

15.5: Appendix E- The F-Tables

The tables show the critical values for a simple independent-groups ANOVA.

When using repeated-measures ANOVA, use df_e in place of df_w .

When using ANOVA as part of a regression, use df_M in place of df_b and df_e in place of df_w .

When using $\alpha = 0.05$, use standard values.

When using $\alpha = 0.01$, use bolded values.

Degrees of Freedom Between (df_b)									
Degrees of Freedom Within (df_w)		1	2	3	4	5	6	7	8
1		161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.883
		4052.181	4999.500	5403.352	5624.583	5763.650	5858.986	5928.356	5981.070
2		18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371
		98.503	99.000	99.166	99.249	99.299	99.333	99.356	99.374
3		10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845
		34.116	30.817	29.457	28.710	28.237	27.911	27.672	27.489
4		7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041
		21.198	18.000	16.694	15.977	15.522	15.207	14.976	14.799
5		6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818
		16.258	13.274	12.060	11.392	10.967	10.672	10.456	10.289
6		5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147
		13.745	10.925	9.780	9.148	8.746	8.466	8.260	8.102
7		5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726
		12.246	9.547	8.451	7.847	7.460	7.191	6.993	6.840
8		5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438
		11.259	8.649	7.591	7.006	6.632	6.371	6.178	6.029
9		5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230
		10.561	8.022	6.992	6.422	6.057	5.802	5.613	5.467
10		4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072
		10.044	7.559	6.552	5.994	5.636	5.386	5.200	5.057
11		4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948
		9.646	7.206	6.217	5.668	5.316	5.069	4.886	4.744
12		4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849
		9.330	6.927	5.953	5.412	5.064	4.821	4.640	4.499
13		4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767
		9.074	6.701	5.739	5.205	4.862	4.620	4.441	4.302
14		4.600	3.739	3.344	3.112	2.958	2.848	2.764	2.699

Degrees of Freedom Between (df_b)								
	8.862	6.515	5.564	5.035	4.695	4.456	4.278	4.140
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641
	8.683	6.359	5.417	4.893	4.556	4.318	4.142	4.004
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657	2.591
	8.531	6.226	5.292	4.773	4.437	4.202	4.026	3.890
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614	2.548
	8.400	6.112	5.185	4.669	4.336	4.102	3.927	3.791
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577	2.510
	8.285	6.013	5.092	4.579	4.248	4.015	3.841	3.705
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544	2.477
	8.185	5.926	5.010	4.500	4.171	3.939	3.765	3.631
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447
	8.096	5.849	4.938	4.431	4.103	3.871	3.699	3.564
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488	2.420
	8.017	5.780	4.874	4.369	4.042	3.812	3.640	3.506
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464	2.397
	7.945	5.719	4.817	4.313	3.988	3.758	3.587	3.453
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442	2.375
	7.881	5.664	4.765	4.264	3.939	3.710	3.539	3.406
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423	2.355
	7.823	5.614	4.718	4.218	3.895	3.667	3.496	3.363
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337
	7.770	5.568	4.675	4.177	3.855	3.627	3.457	3.324
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388	2.321
	7.721	5.526	4.637	4.140	3.818	3.591	3.421	3.288
27	4.210	3.354	2.960	2.728	2.572	2.459	2.373	2.305
	7.677	5.488	4.601	4.106	3.785	3.558	3.388	3.256
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359	2.291
	7.636	5.453	4.568	4.074	3.754	3.528	3.358	3.226
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346	2.278
	7.598	5.420	4.538	4.045	3.725	3.499	3.330	3.198
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266
	7.562	5.390	4.510	4.018	3.699	3.473	3.304	3.173
31	4.160	3.305	2.911	2.679	2.523	2.409	2.323	2.255

Degrees of Freedom Between (df_b)								
	7.530	5.362	4.484	3.993	3.675	3.449	3.281	3.149
32	4.149	3.295	2.901	2.668	2.512	2.399	2.313	2.244
	7.499	5.336	4.459	3.969	3.652	3.427	3.258	3.127
33	4.139	3.285	2.892	2.659	2.503	2.389	2.303	2.235
	7.471	5.312	4.437	3.948	3.630	3.406	3.238	3.106
34	4.130	3.276	2.883	2.650	2.494	2.380	2.294	2.225
	7.444	5.289	4.416	3.927	3.611	3.386	3.218	3.087
35	4.121	3.267	2.874	2.641	2.485	2.372	2.285	2.217
	7.419	5.268	4.396	3.908	3.592	3.368	3.200	3.069
36	4.113	3.259	2.866	2.634	2.477	2.364	2.277	2.209
	7.396	5.248	4.377	3.890	3.574	3.351	3.183	3.052
37	4.105	3.252	2.859	2.626	2.470	2.356	2.270	2.201
	7.373	5.229	4.360	3.873	3.558	3.334	3.167	3.036
38	4.098	3.245	2.852	2.619	2.463	2.349	2.262	2.194
	7.353	5.211	4.343	3.858	3.542	3.319	3.152	3.021
39	4.091	3.238	2.845	2.612	2.456	2.342	2.255	2.187
	7.333	5.194	4.327	3.843	3.528	3.305	3.137	3.006
40	4.085	3.232	2.839	2.606	2.449	2.336	2.249	2.180
	7.314	5.179	4.313	3.828	3.514	3.291	3.124	2.993
41	4.079	3.226	2.833	2.600	2.443	2.330	2.243	2.174
	7.296	5.163	4.299	3.815	3.501	3.278	3.111	2.980
42	4.073	3.220	2.827	2.594	2.438	2.324	2.237	2.168
	7.280	5.149	4.285	3.802	3.488	3.266	3.099	2.968
43	4.067	3.214	2.822	2.589	2.432	2.318	2.232	2.163
	7.264	5.136	4.273	3.790	3.476	3.254	3.087	2.957
44	4.062	3.209	2.816	2.584	2.427	2.313	2.226	2.157
	7.248	5.123	4.261	3.778	3.465	3.243	3.076	2.946
45	4.057	3.204	2.812	2.579	2.422	2.308	2.221	2.152
	7.234	5.110	4.249	3.767	3.454	3.232	3.066	2.935
46	4.052	3.200	2.807	2.574	2.417	2.304	2.216	2.147
	7.220	5.099	4.238	3.757	3.444	3.222	3.056	2.925
47	4.047	3.195	2.802	2.570	2.413	2.299	2.212	2.143
	7.207	5.087	4.228	3.747	3.434	3.213	3.046	2.916
48	4.043	3.191	2.798	2.565	2.409	2.295	2.207	2.138

Degrees of Freedom Between (df_b)								
	7.194	5.077	4.218	3.737	3.425	3.204	3.037	2.907
49	4.038	3.187	2.794	2.561	2.404	2.290	2.203	2.134
	7.182	5.066	4.208	3.728	3.416	3.195	3.028	2.898
50	4.034	3.183	2.790	2.557	2.400	2.286	2.199	2.130
	7.171	5.057	4.199	3.720	3.408	3.186	3.020	2.890
51	4.030	3.179	2.786	2.553	2.397	2.283	2.195	2.126
	7.159	5.047	4.191	3.711	3.400	3.178	3.012	2.882
52	4.027	3.175	2.783	2.550	2.393	2.279	2.192	2.122
	7.149	5.038	4.182	3.703	3.392	3.171	3.005	2.874
53	4.023	3.172	2.779	2.546	2.389	2.275	2.188	2.119
	7.139	5.030	4.174	3.695	3.384	3.163	2.997	2.867
54	4.020	3.168	2.776	2.543	2.386	2.272	2.185	2.115
	7.129	5.021	4.167	3.688	3.377	3.156	2.990	2.860
55	4.016	3.165	2.773	2.540	2.383	2.269	2.181	2.112
	7.119	5.013	4.159	3.681	3.370	3.149	2.983	2.853
56	4.013	3.162	2.769	2.537	2.380	2.266	2.178	2.109
	7.110	5.006	4.152	3.674	3.363	3.143	2.977	2.847
57	4.010	3.159	2.766	2.534	2.377	2.263	2.175	2.106
	7.102	4.998	4.145	3.667	3.357	3.136	2.971	2.841
58	4.007	3.156	2.764	2.531	2.374	2.260	2.172	2.103
	7.093	4.991	4.138	3.661	3.351	3.130	2.965	2.835
59	4.004	3.153	2.761	2.528	2.371	2.257	2.169	2.100
	7.085	4.984	4.132	3.655	3.345	3.124	2.959	2.829
60	4.001	3.150	2.758	2.525	2.368	2.254	2.167	2.097
	7.077	4.977	4.126	3.649	3.339	3.119	2.953	2.823
61	3.998	3.148	2.755	2.523	2.366	2.251	2.164	2.094
	7.070	4.971	4.120	3.643	3.333	3.113	2.948	2.818
62	3.996	3.145	2.753	2.520	2.363	2.249	2.161	2.092
	7.062	4.965	4.114	3.638	3.328	3.108	2.942	2.813
63	3.993	3.143	2.751	2.518	2.361	2.246	2.159	2.089
	7.055	4.959	4.109	3.632	3.323	3.103	2.937	2.808
64	3.991	3.140	2.748	2.515	2.358	2.244	2.156	2.087
	7.048	4.953	4.103	3.627	3.318	3.098	2.932	2.803
65	3.989	3.138	2.746	2.513	2.356	2.242	2.154	2.084

Degrees of Freedom Between (df_b)								
	7.042	4.947	4.098	3.622	3.313	3.093	2.928	2.798
66	3.986	3.136	2.744	2.511	2.354	2.239	2.152	2.082
	7.035	4.942	4.093	3.618	3.308	3.088	2.923	2.793
67	3.984	3.134	2.742	2.509	2.352	2.237	2.150	2.080
	7.029	4.937	4.088	3.613	3.304	3.084	2.919	2.789
68	3.982	3.132	2.740	2.507	2.350	2.235	2.148	2.078
	7.023	4.932	4.083	3.608	3.299	3.080	2.914	2.785
69	3.980	3.130	2.737	2.505	2.348	2.233	2.145	2.076
	7.017	4.927	4.079	3.604	3.295	3.075	2.910	2.781
70	3.978	3.128	2.736	2.503	2.346	2.231	2.143	2.074
	7.011	4.922	4.074	3.600	3.291	3.071	2.906	2.777
71	3.976	3.126	2.734	2.501	2.344	2.229	2.142	2.072
	7.006	4.917	4.070	3.596	3.287	3.067	2.902	2.773
72	3.974	3.124	2.732	2.499	2.342	2.227	2.140	2.070
	7.001	4.913	4.066	3.591	3.283	3.063	2.898	2.769
73	3.972	3.122	2.730	2.497	2.340	2.226	2.138	2.068
	6.995	4.908	4.062	3.588	3.279	3.060	2.895	2.765
74	3.970	3.120	2.728	2.495	2.338	2.224	2.136	2.066
	6.990	4.904	4.058	3.584	3.275	3.056	2.891	2.762
75	3.968	3.119	2.727	2.494	2.337	2.222	2.134	2.064
	6.985	4.900	4.054	3.580	3.272	3.052	2.887	2.758
76	3.967	3.117	2.725	2.492	2.335	2.220	2.133	2.063
	6.981	4.896	4.050	3.577	3.268	3.049	2.884	2.755
77	3.965	3.115	2.723	2.490	2.333	2.219	2.131	2.061
	6.976	4.892	4.047	3.573	3.265	3.046	2.881	2.751
78	3.963	3.114	2.722	2.489	2.332	2.217	2.129	2.059
	6.971	4.888	4.043	3.570	3.261	3.042	2.877	2.748
79	3.962	3.112	2.720	2.487	2.330	2.216	2.128	2.058
	6.967	4.884	4.040	3.566	3.258	3.039	2.874	2.745
80	3.960	3.111	2.719	2.486	2.329	2.214	2.126	2.056
	6.963	4.881	4.036	3.563	3.255	3.036	2.871	2.742

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