

Lampiran 1 : Nilai Kritis Statistik Uji Friedman (χ_r^2)

Distribusi eksak χ_r^2 untuk tabel-tabel dengan dua hingga sembilan kumpulan tiga buah peringkat ($k = 3, n = 2, 3, 4, 5, 6, 7, 8, 9$)

p adalah peluang untuk mendapatkan suatu harga χ_r^2 sebesar atau lebih besar dari harga χ_r^2 yang bersangkutan

$n = 2$		$n = 3$		$n = 4$		$n = 5$	
χ_r^2	p	χ_r^2	p	χ_r^2	p	χ_r^2	p
0	1.000	0.000	1.000	0.0	1.000	0.0	1.000
1	0.833	0.667	0.944	0.5	0.931	0.4	0.954
3	0.500	2.000	0.528	1.5	0.653	1.2	0.691
4	0.167	2.667	0.361	2.0	0.431	1.6	0.522
		4.667	0.104	3.5	0.273	2.8	0.367
		6.000	0.028	4.5	0.125	3.6	0.182
				6.0	0.069	4.8	0.124
				6.5	0.042	5.2	0.093
				8.0	0.0046	6.4	0.039
						7.6	0.024
						8.4	0.0085
						10.0	0.00077
$n = 6$		$n = 7$		$n = 8$		$n = 9$	
χ_r^2	p	χ_r^2	p	χ_r^2	p	χ_r^2	p
0.00	1.000	0.000	1.000	0.00	1.000	0.000	1.000
0.33	0.956	0.286	0.964	0.25	0.967	0.222	0.971
1.00	0.740	0.857	0.768	0.75	0.794	0.667	0.814
1.33	0.570	1.143	0.620	1.00	0.654	0.889	0.865
2.33	0.430	2.000	0.486	1.75	0.531	1.556	0.569
3.00	0.252	2.571	0.305	2.25	0.355	2.000	0.398
4.00	0.184	3.429	0.237	3.00	0.285	2.667	0.328
4.33	0.142	3.714	0.192	3.25	0.236	2.889	0.278
5.33	0.072	4.571	0.112	4.00	0.149	3.556	0.187
6.33	0.052	5.429	0.085	4.75	0.120	4.222	0.154
7.00	0.029	6.000	0.052	5.25	0.079	4.667	0.107
8.33	0.012	7.143	0.027	6.25	0.047	5.556	0.069
9.00	0.0081	7.714	0.021	6.75	0.038	6.000	0.057
9.33	0.0055	8.000	0.016	7.00	0.030	6.222	0.048
10.33	0.0017	8.857	0.0084	7.75	0.018	6.889	0.031
12.00	0.00013	10.286	0.0036	9.00	0.0099	8.000	0.019
		10.571	0.0027	9.25	0.0080	8.222	0.016
		11.143	0.0012	9.75	0.0048	8.667	0.010
		12.286	0.00032	10.75	0.0024	9.556	0.0060
		14.000	0.000021	12.00	0.0011	10.667	0.0035
				12.25	0.00086	10.889	0.0029
				13.00	0.00026	11.556	0.0013
				14.25	0.000061	12.667	0.00066
				16.00	0.0000035	13.556	0.00035
						14.000	0.00020
						14.222	0.000097
						14.889	0.000054
						16.222	0.000011
						18.000	0.0000006

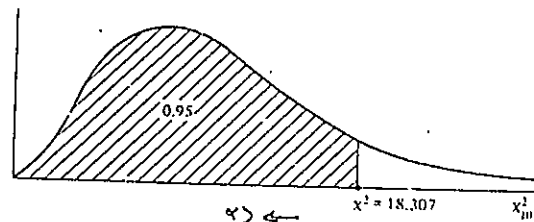
Sumber: M. Friedman, "The Use of Ranks to Avoid the Assumption of Normality Implicit in the Analysis of Variance," *J. Amer. Statist. Assoc.*, 32 (1937), 675-701

Distribusi eksak X_r^2 untuk tabel-tabel dengan dua hingga empat kumpulan empat buah peringkat ($k = 4, n = 2, 3, 4$)

p adalah peluang untuk mendapatkan suatu harga X_r^2 sebesar atau lebih besar dari harga X_r^2 yang bersangkutan

$n = 2$		$n = 3$		$n = 4$			
x_r^2	p	x_r^2	p	x_r^2	p	x_r^2	p
0.0	1.000	0.2	1.000	0.0	1.000	5.7	0.141
0.6	0.958	0.6	0.958	0.3	0.992	6.0	0.105
1.2	0.834	1.0	0.910	0.6	0.928	6.3	0.094
1.8	0.792	1.8	0.727	0.9	0.900	6.6	0.077
2.4	0.625	2.2	0.608	1.2	0.800	6.9	0.068
3.0	0.542	2.6	0.524	1.5	0.754	7.2	0.054
3.6	0.458	3.4	0.446	1.8	0.677	7.5	0.052
4.2	0.375	3.8	0.342	2.1	0.649	7.8	0.036
4.8	0.208	4.2	0.300	2.4	0.524	8.1	0.033
5.4	0.167	5.0	0.207	2.7	0.508	8.4	0.019
6.0	0.042	5.4	0.175	3.0	0.432	8.7	0.014
		5.8	0.148	3.3	0.389	9.3	0.012
		6.6	0.075	3.6	0.355	9.6	0.0069
		7.0	0.054	3.9	0.324	9.9	0.0062
		7.4	0.033	4.5	0.242	10.2	0.0027
		8.2	0.017	4.8	0.200	10.8	0.0016
		9.0	0.0017	5.1	0.190	11.1	0.00094
				5.4	0.158	12.0	0.000072

Lampiran 2 : Distribusi Chi-Kuadrat

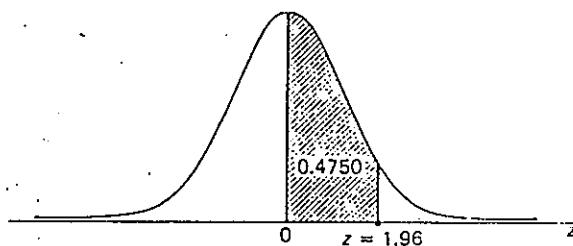


df	$\chi^2_{0.005}$	$\chi^2_{0.025}$	$\chi^2_{0.05}$	$\chi^2_{0.50}$	$\chi^2_{0.95}$	$\chi^2_{0.975}$	$\chi^2_{0.99}$	$\chi^2_{0.995}$
1	0.0000393	0.000982	0.00393	2.706	3.841	5.024	6.635	7.879
2	0.0100	0.0506	0.103	4.605	5.991	7.378	9.210	10.597
3	0.0717	0.216	0.352	6.251	7.815	9.348	11.345	12.838
4	0.207	0.484	0.711	7.779	9.488	11.143	13.277	14.860
5	0.412	0.831	1.145	9.236	11.070	12.832	15.086	16.750
6	0.676	1.237	1.635	10.645	12.592	14.449	16.812	18.548
7	0.989	1.690	2.167	12.017	14.067	16.013	18.475	20.278
8	1.344	2.180	2.733	13.362	15.507	17.535	20.090	21.955
9	1.735	2.700	3.325	14.684	16.919	19.023	21.666	23.589
10	2.156	3.247	3.940	15.987	18.307	20.483	23.209	25.188
11	2.603	3.816	4.575	17.275	19.675	21.920	24.725	26.757
12	3.074	4.404	5.226	18.549	21.026	23.336	26.217	28.300
13	3.565	5.009	5.892	19.812	22.362	24.736	27.688	29.819
14	4.075	5.629	6.571	21.064	23.685	26.119	29.141	31.319
15	4.601	6.262	7.261	22.307	24.996	27.488	30.578	32.801
16	5.142	6.908	7.962	23.542	26.296	28.845	32.000	34.267
17	5.697	7.564	8.672	24.769	27.587	30.191	33.409	35.718
18	6.266	8.231	9.390	25.989	28.869	31.526	34.805	37.156
19	6.844	8.907	10.117	27.204	30.144	32.852	36.191	38.582
20	7.434	9.591	10.851	28.412	31.410	34.170	37.566	39.997
21	8.034	10.283	11.591	29.615	32.671	35.479	38.932	41.401
22	8.643	10.982	12.338	30.813	33.924	36.781	40.289	42.796
23	9.260	11.688	13.091	32.007	35.172	38.076	41.638	44.181
24	9.886	12.401	13.848	33.196	36.415	39.364	42.980	45.558
25	10.520	13.120	14.611	34.382	37.652	40.646	44.314	46.928
26	11.160	13.844	15.379	35.563	38.885	41.923	45.642	48.290
27	11.808	14.573	16.151	36.741	40.113	43.194	46.963	49.645
28	12.461	15.308	16.928	37.916	41.337	44.461	48.278	50.993
29	13.121	16.047	17.708	39.087	42.557	45.722	49.588	52.336
30	13.787	16.791	18.493	40.256	43.773	46.979	50.892	53.672
35	17.192	20.569	22.465	46.059	49.802	53.203	57.342	60.275
40	20.707	24.433	26.509	51.805	55.758	59.342	63.691	66.766
45	24.311	28.366	30.612	57.505	61.656	65.410	69.357	73.166
50	27.991	32.357	34.764	63.167	67.505	71.420	76.154	79.490
60	35.535	40.482	43.188	74.397	79.082	83.298	88.379	91.952
70	43.275	48.758	51.739	85.527	90.531	95.023	100.425	104.215
80	51.172	57.153	60.391	96.578	101.879	106.629	112.329	116.321
90	59.198	65.647	69.126	107.565	113.145	118.136	124.116	128.299
100	67.328	74.222	77.929	118.498	124.342	129.561	135.807	140.169

Sumber: A. Hald and S. A. Sinkbaek, "A Table of Percentage Points of the χ^2 Distribution," *Skandinavisk Aktuarietidskrift*, 33 (1950), 168-175. Digunakan dengan izin.

Lampiran 3 : Distribusi normal Standart

Luas kurva normal. (Entry-entry dalam batang tubuh tabel ini menyajikan luas daerah di bawah kurva normal standar dari 0 hingga z.)



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Sumber: John E. Freund and Frank J. Williams, *Elementary Business Statistics; The Modern Approach*, second edition, 1972; dicetak ulang dengan izin dari Prentice-Hall, Inc., Englewood Cliffs, N.J.

Lampiran 4 : Harga Kuantil ρ II QUANTILES OF THE SPEARMAN TEST STATISTIC^a

n	$\rho = .900$.950	.975	.990	.995	.999
4	.8000	.8000				
5	.7000	.8000	.9000	.9000		
6	.6000	.7714	.8286	.8857	.9429	
7	.5357	.6786	.7450	.8571	.8929	.9643
8	.5000	.6190	.7143	.8095	.8571	.9286
9	.4667	.5833	.6833	.7667	.8167	.9000
10	.4424	.5515	.6364	.7333	.7818	.8667
11	.4182	.5273	.6091	.7000	.7455	.8364
12	.3986	.4965	.5804	.6713	.7273	.8182
13	.3791	.4720	.5549	.6429	.6978	.7912
14	.3626	.4593	.5341	.6220	.6747	.7670
15	.3500	.4429	.5179	.6000	.6536	.7464
16	.3382	.4265	.5000	.5824	.6324	.7265
17	.3260	.4118	.4853	.5637	.6152	.7083
18	.3148	.3994	.4716	.5480	.5975	.6904
19	.3070	.3895	.4579	.5333	.5825	.6737
20	.2977	.3789	.4451	.5203	.5684	.6586
21	.2909	.3688	.4351	.5078	.5545	.6455
22	.2829	.3597	.4241	.4963	.5426	.6313
23	.2767	.3518	.4150	.4852	.5306	.6186
24	.2704	.3435	.4061	.4748	.5200	.6070
25	.2645	.3362	.3977	.4654	.5100	.5962
26	.2588	.3299	.3894	.4564	.5002	.5856
27	.2540	.3236	.3822	.4481	.4915	.5757
28	.2490	.3175	.3749	.4401	.4828	.5660
29	.2443	.3113	.3685	.4320	.4744	.5567
30	.2400	.3059	.3620	.4251	.4665	.5479

For n greater than 30 the approximate quantiles of ρ may be obtained from

$$w_p \cong \frac{x_p}{\sqrt{n-1}}$$

where x_p is the p quantile of a standard normal random variable obtained from Table I.

SOURCE. Adapted from Glasser and Winter (1961), with corrections.

^a The entries in this table are selected quantiles w_p of the Spearman rank correlation coefficient ρ when used as a test statistic. The lower quantiles may be obtained from the equation

$$w_p = -w_{1-p}$$

The critical region corresponds to values of ρ smaller than (or greater than) but not including the appropriate quantile. Note that the median of ρ is 0.

Lampiran 5 : Harga Kuantil T

n	$p = .001$.005	.010	.025	.050	.100	$\frac{1}{6}n(n^2 - 1)$
4					2	2	20
5			2	2	4	6	40
6		2	4	6	8	14	70
7	2	6	8	14	18	26	112
8	6	12	16	24	32	42	168
9	12	22	28	38	50	64	240
10	22	36	44	60	74	92	330
11	36	56	66	86	104	128	440
12	52	78	94	120	144	172	572
13	76	110	130	162	190	226	728
14	106	148	172	212	246	290	910
15	142	194	224	270	312	364	1120
16	186	250	284	340	390	450	1360
17	238	314	356	420	480	550	1632
18	300	390	438	512	582	664	1938
19	372	476	532	618	696	790	2280
20	454	574	638	738	826	934	2660
21	546	686	758	870	972	1092	3080
22	652	810	892	1020	1134	1270	3542
23	772	950	1042	1184	1312	1464	4048
24	904	1104	1208	1366	1510	1678	4600
25	1050	1274	1390	1566	1726	1912	5200
26	1212	1462	1590	1786	1960	2168	5850
27	1390	1666	1808	2024	2216	2444	6552
28	1586	1890	2046	2284	2494	2744	7308
29	1800	2134	2306	2564	2796	3068	8120
30	2032	2398	2584	2868	3120	3416	8990

For n greater than 30, the quantiles of T may be approximated by

$$w_p \approx \frac{1}{6}n(n^2 - 1) + z_p \cdot \frac{1}{6} \frac{n(n^2 - 1)}{\sqrt{n - 1}}$$

where z_p is the p th quantile of a standard normal random variable given in Table 1.

SOURCE. Adapted from Glasser and Winter (1961), with corrections.

^a The entries in this table are the quantiles w_p of the Hotelling-Pabst test statistic T , defined by Equation (5.5.11), for selected values of p . Note that $P(T < w_p) \leq p$. Upper quantiles may be found from the equation

$$w_{1-p} = \frac{1}{6}n(n^2 - 1) - w_p$$

Critical regions correspond to values of T less than (or greater than) but not including the appropriate quantiles. Note that the median of T is given by

$$w_{.50} = \frac{1}{6}n(n^2 - 1)$$