Таблицы критических значений

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Содержание

1 Функции для вычисления критических значений

Приведем список функции MS Excel, LibreOffice, R и Python для вычисления критических значений стандартных распределений с уровнем значимости α

Таблица 1: Функции для вычисления критических значений в табличных процессорах

Распределение	MS Excel 2007 (Рус) Numbers (Mac)	MS Excel 2010+ (Рус)	Google Таблицы MS Excel (Eng) LibreOffice
$\mathcal{N}(0,1)$ (гауссово)	НОРМСТОБР$(1-\alpha/2)$	НОРМ.СТ.ОБР$(1-\alpha/2)$	NORMSINV$(1-\alpha/2)$ NORM.S.INV$(1-\alpha/2)$
χ^2_{df} (хи-квадрат)	ХИ2ОБР$(\alpha; df)$	ХИ2.ОБР.ПХ$(\alpha; df)$	CHIINV$(\alpha; df)$ CHISQ.INV.RT$(\alpha; df)$
t_{df} (Стьюдента)	СТЬЮДРАСПОБР$(\alpha; df)$	СТЬЮДЕНТ.ОБР.2Х$(\alpha; df)$	TINV$(\alpha; df)$ T.INV.RT$(\alpha; df)$
$F_{df1,df2}$ (Фишера)	FРАСПОБР$(\alpha; df1; df2)$	F.ОБР.ПХ$(\alpha; df1; df2)$	FINV $(\alpha; df1; df2)$ F.INV.RT$(\alpha; df1; df2)$

Таблица 2: Функции для вычисления критических значений в R & Python

Распределение	R	Python (`scipy.stats`)
$\mathcal{N}(0,1)$ (гауссово)	`qnorm`$(p = 1 - \alpha/2)$	`.norm.ppf`$(p = 1 - \alpha/2)$
χ^2_{df} (хи-квадрат)	`qchisq`$(p = 1 - \alpha, df)$	`.chi2.ppf`$(p = 1 - \alpha, df)$
t_{df} (Стьюдента)	`qt`$(p = 1 - \alpha/2, df)$	`.t.ppf`$(p = 1 - \alpha/2, df)$
$F_{df1,df2}$ (Фишера)	`qf`$(p = 1 - \alpha; df1, df2)$	`.f.ppf`$(p = 1 - \alpha, dfd, dfn)$

2 Таблицы критических значений

Таблица 3: Критические значения стандартного нормального распределения

	Уровень значимости								
α	0.400	0.200	0.100	0.050	0.020	0.010	0.005	0.002	0.001
z_{cr}	0.842	1.282	1.645	1.960	2.326	2.576	2.807	3.090	3.291

Таблица 4: Критические значения распределения χ^2_{df}

	Уровень значимости α						
df	0.100	0.050	0.025	0.020	0.010	0.005	0.001
1	2.706	3.841	5.024	5.412	6.635	7.879	10,828
2	4.605	5.991	7.378	7.824	9.210	10.597	13.816
3	6.251	7.815	9.348	9.837	11.345	12.838	16.266
4	7.779	9.488	11.143	11.668	13.277	14.860	18.467
5	9.236	11.070	12.833	13.388	15.086	16.750	20.515
6	10.645	12.592	14.449	15.033	16.812	18.548	22.458
7	12.017	14.067	16.013	16.622	18.475	20.278	24.322
8	13.362	15.507	17.535	18.168	20.090	21.955	26.124
9	14.684	16.919	19.023	19.679	21.666	23.589	27.877
10	15.987	18.307	20.483	21.161	23.209	25.188	29.588
11	17.275	19.675	21.920	22.618	24.725	26.757	31.264
12	18.549	21.026	23.337	24.054	26.217	28.300	32.909
13	19.812	22.362	24.736	25.472	27.688	29.819	34.528
14	21.064	23.685	26.119	26.873	29.141	31.319	36.123
15	22.307	24.996	27.488	28.259	30.578	32.801	37.697
16	23.542	26.296	28.845	29.633	32.000	34.267	39.252
17	24.769	27.587	30.191	30.995	33.409	35.718	40.790
18	25.989	28.869	31.526	32.346	34.805	37.156	42.312
19	27.204	30.144	32.852	33.687	36.191	38.582	43.820
21	29.615	32.671	35.479	36.343	38.932	41.401	46.797
22	30.813	33.924	36.781	37.659	40.289	42.796	48.268
23	32.007	35.172	38.076	38.968	41.638	44.181	49.728
24	33.196	36.415	39.364	40.270	42.980	45.559	51.179
25	34.382	37.652	40.646	41.566	44.314	46.928	52.620
30	40.256	43.773	46.979	47.962	50.892	53.672	59.703
40	51.805	55.758	59.342	60.436	63.691	66.766	73.402
50	63.167	67.505	71.420	72.613	76.154	79.490	86.661
60	74.397	79.082	83.298	84.580	88.379	91.952	99.607
70	85.527	90.531	95.023	96.388	100.425	104.215	112.317
80	96.578	101.879	106.629	108.069	112.329	116.321	124.839
90	107.565	113.145	118.136	119.648	124.116	128.299	137.208
100	118.498	124.342	129.561	131.142	135.807	140.169	149.449

Таблица 5: Критические значения распределения t_{df} (распределения Стьюдента)

	Уровень значимости α					
df	0.100	0.050	0.025	0.010	0.005	0.001
1	6.314	12.706	25.452	63.657	127.321	636.619
2	2.920	4.303	6.205	9.925	14.089	31.599
3	2.353	3.182	4.177	5.841	7.453	12.924
4	2.132	2.776	3.495	4.604	5.598	8.610
5	2.015	2.571	3.163	4.032	4.773	6.869
6	1.943	2.447	2.969	3.707	4.317	5.959
7	1.895	2.365	2.841	3.499	4.029	5.408
8	1.860	2.306	2.752	3.355	3.833	5.041
9	1.833	2.262	2.685	3.250	3.690	4.781
10	1.812	2.228	2.634	3.169	3.581	4.587
11	1.796	2.201	2.593	3.106	3.497	4.437
12	1.782	2.179	2.560	3.055	3.428	4.318
13	1.771	2.160	2.533	3.012	3.372	4.221
14	1.761	2.145	2.510	2.977	3.326	4.140
15	1.753	2.131	2.490	2.947	3.286	4.073
16	1.746	2.120	2.473	2.921	3.252	4.015
17	1.740	2.110	2.458	2.898	3.222	3.965
18	1.734	2.101	2.445	2.878	3.197	3.922
19	1.729	2.093	2.433	2.861	3.174	3.883
20	1.725	2.086	2.423	2.845	3.153	3.850
21	1.721	2.080	2.414	2.831	3.135	3.819
22	1.717	2.074	2.405	2.819	3.119	3.792
23	1.714	2.069	2.398	2.807	3.104	3.768
24	1.711	2.064	2.391	2.797	3.091	3.745
25	1.708	2.060	2.385	2.787	3.078	3.725
26	1.706	2.056	2.379	2.779	3.067	3.707
27	1.703	2.052	2.373	2.771	3.057	3.690
28	1.701	2.048	2.368	2.763	3.047	3.674
29	1.699	2.045	2.364	2.756	3.038	3.659
30	1.697	2.042	2.360	2.750	3.030	3.646
40	1.684	2.021	2.329	2.704	2.971	3.551
50	1.676	2.009	2.311	2.678	2.937	3.496
60	1.671	2.000	2.299	2.660	2.915	3.460
70	1.667	1.994	2.291	2.648	2.899	3.435
80	1.664	1.990	2.284	2.639	2.887	3.416
90	1.662	1.987	2.280	2.632	2.878	3.402
100	1.660	1.984	2.276	2.626	2.871	3.390
120	1.658	1.980	2.270	2.617	2.860	3.373
200	1.653	1.972	2.258	2.601	2.839	3.340
300	1.650	1.968	2.253	2.592	2.828	3.323
500	1.648	1.965	2.248	2.586	2.820	3.310
∞	1.645	1.960	2.2416	2.576	2.807	3.291

Таблица 6: 5% критические значения распределения $F_{df1,df2}$ (распределения Фишера)

	$df1$									
$df2$	1	2	3	4	5	6	7	8	9	10
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371	19.385	19.396
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.786
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438	3.388	3.347
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948	2.896	2.854
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849	2.796	2.753
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767	2.714	2.671
14	4.600	3.739	3.344	3.112	2.958	2.848	2.764	2.699	2.646	2,602
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641	2.588	2.544
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657	2.591	2.538	2.494
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614	2.548	2.494	2.450
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577	2.510	2.456	2.412
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544	2.477	2.423	2.378
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447	2.393	2.348
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488	2.420	2.366	2.321
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464	2.397	2.342	2.297
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442	2.375	2.320	2.275
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423	2.355	2.300	2.255
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337	2.282	2.236
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388	2.321	2.265	2.220
27	4.210	3.354	2,960	2.728	2.572	2.459	2.373	2.305	2.250	2.204
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359	2.291	2.236	2.190
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346	2.278	2.223	2.177
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266	2.211	2.165
40	4.085	3.232	2.839	2.606	2.449	2.336	2.249	2.180	2.124	2.077
50	4.034	3.183	2.790	2.557	2.400	2.286	2.199	2.130	2.073	2.026
60	4.001	3.150	2.758	2.525	2.368	2.254	2.167	2.097	2.040	1.993
100	3.936	3.087	2.696	2.463	2.305	2.191	2.103	2.032	1.975	1.927
120	3.920	3.072	2.680	2.447	2.290	2.175	2.087	2.016	1.959	1.910
500	3.860	3.014	2.623	2.390	2.232	2.117	2.028	1.957	1.899	1.850
∞	3.841	2.996	2.605	2.372	2.214	2.099	2.010	1.938	1.880	1.831

Таблица 7: 5% критические значения распределения $F_{df1,df2}$ (распределения Фишера)

	$df1$								
$df2$	15	20	25	30	40	50	60	100	120
2	19.429	19.446	19.456	19.462	19.471	19.476	19.479	19.486	19.487
3	8.703	8.660	8.634	8.617	8.594	8.581	8.572	8.554	8.549
4	5.858	5.803	5.769	5.746	5.717	5.699	5.688	5.664	5.658
5	4.619	4.558	4.521	4.496	4.464	4.444	4.431	4.405	4.398
6	3.938	3.874	3.835	3.808	3.774	3.754	3.740	3.712	3.705
7	3.511	3.445	3.404	3.376	3.340	3.319	3.304	3.275	3.267
8	3.218	3.150	3.108	3.079	3.043	3.020	3.005	2.975	2.967
9	3.006	2.936	2.893	2.864	2.826	2.803	2.787	2.756	2.748
10	2.845	2.774	2.730	2.700	2.661	2.637	2.621	2.588	2.580
11	2.719	2.646	2.601	2.570	2.531	2.507	2.490	2.457	2.448
12	2.617	2.544	2.498	2.466	2.426	2.401	2.384	2.350	2.341
13	2.533	2.459	2.412	2.380	2.339	2.314	2.297	2.261	2.252
14	2.463	2.388	2.341	2.308	2.266	2.241	2.223	2.187	2.178
15	2.403	2.328	2.280	2.247	2.204	2.178	2.160	2.123	2.114
16	2.352	2.276	2.227	2.194	2.151	2.124	2.106	2.068	2.059
17	2.308	2.230	2.181	2.148	2.104	2.077	2.058	2.020	2.011
18	2.269	2.191	2.141	2.107	2.063	2.035	2.017	1.978	1.968
19	2.234	2.155	2.106	2.071	2.026	1.999	1.980	1.940	1.930
20	2.203	2.124	2.074	2.039	1.994	1.966	1.946	1.907	1.896
21	2.176	2.096	2.045	2.010	1.965	1.936	1.916	1.876	1.866
22	2.151	2.071	2.020	1.984	1.938	1.909	1.889	1.849	1.838
23	2.128	2.048	1.996	1.961	1.914	1.885	1.865	1.823	1.813
24	2.108	2.027	1.975	1.939	1.892	1.863	1.842	1.800	1.790
25	2.089	2.007	1.955	1.919	1.872	1.842	1.822	1.779	1.768
26	2.072	1.990	1.938	1.901	1.853	1.823	1.803	1.760	1.749
27	2.056	1.974	1.921	1.884	1.836	1.806	1.785	1.742	1.731
28	2.041	1.959	1.906	1.869	1.820	1.790	1.769	1.725	1.714
29	2.027	1.945	1.891	1.854	1.806	1.775	1.754	1.710	1.698
30	2.015	1.932	1.878	1.841	1.792	1.761	1.740	1.695	1.683
40	1.924	1.839	1.783	1.744	1.693	1.660	1.637	1.589	1.577
50	1.871	1.784	1.727	1.687	1.634	1.599	1.576	1.525	1.511
60	1.836	1.748	1.690	1.649	1.594	1.559	1.534	1.481	1.467
100	1.768	1.676	1.616	1.573	1.515	1.477	1.450	1.392	1.376
120	1.750	1.659	1.598	1.554	1.495	1.457	1.429	1.369	1.352
500	1.686	1.592	1.528	1.482	1.419	1.376	1.345	1.275	1.255
∞	1.666	1.571	1.506	1.459	1.394	1.350	1.318	1.243	1.221

Таблица 8: 10% критические значения распределения $F_{df1,df2}$ (распределения Фишера)

	$df1$									
$df2$	1	2	3	4	5	6	7	8	9	10
2	8.526	9.000	9.162	9.243	9.293	9.326	9.349	9.367	9.381	9.392
3	5.538	5.462	5.391	5.343	5.309	5.285	5.266	5.252	5.240	5.230
4	4.545	4.325	4.191	4.107	4.051	4.010	3.979	3.955	3.936	3.920
5	4.060	3.780	3.619	3.520	3.453	3.405	3.368	3.339	3.316	3.297
6	3.776	3.463	3.289	3.181	3.108	3.055	3.014	2.983	2.958	2.937
7	3.589	3.257	3.074	2.961	2.883	2.827	2.785	2.752	2.725	2.703
8	3.458	3.113	2.924	2.806	2.726	2.668	2.624	2.589	2.561	2.538
9	3.360	3.006	2.813	2.693	2.611	2.551	2.505	2.469	2.440	2.416
10	3.285	2.924	2.728	2.605	2.522	2.461	2.414	2.377	2.347	2.323
11	3.225	2.860	2.660	2.536	2.451	2.389	2.342	2.304	2.274	2.248
12	3.177	2.807	2.606	2.480	2.394	2.331	2.283	2.245	2.214	2.188
13	3.136	2.763	2.560	2.434	2.347	2.283	2.234	2.195	2.164	2.138
14	3.102	2.726	2.522	2.395	2.307	2.243	2.193	2.154	2.122	2.095
15	3.073	2.695	2.490	2.361	2.273	2.208	2.158	2.119	2.086	2.059
16	3.048	2.668	2.462	2.333	2.244	2.178	2.128	2.088	2.055	2.028
17	3.026	2.645	2.437	2.308	2.218	2.152	2.102	2.061	2.028	2.001
18	3.007	2.624	2.416	2.286	2.196	2.130	2.079	2.038	2.005	1.977
19	2.990	2.606	2.397	2.266	2.176	2.109	2.058	2.017	1.984	17956
20	2.975	2.589	2.380	2.249	2.158	2.091	2.040	1.999	1.965	1.937
21	2.961	2.575	2.365	2.233	2.142	2.075	2.023	1.982	1.948	1.920
22	2.949	2.561	2.351	2.219	2.128	2.060	2.008	1.967	1.933	1.904
23	2.937	2.549	2.339	2.207	2.115	2.047	1.995	1.953	1.919	1.890
24	2.927	2.538	2.327	2.195	2.103	2.035	1.983	1.941	1.906	1.877
25	2.918	2.528	2.317	2.184	2.092	2.024	1.971	1.929	1.895	1.866
26	2.909	2.519	2.307	2.174	2.082	2.014	1.961	1.919	1.884	1.855
27	2.901	2.511	2.299	2.165	2.073	2.005	1.952	1.909	1.874	1.845
28	2.894	2.503	2.291	2.157	2.064	1.996	1.943	1.900	1.865	1.836
29	2.887	2.495	2.283	2.149	2.057	1.988	1.935	1.892	1.857	1.827
30	2.881	2.489	2.276	2.142	2.049	1.980	1.927	1.884	1.849	1.819
40	2.835	2.440	2.226	2.091	1.997	1.927	1.873	1.829	1.793	1.763
50	2.809	2.412	2.197	2.061	1.966	1.895	1.840	1.796	1.760	1.729
60	2.791	2.393	2.177	2.041	1.946	1.875	1.819	1.775	1.738	1.707
100	2.756	2.356	2.139	2.002	1.906	1.834	1.778	1.732	1.695	1.663
120	2.748	2.347	2.130	1.992	1.896	1.824	1.767	1.722	1.684	1.652
500	2.716	2.313	2.095	1.956	1.859	1.786	1.729	1.683	1.644	1.612
∞	2.706	2.303	2.084	1.945	1.847	1.774	1.717	1.670	1.632	1.599

Таблица 9: 10% критические значения распределения $F_{df1,df2}$ (распределения Фишера)

	$df1$								
$df2$	15	20	25	30	40	50	60	100	120
2	9.425	9.441	9.451	9.458	9.466	9.471	9.475	9.481	9.483
3	5.200	5.184	5.175	5.168	5.160	5.155	5.151	5.144	5.143
4	3.870	3.844	3.828	3.817	3.804	3.795	3.790	3.778	3.775
5	3.238	3.207	3.187	3.174	3.157	3.147	3.140	3.126	3.123
6	2.871	2.836	2.815	2.800	2.781	2.770	2.762	2.746	2,742
7	2.632	2.595	2.571	2.555	2.535	2.523	2.514	2.497	2.493
8	2.464	2.425	2.400	2.383	2.361	2.348	2.339	2.321	2.316
9	2.340	2.298	2.272	2.255	2.232	2.218	2.208	2.189	2.184
10	2.244	2.201	2.174	2.155	2.132	2.117	2.107	2.087	2.082
11	2.167	2.123	2.095	2.076	2.052	2.036	2.026	2.005	2.000
12	2.105	2.060	2.031	2.011	1.986	1.970	1.960	1.938	1.932
13	2.053	2.007	1.978	1.958	1.931	1.915	1.904	1.882	1.876
14	2.010	1.962	1.933	1.912	1.885	1.869	1.857	1.834	1.828
15	1.972	1.924	1.894	1.873	1.845	1.828	1.817	1.793	1.787
16	1.940	1.891	1.860	1.839	1.811	1.793	1.782	1.757	1.751
17	1.912	1.862	1.831	1.809	1.781	1.763	1.751	1.726	1.719
18	1.887	1.837	1.805	1.783	1.754	1.736	1.723	1.698	1.691
19	1.865	1.814	1.782	1.759	1.730	1.711	1.699	1.673	1.666
20	1.845	1.794	1.761	1.738	1.708	1.690	1.677	1.650	1.643
21	1.827	1.776	1.742	1.719	1.689	1.670	1.657	1.630	1.623
22	1.811	1.759	1.726	1.702	1.671	1.652	1.639	1.611	1.604
23	1.796	1.744	1.710	1.686	1.655	1.636	1.622	1.594	1.587
24	1.783	1.730	1.696	1.672	1.641	1.621	1.607	1.579	1.571
25	1.771	1.718	1.683	1.659	1.627	1.607	1.593	1.565	1.557
26	1.760	1.706	1.671	1.647	1.615	1.594	1.581	1.551	1.544
27	1.749	1.695	1.660	1.636	1.603	1.583	1.569	1.539	1.531
28	1.740	1.685	1.650	1.625	1.592	1.572	1.558	1.528	1.520
29	1.731	1.676	1.640	1.616	1.583	1.562	1.547	1.517	1.509
30	1.722	1.667	1.632	1.606	1.573	1.552	1.538	1.507	1.499
40	1.662	1.605	1.568	1.541	1.506	1.483	1.467	1.434	1.425
50	1.627	1.568	1.529	1.502	1.465	1.441	1.424	1.388	1.379
60	1.603	1.543	1.504	1.476	1.437	1.413	1.395	1.358	1.348
100	1.557	1.494	1.453	1.423	1.382	1.355	1.336	1.293	1.282
120	1.545	1.482	1.440	1.409	1.368	1.340	1.320	1.277	1.265
500	1.501	1.435	1.391	1.358	1.313	1.282	1.260	1.209	1.194
∞	1.487	1.421	1.375	1.342	1.295	1.263	1.240	1.185	1.169

Таблица 10: 1% критические значения распределения $F_{df1,df2}$ (распределения Фишера)

	$df1$									
$df2$	1	2	3	4	5	6	7	8	9	10
2	98.503	99.000	99.166	99.249	99.299	99.333	99.356	99.374	99.388	99.399
3	34.116	30.817	29.457	28.710	28.237	27.911	27.672	27.489	27.345	27.229
4	21.198	18.000	16.694	15.977	15.522	15.207	14.976	14.799	14.659	14.546
5	16.258	13.274	12.060	11.392	10.967	10.672	10.456	10.289	10.158	10.051
6	13.745	10.925	9.780	9.148	8.746	8.466	8.260	8.102	7.976	7.874
7	12.246	9.547	8.451	7.847	7.460	7.191	6.993	6.840	6.719	6.620
8	11.259	8.649	7.591	7.006	6.632	6.371	6.178	6.029	5.911	5.814
9	10.561	8.022	6.992	6.422	6.057	5.802	5.613	5.467	5.351	5.257
10	10.044	7.559	6.552	5.994	5.636	5.386	5.200	5.057	4.942	4.849
11	9.646	7.206	6.217	5.668	5.316	5.069	4.886	4.744	4.632	4.539
12	9.330	6.927	5.953	5.412	5.064	4.821	4.640	4.499	4.388	4.296
13	9.074	6.701	5.739	5.205	4.862	4.620	4.441	4.302	4.191	4.100
14	8.862	6.515	5.564	5.035	4.695	4.456	4.278	4.140	4.030	3.939
15	8.683	6.359	5.417	4.893	4.556	4.318	4.142	4.004	3.895	3.805
16	8.531	6.226	5.292	4.773	4.437	4.202	4.026	3.890	3.780	3.691
17	8.400	6.112	5.185	4.669	4.336	4.102	3.927	3.791	3.682	3.593
18	8.285	6.013	5.092	4.579	4.248	4.015	3.841	3.705	3.597	3.508
19	8.185	5.926	5.010	4.500	4.171	3.939	3.765	3.631	3.523	3.434
20	8.096	5.849	4.938	4.431	4.103	3.871	3.699	3.564	3.457	3.368
21	8.017	5.780	4.874	4.369	4.042	3.812	3.640	3.506	3.398	3.310
22	7.945	5.719	4.817	4.313	3.988	3.758	3.587	3.453	3.346	3.258
23	7.881	5.664	4.765	4.264	3.939	3.710	3.539	3.406	3.299	3.211
24	7.823	5.614	4.718	4.218	3.895	3.667	3.496	3.363	3.256	3.168
25	7.770	5.568	4.675	4.177	3.855	3.627	3.457	3.324	3.217	3.129
26	7.721	5.526	4.637	4.140	3.818	3.591	3.421	3.288	3.182	3.094
27	7.677	5.488	4.601	4.106	3.785	3.558	3.388	3.256	3.149	3.062
28	7.636	5.453	4.568	4.074	3.754	3.528	3.358	3.226	3.120	3.032
29	7.598	5.420	4.538	4.045	3.725	3.499	3.330	3.198	3.092	3.005
30	7.562	5.390	4.510	4.018	3.699	3.473	3.304	3.173	3.067	2.979
40	7.314	5.179	4.313	3.828	3.514	3.291	3.124	2.993	2.888	2.801
50	7.171	5.057	4.199	3.720	3.408	3.186	3.020	2.890	2.785	2.698
60	7.077	4.977	4.126	3.649	3.339	3.119	2.953	2.823	2.718	2.632
100	6.895	4.824	3.984	3.513	3.206	2.988	2.823	2.694	2.590	2.503
120	6.851	4.787	3.949	3.480	3.174	2.956	2.792	2.663	2.559	2.472
500	6.686	4.648	3.821	3.357	3.054	2.838	2.675	2.547	2.443	2.356
∞	6.635	4.605	3.782	3.319	3.017	2.802	2.639	2.511	2.407	2.321

Таблица 11: 1% критические значения распределения $F_{df1,df2}$ (распределения Фишера)

	$df1$								
$df2$	15	20	25	30	40	50	60	100	120
2	99.433	99.449	99.459	99.466	99.474	99.479	99.482	99.489	99.491
3	26.872	26.690	26.579	26,505	26.411	26.354	26.316	26.240	26.221
4	14.198	14.020	13.911	13.838	13.745	13.690	13.652	13.577	13.558
5	9.722	9.553	9.449	9.379	9.291	9.238	9.202	9.130	9.112
6	7.559	7.396	7.296	7.229	7.143	7.091	7.057	6.987	6.969
7	6.314	6.155	6.058	5.992	5.908	5.858	5.824	5.755	5.737
8	5.515	5.359	5.263	5.198	5.116	5.065	5.032	4.963	4.946
9	4.962	4.808	4.713	4.649	4.567	4.517	4.483	4.415	4.398
10	4558	4.405	4.311	4.247	4.165	4.115	4.082	4.014	3.996
11	4.251	4.099	4.005	3.941	3.860	3.810	3.776	3.708	3.690
12	4.010	3.858	3.765	3.701	3.619	3.569	3.535	3.467	3.449
13	3.815	3.665	3.571	3.507	3.425	3.375	3.341	3.272	3.255
14	3.656	3.505	3.412	3.348	3.266	3.215	3.181	3,112	3.094
15	3.522	3.372	3.278	3.214	3.132	3.081	3.047	2.977	2.959
16	3.409	3.259	3.165	3.101	3.018	2.967	2.933	2.863	2.845
17	3.312	3.162	3.068	3.003	2.920	2.869	2.835	2.764	2.746
18	3.227	3.077	2.983	2.919	2.835	2.784	2.749	2.678	2.660
19	3.153	3.003	2.909	2.844	2.761	2.709	2.674	2.602	2.584
20	3.088	2.938	2.843	2.778	2.695	2.643	2.608	2.535	2.517
21	3.030	2.880	2.785	2.720	2.636	2.584	2.548	2.475	2.457
22	2.978	2.827	2.733	2.667	2.583	2.531	2.495	2.422	2.403
23	2.931	2.781	2.686	2.620	2.535	2.483	2.447	2.373	2.354
24	2.889	2.738	2.643	2.577	2.492	2.440	2.403	2.329	2.310
25	2.850	2.699	2.604	2.538	2.453	2.400	2.364	2.289	2.270
26	2.815	2.664	2.569	2.503	2.417	2.364	2.327	2.252	2.233
27	2.783	2.632	2.536	2.470	2.384	2.330	2.294	2.218	2.198
28	2.753	2.602	2.506	2.440	2.354	2.300	2.263	2.187	2.167
29	2.726	2.574	2.478	2,412	2,325	2,271	2.234	2.158	2,138
30	2.700	2.549	2.453	2.386	2.299	2.245	2.208	2.131	2.111
40	2.522	2.369	2.271	2.203	2.114	2.058	2.019	1.938	1.917
50	2.419	2.265	2.167	2.098	2.007	1.949	1.909	1.825	1.803
60	2.352	2.198	2.098	2.028	1.936	1.877	1.836	1.749	1.726
100	2.223	2.067	1.965	1.893	1.797	1.735	1.692	1.598	1.572
120	2.192	2.035	1.932	1.860	1.763	1.700	1.656	1.559	1.533
500	2.075	1.915	1.810	1.735	1.633	1.566	1.517	1.408	1.377
∞	2.039	1.878	1.773	1.696	1.592	1.523	1.473	1.358	1.325

Таблица 12: 1% критические значения теста Durbin–Watson

	k=1		k=2		k=3		k=4		k=5	
n	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU
6	0.390	1.142	—	—	—	—	—	—	—	—
7	0.435	1.036	0.294	1.676	—	—	—	—	—	—
8	0.497	1.003	0.345	1.489	0.229	2.102	—	—	—	—
9	0.554	0.998	0.408	1.389	0.279	1.875	0.183	2.433	—	—
10	0.604	1.001	0.466	1.333	0.340	1.733	0.230	2.193	0.150	2.690
11	0.653	1.010	0.519	1.297	0.396	1.640	0.286	2.030	0.193	2.453
12	0.697	1.023	0.569	1.274	0.449	1.575	0.339	1.913	0.244	2.280
13	0.738	1.038	0.616	1.261	0.499	1.526	0.391	1.826	0.294	2.150
14	0.776	1.054	0.660	1.254	0.547	1.490	0.441	1.757	0.343	2.049
15	0.811	1.070	0.700	1.252	0.591	1.465	0.487	1.705	0.390	1.967
16	0.844	1.086	0.738	1.253	0.633	1.447	0.532	1.664	0.437	1.901
17	0.873	1.102	0.773	1.255	0.672	1.432	0.574	1.631	0.481	1.847
18	0.902	1.118	0.805	1.259	0.708	1.422	0.614	1.604	0.522	1.803
19	0.928	1.133	0.835	1.264	0.742	1.416	0.650	1.583	0.561	1.767
20	0.952	1.147	0.862	1.270	0.774	1.410	0.684	1.567	0.598	1.736
21	0.975	1.161	0.889	1.276	0.803	1.408	0.718	1.554	0.634	1.712
22	0.997	1.174	0.915	1.284	0.832	1.407	0.748	1.543	0.666	1.691
23	1.017	1.186	0.938	1.290	0.858	1.407	0.777	1.535	0.699	1.674
24	1.037	1.199	0.959	1.298	0.881	1.407	0.805	1.527	0.728	1.659
25	1.055	1.210	0.981	1.305	0.906	1.408	0.832	1.521	0.756	1.645
26	1.072	1.222	1.000	1.311	0.928	1.410	0.855	1.517	0.782	1.635
27	1.088	1.232	1.019	1.318	0.948	1.413	0.878	1.514	0.808	1.625
28	1.104	1.244	1.036	1.325	0.969	1.414	0.901	1.512	0.832	1.618
29	1.119	1.254	1.053	1.332	0.988	1.418	0.921	1.511	0.855	1.611
30	1.134	1.264	1.070	1.339	1.006	1.421	0.941	1.510	0.877	1.606
31	1.147	1.274	1.085	1.345	1.022	1.425	0.960	1.509	0.897	1.601
32	1.160	1.283	1.100	1.351	1.039	1.428	0.978	1.509	0.917	1.597
33	1.171	1.291	1.114	1.358	1.055	1.432	0.995	1.510	0.935	1.594
34	1.184	1.298	1.128	1.364	1.070	1.436	1.012	1.511	0.954	1.591
35	1.195	1.307	1.141	1.370	1.085	1.439	1.028	1.512	0.971	1.589
36	1.205	1.315	1.153	1.376	1.098	1.442	1.043	1.513	0.987	1.587
37	1.217	1.322	1.164	1.383	1.112	1.446	1.058	1.514	1.004	1.585
38	1.227	1.330	1.176	1.388	1.124	1.449	1.072	1.515	1.019	1.584
39	1.237	1.337	1.187	1.392	1.137	1.452	1.085	1.517	1.033	1.583
40	1.246	1.344	1.197	1.398	1.149	1.456	1.098	1.518	1.047	1.583
45	1.288	1.376	1.245	1.424	1.201	1.474	1.156	1.528	1.111	1.583
50	1.324	1.403	1.285	1.445	1.245	1.491	1.206	1.537	1.164	1.587
55	1.356	1.428	1.320	1.466	1.284	1.505	1.246	1.548	1.209	1.592
60	1.382	1.449	1.351	1.484	1.317	1.520	1.283	1.559	1.248	1.598
65	1.407	1.467	1.377	1.500	1.346	1.534	1.314	1.568	1.283	1.604
70	1.429	1.485	1.400	1.514	1.372	1.546	1.343	1.577	1.313	1.611
75	1.448	1.501	1.422	1.529	1.395	1.557	1.368	1.586	1.340	1.617
80	1.465	1.514	1.440	1.541	1.416	1.568	1.390	1.595	1.364	1.624
85	1.481	1.529	1.458	1.553	1.434	1.577	1.411	1.603	1.386	1.630
90	1.496	1.541	1.474	1.563	1.452	1.587	1.429	1.611	1.406	1.636
95	1.510	1.552	1.489	1.573	1.468	1.596	1.446	1.618	1.425	1.641
100	1.522	1.562	1.502	1.582	1.482	1.604	1.461	1.625	1.441	1.647
150	1.611	1.637	1.598	1.651	1.584	1.665	1.571	1.679	1.557	1.693
200	1.664	1.684	1.653	1.693	1.643	1.704	1.633	1.715	1.623	1.725

Таблица 13: 1% критические значения теста Durbin–Watson

	k=6		k=7		k=8		k=9		k=10	
n	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU
6	—	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—
11	0.124	2.892	—	—	—	—	—	—	—	—
12	0.164	2.665	0.105	3.053	—	—	—	—	—	—
13	0.211	2.490	0.140	2.838	0.090	3.182	—	—	—	—
14	0.257	2.354	0.183	2.667	0.122	2.981	0.078	3.287	—	—
15	0.303	2.244	0.226	2.530	0.161	2.817	0.107	3.101	0.068	3.374
16	0.349	2.153	0.269	2.416	0.200	2.681	0.142	2.944	0.094	3.201
17	0.393	2.078	0.313	2.319	0.241	2.566	0.179	2.811	0.127	3.053
18	0.435	2.015	0.355	2.238	0.282	2.467	0.216	2.697	0.160	2.925
19	0.476	1.963	0.396	2.169	0.322	2.381	0.255	2.597	0.196	2.813
20	0.515	1.918	0.436	2.110	0.362	2.308	0.294	2.510	0.232	2.174
21	0.552	1.881	0.474	2.059	0.400	2.244	0.331	2.434	0.268	2.625
22	0.587	1.849	0.510	2.015	0.437	2.188	0.368	2.367	0.304	2.548
23	0.620	1.821	0.545	1.977	0.473	2.140	0.404	2.308	0.340	2.479
24	0.652	1.797	0.578	1.944	0.507	2.097	0.439	2.255	0.375	2.417
25	0.682	1.776	0.610	1.915	0.540	2.059	0.473	2.209	0.409	2.362
26	0.711	1.759	0.640	1.889	0.572	2.026	0.505	2.168	0.441	2.313
27	0.738	1.743	0.669	1.867	0.602	1.997	0.536	2.131	0.473	2.269
28	0.764	1.729	0.696	1.847	0.630	1.970	0.566	2.098	0.504	2.229
29	0.788	1.718	0.723	1.830	0.658	1.947	0.595	2.068	0.533	2.193
30	0.812	1.707	0.748	1.814	0.684	1.925	0.622	2.041	0.562	2.160
31	0.834	1.698	0.772	1.800	0.710	1.906	0.649	2.017	0.589	2.131
32	0.856	1.690	0.794	1.788	0.734	1.889	0.674	1.995	0.615	2.104
33	0.876	1.683	0.816	1.776	0.757	1.874	0.698	1.975	0.641	2.080
34	0.896	1.677	0.837	1.766	0.779	1.860	0.722	1.957	0.665	2.057
35	0.914	1.671	0.857	1.757	0.800	1.847	0.744	1.940	0.689	2.037
36	0.932	1.666	0.877	1.749	0.821	1.836	0.766	1.925	0.711	2.018
37	0.950	1.662	0.895	1.742	0.841	1.825	0.787	1.911	0.733	2.001
38	0.966	1.658	0.913	1.735	0.860	1.816	0.807	1.899	0.754	1.985
39	0.982	1.655	0.930	1.729	0.878	1.807	0.826	1.887	0.774	1.970
40	0.997	1.652	0.946	1.724	0.895	1.799	0.844	1.876	0.749	1.956
45	1.065	1.643	1.019	1.704	0.974	1.768	0.927	1.834	0.881	1.902
50	1.123	1.639	1.081	1.692	1.039	1.748	0.997	1.805	0.955	1.864
55	1.172	1.638	1.134	1.685	1.095	1.734	1.057	1.785	1.018	1.837
60	1.214	1.639	1.179	1.682	1.144	1.726	1.108	1.771	1.072	1.817
65	1.251	1.642	1.218	1.680	1.186	1.720	1.153	1.761	1.120	1.802
70	1.283	1.645	1.253	1.680	1.223	1.716	1.192	1.754	1.162	1.792
75	1.313	1.649	1.284	1.682	1.256	1.714	1.227	1.748	1.199	1.783
80	1.338	1.653	1.312	1.683	1.285	1.714	1.259	1.745	1.232	1.777
85	1.362	1.657	1.337	1.685	1.312	1.714	1.287	1.743	1.262	1.773
90	1.383	1.661	1.360	1.687	1.336	1.714	1.312	1.741	1.288	1.769
95	1.403	1.666	1.381	1.690	1.358	1.715	1.336	1.741	1.313	1.767
100	1.421	1.670	1.400	1.693	1.378	1.717	1.357	1.741	1.335	1.765
150	1.543	1.708	1.530	1.722	1.515	1.737	1.501	1.752	1.486	1.767
200	1.613	1.735	1.603	1.746	1.592	1.757	1.582	1.768	1.571	1.779

Таблица 14: 5% критические значения теста Durbin–Watson

	k=1		k=2		k=3		k=4		k=5	
n	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU
6	0.610	1.400	—	—	—	—	—	—	—	—
7	0.700	1.356	0.467	1.896	—	—	—	—	—	—
8	0.763	1.332	0.559	1.777	0.367	2.287	—	—	—	—
9	0.824	1.320	0.629	1.699	0.455	2.128	0.296	2.588	—	—
10	0.879	1.320	0.697	1.641	0.525	2.016	0.376	2.414	0.243	2.822
11	0.927	1.324	0.758	1.604	0.595	1.928	0.444	2.283	0.315	2.645
12	0.971	1.331	0.812	1.579	0.658	1.864	0.512	2.177	0.380	2.506
13	1.010	1.340	0.861	1.562	0.715	1.816	0.574	2.094	0.444	2.390
14	1.045	1.350	0.905	1.551	0.767	1.779	0.632	2.030	0.505	2.29
15	1.077	1.361	0.946	1.543	0.814	1.750	0.685	1.977	0.562	2.220
16	1.106	1.371	0.982	1.539	0.857	1.728	0.734	1.935	0.615	2.157
17	1.133	1.381	1.015	1.536	0.897	1.710	0.779	1.900	0.664	2.104
18	1.158	1.391	1.046	1.535	0.933	1.696	0.820	1.872	0.710	2.060
19	1.180	1.401	1.074	1.536	0.967	1.685	0.859	1.848	0.752	2.023
20	1.201	1.411	1.100	1.537	0.998	1.676	0.894	1.828	0.792	1.991
21	1.221	1.420	1.125	1.538	1.026	1.669	0.927	1.812	0.829	1.964
22	1.239	1.429	1.147	1.541	1.053	1.664	0.958	1.797	0.863	1.940
23	1.257	1.437	1.168	1.543	1.078	1.660	0.986	1.785	0.895	1.920
24	1.273	1.446	1.188	1.546	1.101	1.656	1.013	1.775	0.925	1.902
25	1.288	1.454	1.206	1.550	1.123	1.654	1.038	1.767	0.953	1.886
26	1.302	1.461	1.224	1.553	1.143	1.652	1.062	1.759	0.979	1.873
27	1.316	1.469	1.240	1.556	1.162	1.651	1.084	1.753	1.004	1.861
28	1.328	1.476	1.255	1.560	1.181	1.650	1.104	1.747	1.028	1.850
29	1.341	1.483	1.270	1.563	1.198	1.650	1.124	1.743	1.050	1.841
30	1.352	1.489	1.284	1.567	1.214	1.650	1.143	1.739	1.071	1.833
31	1.363	1.496	1.297	1.570	1.229	1.650	1.160	1.735	1.090	1.825
32	1.373	1.502	1.309	1.574	1.244	1.650	1.177	1.732	1.109	1.819
33	1.383	1.508	1.321	1.577	1.258	1.651	1.193	1.730	1.127	1.813
34	1.393	1.514	1.333	1.580	1.271	1.652	1.208	1.728	1.144	1.808
35	1.402	1.519	1.343	1.584	1.283	1.653	1.222	1.726	1.160	1.803
36	1.411	1.525	1.354	1.587	1.295	1.654	1.236	1.724	1.175	1.799
37	1.419	1.530	1.364	1.590	1.307	1.655	1.249	1.723	1.190	1.795
38	1.427	1.535	1.373	1.594	1.318	1.656	1.261	1.722	1.204	1.792
39	1.435	1.540	1.382	1.597	1.328	1.658	1.273	1.722	1.218	1.789
40	1.442	1.544	1.391	1.600	1.338	1.659	1.285	1.721	1.230	1.786
45	1.475	1.566	1.430	1.615	1.383	1.666	1.336	1.720	1.287	1.776
50	1.503	1.585	1.462	1.628	1.421	1.674	1.378	1.721	1.335	1.771
55	1.528	1.601	1.490	1.641	1.452	1.681	1.414	1.724	1.374	1.768
60	1.549	1.616	1.514	1.652	1.480	1.689	1.444	1.727	1.408	1.767
65	1.567	1.629	1.536	1.662	1.503	1.696	1.471	1.731	1.438	1.767
70	1.583	1.641	1.554	1.672	1.525	1.703	1.494	1.735	1.464	1.768
75	1.598	1.652	1.571	1.680	1.543	1.709	1.515	1.739	1.487	1.770
80	1.611	1.662	1.586	1.688	1.560	1.715	1.534	1.743	1.507	1.772
85	1.624	1.671	1.600	1.696	1.575	1.721	1.550	1.747	1.525	1.774
90	1.635	1.679	1.612	1.703	1.589	1.726	1.566	1.751	1.542	1.776
95	1.645	1.687	1.623	1.709	1.602	1.732	1.579	1.755	1.557	1.778
100	1.654	1.694	1.634	1.715	1.613	1.736	1.592	1.758	1.571	1.780
150	1.720	1.747	1.706	1.760	1.693	1.774	1.679	1.788	1.665	1.802
200	1.758	1.779	1.748	1.789	1.738	1.799	1.728	1.809	1.718	1.820

Таблица 15: 5% критические значения теста Durbin–Watson

	k=6		k=7		k=8		k=9		k=10	
n	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU
6	—	—	—	—	—	—	—	—	—	—
7	—	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—
9	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—
11	0.203	3.004	—	—	—	—	—	—	—	—
12	0.268	2.832	0.171	3.149	—	—	—	—	—	—
13	0.328	2.692	0.230	2.985	0.147	3.266	—	—	—	—
14	0.389	2.572	0.286	2.848	0.200	3.111	0.127	3.360	—	—
15	0.447	2.471	0.343	2.727	0.251	2.979	0.175	3.216	0.111	3.438
16	0.502	2.388	0.398	2.624	0.304	2.860	0.222	3.090	0.155	3.304
17	0.554	2.318	0.451	2.537	0.356	2.757	0.272	2.975	0.198	3.184
18	0.603	2.258	0.502	2.461	0.407	2.668	0.321	2.873	0.244	3.073
19	0.649	2.206	0.549	2.396	0.456	2.589	0.369	2.783	0.290	2.974
20	0.691	2.162	0.595	2.339	0.502	2.521	0.416	2.704	0.336	2.885
21	0.731	2.124	0.637	2.290	0.546	2.461	0.461	2.633	0.380	2.806
22	0.769	2.090	0.677	2.246	0.588	2.407	0.504	2.571	0.424	2.735
23	0.804	2.061	0.715	2.208	0.628	2.360	0.545	2.514	0.465	2.670
24	0.837	2.035	0.750	2.174	0.666	2.318	0.584	2.464	0.506	2.613
25	0.868	2.013	0.784	2.144	0.702	2.280	0.621	2.419	0.544	2.560
26	0.897	1.992	0.816	2.117	0.735	2.246	0.657	2.379	0.581	2.513
27	0.925	1.974	0.845	2.093	0.767	2.216	0.691	2.342	0.616	2.470
28	0.951	1.959	0.874	2.071	0.798	2.188	0.723	2.309	0.649	2.431
29	0.975	1.944	0.900	2.052	0.826	2.164	0.753	2.278	0.681	2.396
30	0.998	1.931	0.926	2.034	0.854	2.141	0.782	2.251	0.712	2.363
31	1.020	1.920	0.950	2.018	0.879	2.120	0.810	2.226	0.741	2.333
32	1.041	1.909	0.972	2.004	0.904	2.102	0.836	2.203	0.769	2.306
33	1.061	1.900	0.994	1.991	0.927	2.085	0.861	2.181	0.796	2.281
34	1.079	1.891	1.015	1.978	0.950	2.069	0.885	2.162	0.821	2.257
35	1.097	1.884	1.034	1.967	0.971	2.054	0.908	2.144	0.845	2.236
36	1.114	1.876	1.053	1.957	0.991	2.041	0.930	2.127	0.868	2.216
37	1.131	1.870	1.071	1.948	1.011	2.029	0.951	2.112	0.891	2.197
38	1.146	1.864	1.088	1.939	1.029	2.017	0.970	2.098	0.912	2.180
39	1.161	1.859	1.104	1.932	1.047	2.007	0.990	2.085	0.932	2.164
40	1.175	1.854	1.120	1.924	1.064	1.997	1.008	2.072	0.952	2.149
45	1.238	1.835	1.189	1.895	1.139	1.958	1.089	2.022	1.038	2.088
50	1.291	1.822	1.246	1.875	1.201	1.930	1.156	1.986	1.110	2.044
55	1.334	1.814	1.294	1.861	1.253	1.909	1.212	1.959	1.170	2.010
60	1.372	1.808	1.335	1.850	1.298	1.894	1.260	1.939	1.222	1.984
65	1.404	1.805	1.370	1.843	1.336	1.882	1.301	1.923	1.266	1.964
70	1.433	1.802	1.401	1.838	1.369	1.874	1.337	1.910	1.305	1.948
75	1.458	1.801	1.428	1.834	1.399	1.867	1.369	1.901	1.339	1.935
80	1.480	1.801	1.453	1.831	1.425	1.861	1.397	1.893	1.369	1.925
85	1.500	1.801	1.474	1.829	1.448	1.857	1.422	1.886	1.396	1.916
90	1.518	1.801	1.494	1.827	1.469	1.854	1.445	1.881	1.420	1.909
95	1.535	1.802	1.512	1.827	1.489	1.852	1.465	1.877	1.442	1.903
100	1.550	1.803	1.528	1.826	1.506	1.850	1.484	1.874	1.462	1.898
150	1.651	1.817	1.637	1.832	1.622	1.846	1.608	1.862	1.593	1.877
200	1.707	1.831	1.697	1.841	1.686	1.852	1.675	1.863	1.665	1.874