	2.5258	2.4681	2.4254	2.3926	2.3666
17	3.9826	3.8338	3.7066	3.5967	3.5008	3.4164	2.9211	2.6966	2.5686	2.4859	2.4280	2.3853	2.3525	2.3264
18	3.9458	3.7971	3.6701	3.5603	3.4645	3.3801	2.8851	2.6606	2.5326	2.4498	2.3919	2.3491	2.3162	2.2901
19	3.9126	3.7641	3.6371	3.5274	3.4317	3.3474	2.8526	2.6280	2.4999	2.4170	2.3591	2.3162	2.2833	2.2571
20	3.8825	3.7341	3.6073	3.4976	3.4020	3.3177	2.8230	2.5984	2.4701	2.3872	2.3291	2.2862	2.2532	2.2270
30	3.6867	3.5388	3.4124	3.3030	3.2075	3.1234	2.6277	2.4014	2.2716	2.1874	2.1282	2.0844	2.0507	2.0238
40	3.5849	3.4372	3.3107	3.2013	3.1057	3.0215	2.5240	2.2958	2.1644	2.0788	2.0186	1.9739	1.9394	1.9119
50	3.5225	3.3747	3.2482	3.1387	3.0430	2.9586	2.4594	2.2295	2.0967	2.0099	1.9488	1.9033	1.8680	1.8400
60	3.4802	3.3324	3.2058	3.0962	3.0003	2.9158	2.4151	2.1838	2.0498	1.9621	1.9001	1.8539	1.8181	1.7896
70	3.4497	3.3018	3.1751	3.0654	2.9695	2.8849	2.3829	2.1504	2.0154	1.9269	1.8642	1.8174	1.7811	1.7521
80	3.4266	3.2787	3.1519	3.0421	2.9461	2.8614	2.3583	2.1248	1.9890	1.8998	1.8365	1.7892	1.7524	1.7230
90	3.4086	3.2605	3.1337	3.0239	2.9278	2.8430	2.3390	2.1047	1.9681	1.8783	1.8145	1.7667	1.7296	1.6998
100	3.3940	3.2460	3.1191	3.0092	2.9130	2.8282	2.3234	2.0884	1.9512	1.8608	1.7965	1.7484	1.7109	1.6808

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