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A Simple Method for Generation of Statistical Tables by the Help of Excel Software

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Abstract: A simple and easy method is employed to construct complete statistical tables like Student's t-distribution, F distribution, Chi-square distribution and Cumulative standard normal distribution in Excel software which are used in all fields of research. Also, we generate other statistical tables like Cumulative binomial distribution, Cumulative Poisson distribution, Fisher transformation and Fisher inverse transformation. The proposed method depends only on the Excel software; it does not depend on the traditional statistical tables.

Key Words: *Student's t-distribution, F-distribution, Chi square distribution, Normal distribution and Excel.*

1. Introduction

Statistical tables are very important issues in data analysis because whenever the researchers want to test their hypothesis, they need a critical value which is available in the statistical tables. Now a days, Software's are very helpful to all the researchers or the experimenter to solve their problems within the seconds. In this paper, we construct statistical tables like Student's t-distribution, F distribution, Chi-square distribution and Cumulative standard normal distribution which are mostly used in all the fields of research. There have already been proposed various statistical tables to investigate the hypothesis according to the situation e.g. Gosset (1908) developed Student's t-distribution, Snedecor (1934) proposed F distribution, according to Chaudary (1996) the chi square distribution was first obtained in 1875 by Helmert and De Moivre (1738) worked firstly on the Normal distribution but no software is available to present all the values of a table at the same time. Each statistical software provides only one critical value at one time. In this paper, we construct the complete statistical tables using the statistical functions which are available in the Excel.

The rest of the paper is ordered as follows. The next section reviews the methodology; the third section presents the results and discussion and finally, concludes the study.

2. Methodology

In this section, four statistical distributions are described briefly which are used in our study.

Student's t-distribution: Student's t-distribution was developed by Gosset (1908). Student was the pen name in the student's t distribution. The t-distribution is used for small sample size and applied in statistical inference specially. The distribution depends upon only one parameter. Table 1 gives the concise use of Student's t test. A Student t-distribution is defined by the density function as:

$$f_{v}(x)=\frac{1}{\sqrt{v}\beta(\frac{1}{2},\frac{v}{2})}\left(1+\frac{x^{2}}{v}\right)^{-\ v+1\ /2} \qquad (1)$$

Where β the beta function, x is the variable and v is the parameter.

F-distribution: To test the hypothesis of the differences between two means when variances are equal then we used t- distribution but in many times the variance are not equal, to check this assumption we used F-distribution. F-distribution was proposed by Snedecor (1934). This distribution depends upon two parameters, namely $v_1 \, and \, v_2$ degrees of freedom in the numerator and degrees of freedom in the denominator respectively.

Table 1: Tests on population means of normal distributions (When variances are unknown)

Hypotheses	Test Statistic	Critical Region
1. $H_o : \mu = \mu_o$ $H_1 : \mu \neq \mu_o$		$\lvert t' \rvert > t_{\alpha/2, n-1}$
2. $H_o : \mu = \mu_o$ $H_1 : \mu < \mu_o$	$t' = \dfrac{\bar{x} - \mu_o}{S/\sqrt{n}}$	$t' < -t_{\alpha, n-1}$
3. $H_o : \mu = \mu_o$ $H_1 : \mu > \mu_o$		$t' > t_{\alpha, n-1}$
4. $H_o : \mu_1 = \mu_2$ $H_1 : \mu_1 \neq \mu_2$	$t' = \dfrac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{S_p \sqrt{\dfrac{1}{n_1} + \dfrac{1}{n_2}}}$	$\lvert t' \rvert > t_{\alpha/2}, v$ $where \, v = n_1 + n_2 - 2$
5. $H_o : \mu_1 = \mu_2$ $H_1 : \mu_1 < \mu_2$	$t' = \dfrac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{S_1^2}{n_1} + \dfrac{S_2^2}{n_2}}}$	$t' < -t_\alpha, v$ $v = \dfrac{\left(\dfrac{S_1^2}{n_1} + \dfrac{S_2^2}{n_2}\right)^2}{\dfrac{(S_1^2/n_1)^2}{n_1+1} + \dfrac{(S_2^2/n_2)^2}{n_2+1}} - 2$
6. $H_o : \mu_1 = \mu_2$ $H_1 : \mu_1 > \mu_2$		$t' > t_\alpha, v$ $v = \dfrac{\left(\dfrac{S_1^2}{n_1} + \dfrac{S_2^2}{n_2}\right)^2}{\dfrac{(S_1^2/n_1)^2}{n_1+1} + \dfrac{(S_2^2/n_2)^2}{n_2+1}} - 2$

Tables 2 present the use of the F distribution. The probability density function of F-distribution follows in equation (2) as:

$$f(F) = \frac{\Gamma \; (v_1 + v_2)/2 \; (v_1/v_2)^{v_1/2} F^{(v_1/2)-1}}{\Gamma(v_1/2)\Gamma(v_2/2)[1 + v_1 F/v_2]^{(v_1+v_2)/2}}, 0 < F < \infty \qquad (2)$$

The probability density function of F- distribution depends only on the degrees of freedom in the numerator and degrees of freedom in the denominator respectively.

Chi square (χ^2)-distribution: The chi-square distribution was first developed by Helmert in 1875. The χ^2 distribution has only one parameter which is called the number of degrees of freedom. Table 2 present the brief use of the χ^2 distribution. A χ^2 distribution is defined by the density function has the following form in equation (3) as:

$$f(\chi^2) = \frac{1}{2^{n/2}\Gamma(n/2)}(\chi^2)^{(n/2)-1}.e^{-\chi^2/2}, 0 < \chi^2 < \infty \qquad (3)$$

The density function of Chi-square distribution depends only on the degree of freedom n.

Table 2. Tests on population variances of normal distributions

Hypothesis	Test Statistic	Critical Region
1. $H_o: \sigma^2 = \sigma_o^2$ $H_1: \sigma^2 \neq \sigma_o^2$	$\chi_o^2 = \frac{(n-1)S^2}{\sigma_o^2}$	$\chi_o^2 > \chi^2_{\alpha/2,n-1}$ or $\chi_o^2 < \chi^2_{1-\alpha/2,n-1}$
2. $H_o: \sigma^2 = \sigma_o^2$ $H_1: \sigma^2 < \sigma_o^2$		$\chi_o^2 < \chi^2_{1-\alpha,n-1}$
3. $H_o: \sigma^2 = \sigma_o^2$ $H_1: \sigma^2 > \sigma_o^2$		$\chi_o^2 > \chi^2_{\alpha,n-1}$
4. $H_o: \sigma_1^2 = \sigma_2^2$ $H_1: \sigma_1^2 \neq \sigma_2^2$	$F_o = \frac{S_1^2}{S_2^2}$	$F_o > F_{\alpha/2,n_1-1,n_2-1}$ or $F_o < F_{1-\alpha/2,n_1-1,n_2-1}$
5. $H_o: \sigma_1^2 = \sigma_2^2$ $H_1: \sigma_1^2 < \sigma_2^2$	$F_o = \frac{S_2^2}{S_1^2}$	$F_o > F_{\alpha,n_2-1,n_1-1}$
6. $H_o: \sigma_1^2 = \sigma_2^2$ $H_1: \sigma_1^2 > \sigma_2^2$	$F_o = \frac{S_1^2}{S_2^2}$	$F_o > F_{\alpha,n_1-1,n_2-1}$

Normal distribution: Normal distribution is the limiting form of the binomial distribution by increasing n (number of trials) and for a fixed value of p (probability of success), was discovered by De Moivre (1738). Tables 3 present the brief use of the Normal distribution. A normal distribution is defined by the probability density function as under.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\left[\, x-\mu\ ^2/2\sigma^2 \right]}, \quad for -\infty < x < \infty, and\ \sigma > 0 \tag{4}$$

Where μ is the mean, σ is the standard deviation, π and e are constants values are equal to 3.1416 and 2.7183 respectively. Normal distribution has two parameters say μ and σ also the density function of normal distribution depends upon μ and σ.

Table 3: Tests on population means of normal distributions (When variances are known)

Hypothesis	Test Statistic	Critical Region
1. $H_o: \mu = \mu_o$ $H_1: \mu \neq \mu_o$	$Z' = \frac{\bar{x} - \mu_o}{\sigma/\sqrt{n}}$	$\lvert Z' \rvert > Z_{\alpha/2}$
2. $H_o: \mu = \mu_o$ $H_1: \mu < \mu_o$		$Z' < -Z_\alpha$
3. $H_o: \mu = \mu_o$ $H_1: \mu > \mu_o$		$Z' > Z_\alpha$
4. $H_o: \mu_1 = \mu_2$ $H_1: \mu_1 \neq \mu_2$	$Z' = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$	$\lvert Z' \rvert > Z_{\alpha/2}$
5. $H_o: \mu_1 = \mu_2$ $H_1: \mu_1 < \mu_2$		$Z' < -Z_\alpha$
6. $H_o: \mu_1 = \mu_2$ $H_1: \mu_1 > \mu_2$		$Z' > Z_\alpha$

3. Results and Discussion

To generate the t-distribution table, we have to need the degrees of freedom and the probability values which is denoted by the α in the right hand tail. Formulas must begin with an equal sign "=" in Excel. In Excel, we used the formula = TINV (probability, deg_freedom) to construct the t- distribution table and Excel will return the inverse of the t-distribution. Here, probability means the critical values say α and deg_freedom means the degree of freedom. First of all, we choose the different critical values e.g. 0.0005, 0.001, 0.005, 0.01, 0.025, 0.05, 0.1, and 0.2 and secondly taking the degrees of freedom which starts from 1, 2, 3 and so on. Suppose for $\alpha = 0.05$, firstly we write the critical value 0.05 and secondly write the degrees of freedom say 1 in the above function and drag up to the requirement. Same procedure adopt for the other critical values. See Table 4 for complete t-distribution table for all critical values which are assumed in our study. Our calculated table values are similar with the traditional tables like Montgomery (1984) and Larry (1998).

To generate the F-distribution table, we have to need the degrees of freedom in the numerator say v_1 and the denominator say v_2 respectively and the probability values which is denoted by the α . In Excel, we used the formula = FINV (probability, deg_freedom 1, deg_freedom 2). Here, probability means the critical values which you have required say α and deg_freedom 1 means the degree of freedom of the numerator and the deg_freedom 2 indicate the degree of freedom of the denominator. Excel will return the inverse of the F-distribution. First of all, we choose the critical value e.g. 0.1 and secondly taking the degrees of freedom of v_1 and v_2 which starts from 1 and 1 respectively and drag up to the requirement. See Table 5 in appendix for complete F-distribution table for 1% critical value which is assumed in our study.

To produce the χ^2 distribution table, we have to need the degrees of freedom and the probability values which is denoted by the α . In Excel, we used the formula = CHINV (probability, deg_freedom) and Excel will return the inverse of the one tailed probability of χ^2 distribution. First of all, we choose the critical values e.g. 0.995, 0.990, 0.975, 0.950, 0.900, 0.100, 0.050, 0.025 and 0.010 and secondly taking the degrees of freedom starts from 1 and so on and drag up to the requirement. See Table 6 in appendix for complete χ^2 distribution table for the selected critical values which is assumed in our study.

To build the cumulative standard normal table, just we have to need the z values and the probability values which is denoted by the α . In Excel, we used the formula = NORMSDIST (z) and Excel will return the probability from $-\infty$ to a particular point say x (i,e. $P(X \leq x)$). We select the critical values e.g. 0, 0.01, 0.02, 0.03, 0.04, 0.05 and 0.06 and secondly taking the Z values e.g. -3.7 up to +3.7. See Table 7 in appendix for complete cumulative standard normal distribution for the selected critical values which is assumed in our study.

In the end, we also generate others statistical tables like Cumulative binomial distribution, Cumulative Poisson distribution, Fisher transformation and Fisher inverse transformation. For Cumulative binomial distribution, we used the statistical function of = BINOMDIST (number_s, trials, probability_s, cumulative). Here, in the above syntax number_s indicates the number of trials (must be integer), trials means the independent trials, probability_s shows the probability of success and two options are available in Excel for cumulative one is false and the other is true, If we use false then Excel will return the mass function and if we write true then it will return the cumulative distribution function. To draw the Cumulative Poisson distribution table, we employed = POISSON (x, mean, cumulative). Here, in the above syntax x indicates the number of events (must be integer), mean is the expected numeric value and cumulative operates the same as in Binomial distribution. See Table 8 & 9 for cumulative binomial and Poisson distribution. For Fisher transformation and Fisher inverse transformation (tables are not reported in our study), we used =FISHER (x) and =FISHERINV (y) where x is a numeric value for which you want the transformation and y is the value for which you want to perform the inverse of the transformation respectively.

4. Conclusion

In this manuscript, a simple and easy method is used to construct statistical tables like Student's t-distribution, F distribution, Chi-square distribution and Cumulative standard normal distribution in Excel software which are mostly used in all fields of research. The method depends upon only the Excel software; it does not depend on the traditional statistical tables. Also, we develop others statistical tables like Cumulative binomial distribution, Cumulative Poisson distribution, Fisher transformation and Fisher inverse transformation using the statistical functions. This study will hopefully help the researchers to take the decisions about their hypothesis by the help of only Excel software not depend on the traditional statistical tables.

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Appendix

Table 4: Student t-distribution table

Degrees of freedom (V)	Amount of area in one tail (α)							
	0.0005	**0.001**	**0.005**	**0.010**	**0.025**	**0.050**	**0.100**	**0.200**
1	636.6192	318.3088	63.65674	31.82052	12.70620	6.313752	3.077684	1.376382
2	31.59905	22.32712	9.924843	6.964557	4.302653	2.919986	1.885618	1.060660
3	12.92398	10.21453	5.840909	4.540703	3.182446	2.353363	1.637744	0.978472
4	8.610302	7.173182	4.604095	3.746947	2.776445	2.131847	1.533206	0.940965
5	6.868827	5.893430	4.032143	3.364930	2.570582	2.015048	1.475884	0.919544
6	5.958816	5.207626	3.707428	3.142668	2.446912	1.943180	1.439756	0.905703
7	5.407883	4.785290	3.499483	2.997952	2.364624	1.894579	1.414924	0.896030
8	5.041305	4.500791	3.355387	2.896459	2.306004	1.859548	1.396815	0.888890
9	4.780913	4.296806	3.249836	2.821438	2.262157	1.833113	1.383029	0.883404
10	4.586894	4.143700	3.169273	2.763769	2.228139	1.812461	1.372184	0.879058
11	4.436979	4.024701	3.105807	2.718079	2.200985	1.795885	1.363430	0.875530
12	4.317791	3.929633	3.054540	2.680998	2.178813	1.782288	1.356217	0.872609
13	4.220832	3.851982	3.012276	2.650309	2.160369	1.770933	1.350171	0.870152
14	4.140454	3.787390	2.976843	2.624494	2.144787	1.761310	1.345030	0.868055
15	4.072765	3.732834	2.946713	2.602480	2.131450	1.753050	1.340606	0.866245
16	4.014996	3.686155	2.920782	2.583487	2.119905	1.745884	1.336757	0.864667
17	3.965126	3.645767	2.898231	2.566934	2.109816	1.739607	1.333379	0.863279

18	3.921646	3.610485	2.878440	2.552380	2.100922	1.734064	1.330391	0.862049
19	3.883406	3.579400	2.860935	2.539483	2.093024	1.729133	1.327728	0.860951
20	3.849516	3.551808	2.845340	2.527977	2.085963	1.724718	1.325341	0.859964
21	3.819277	3.527154	2.831360	2.517648	2.079614	1.720743	1.323188	0.859074
22	3.792131	3.504992	2.818756	2.508325	2.073873	1.717144	1.321237	0.858266
23	3.767627	3.484964	2.807336	2.499867	2.068658	1.713872	1.319460	0.857530
24	3.745399	3.466777	2.796939	2.492159	2.063899	1.710882	1.317836	0.856855
25	3.725144	3.450189	2.787436	2.485107	2.059539	1.708141	1.316345	0.856236
26	3.706612	3.434997	2.778715	2.478630	2.055529	1.705618	1.314972	0.855665
27	3.689592	3.421034	2.770683	2.472660	2.051830	1.703288	1.313703	0.855137
28	3.673906	3.408155	2.763262	2.467140	2.048407	1.701131	1.312527	0.854647
29	3.659405	3.396240	2.756386	2.462021	2.045230	1.699127	1.311434	0.854192
30	3.645959	3.385185	2.749996	2.457262	2.042272	1.697261	1.310415	0.853767
31	3.633456	3.374899	2.744042	2.452824	2.039513	1.695519	1.309464	0.853370
32	3.621802	3.365306	2.738481	2.448678	2.036933	1.693889	1.308573	0.852998
33	3.610913	3.356337	2.733277	2.444794	2.034515	1.692360	1.307737	0.852649
34	3.600716	3.347934	2.728394	2.441150	2.032244	1.690924	1.306952	0.852321
35	3.591147	3.340045	2.723806	2.437723	2.030108	1.689572	1.306212	0.852012
36	3.582150	3.332624	2.719485	2.434494	2.028094	1.688298	1.305514	0.851720
37	3.573675	3.325631	2.715409	2.431447	2.026192	1.687094	1.304854	0.851444
38	3.565678	3.319030	2.711558	2.428568	2.024394	1.685954	1.304230	0.851183
39	3.558120	3.312788	2.707913	2.425841	2.022691	1.684875	1.303639	0.850935
40	3.550966	3.306878	2.704459	2.423257	2.021075	1.683851	1.303077	0.850700
41	3.544184	3.301273	2.701181	2.420803	2.019541	1.682878	1.302543	0.850476
42	3.537745	3.295951	2.698066	2.418470	2.018082	1.681952	1.302035	0.850263
43	3.531626	3.290890	2.695102	2.416250	2.016692	1.681071	1.301552	0.850060
44	3.525801	3.286072	2.692278	2.414134	2.015368	1.680230	1.301090	0.849867
45	3.520251	3.281480	2.689585	2.412116	2.014103	1.679427	1.300649	0.849682
46	3.514957	3.277098	2.687013	2.410188	2.012896	1.678660	1.300228	0.849505
47	3.509901	3.272912	2.684556	2.408345	2.011740	1.677927	1.299825	0.849336
48	3.505068	3.268910	2.682204	2.406581	2.010635	1.677224	1.299439	0.849174
49	3.500443	3.265079	2.679952	2.404892	2.009575	1.676551	1.299069	0.849018
50	3.496013	3.261409	2.677793	2.403272	2.008559	1.675905	1.298714	0.848869
51	3.491766	3.257890	2.675722	2.401718	2.007584	1.675285	1.298373	0.848726
52	3.487691	3.254512	2.673734	2.400225	2.006647	1.674689	1.298045	0.848588
53	3.483777	3.251268	2.671823	2.398790	2.005746	1.674116	1.297730	0.848456
54	3.480016	3.248149	2.669985	2.397410	2.004879	1.673565	1.297426	0.848328
55	3.476398	3.245149	2.668216	2.396081	2.004045	1.673034	1.297134	0.848205
56	3.472916	3.242261	2.666512	2.394801	2.003241	1.672522	1.296853	0.848087
57	3.469562	3.239478	2.664870	2.393567	2.002465	1.672029	1.296581	0.847973
58	3.466329	3.236795	2.663287	2.392377	2.001717	1.671553	1.296319	0.847862

59	3.463210	3.234207	2.661759	2.391229	2.000995	1.671093	1.296066	0.847756
60	3.460200	3.231709	2.660283	2.390119	2.000298	1.670649	1.295821	0.847653
61	3.457294	3.229296	2.658857	2.389047	1.999624	1.670219	1.295585	0.847553
62	3.454485	3.226964	2.657479	2.388011	1.998971	1.669804	1.295356	0.847457
63	3.451769	3.224709	2.656145	2.387008	1.998341	1.669402	1.295134	0.847364
64	3.449142	3.222527	2.654854	2.386037	1.997730	1.669013	1.294920	0.847274
65	3.446598	3.220414	2.653604	2.385097	1.997138	1.668636	1.294712	0.847186
66	3.444135	3.218368	2.652393	2.384186	1.996564	1.668271	1.294511	0.847101
67	3.441749	3.216386	2.651220	2.383302	1.996008	1.667916	1.294315	0.847019
68	3.439435	3.214463	2.650081	2.382446	1.995469	1.667572	1.294126	0.846939
69	3.437192	3.212599	2.648977	2.381614	1.994945	1.667239	1.293942	0.846862
70	3.435015	3.210789	2.647905	2.380807	1.994437	1.666914	1.293763	0.846786
71	3.432901	3.209032	2.646863	2.380024	1.993943	1.666600	1.293589	0.846713
72	3.430848	3.207326	2.645852	2.379262	1.993464	1.666294	1.293421	0.846642
73	3.428854	3.205668	2.644869	2.378522	1.992997	1.665996	1.293256	0.846573

Table 5: Critical values of the F-distribution at 1%

v_2	v_1									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	39.86346	49.50000	53.59324	55.83296	57.24008	58.20442	58.90595	59.43898	59.85759	60.19498
2	8.526316	9.000000	9.161790	9.243416	9.292626	9.325530	9.349081	9.366770	9.380544	9.391573
3	5.538319	5.462383	5.390773	5.342644	5.309157	5.284732	5.266195	5.251671	5.239996	5.230411
4	4.544771	4.324555	4.190860	4.107250	4.050579	4.009749	3.978966	3.95494	3.935671	3.919876
5	4.060420	3.779716	3.619477	3.520196	3.452982	3.404507	3.367899	3.339276	3.316281	3.297402
6	3.775950	3.463304	3.288762	3.180763	3.107512	3.054551	3.014457	2.983036	2.957741	2.936935
7	3.589428	3.257442	3.074072	2.960534	2.883344	2.827392	2.784930	2.751580	2.724678	2.702510
8	3.457919	3.113118	2.923796	2.806426	2.726447	2.668335	2.624135	2.589349	2.561238	2.538037
9	3.360303	3.006452	2.812863	2.692680	2.610613	2.550855	2.505313	2.469406	2.440340	2.416316
10	3.285015	2.924466	2.727673	2.605336	2.521641	2.460582	2.413965	2.377150	2.347306	2.322604
11	3.225202	2.859511	2.660229	2.536188	2.451184	2.389067	2.341566	2.303997	2.273502	2.248230
12	3.176549	2.806796	2.605525	2.480102	2.394022	2.331024	2.282780	2.244575	2.213525	2.187764
13	3.136205	2.763167	2.560273	2.433705	2.346724	2.282979	2.234103	2.19535	2.163820	2.137635
14	3.102213	2.726468	2.522224	2.394692	2.306943	2.242559	2.193134	2.153904	2.121955	2.095396
15	3.073185	2.695173	2.489788	2.361433	2.273022	2.208082	2.158178	2.118530	2.086209	2.059319
16	3.048110	2.668171	2.461811	2.332745	2.243758	2.178329	2.128003	2.087982	2.055331	2.028145
17	3.026232	2.644638	2.437434	2.307747	2.218253	2.152392	2.101689	2.061336	2.028388	2.000936
18	3.006977	2.623947	2.416005	2.285772	2.195827	2.129581	2.078541	2.037889	2.004674	1.976980
19	2.989900	2.605612	2.397022	2.266303	2.175956	2.109364	2.058020	2.017098	1.983639	1.955725
20	2.974653	2.589254	2.380087	2.248934	2.158227	2.091322	2.039703	1.998534	1.964853	1.936738
21	2.960956	2.574569	2.364888	2.233345	2.142311	2.075123	2.023252	1.981858	1.947974	1.919674
22	2.948585	2.561314	2.351170	2.219274	2.127944	2.060497	2.008397	1.966796	1.932725	1.904255

23	2.937356	2.549290	2.338727	2.206512	2.114911	2.047227	1.994915	1.953124	1.918880	1.890252
24	2.927117	2.538332	2.327390	2.194882	2.103033	2.035132	1.982625	1.940658	1.906255	1.877480
25	2.917745	2.528305	2.317017	2.184242	2.092165	2.024062	1.971376	1.929246	1.894693	1.865782
26	2.909132	2.519096	2.307491	2.174469	2.082182	2.013893	1.961039	1.918758	1.884067	1.855028
27	2.901191	2.510609	2.298712	2.165463	2.072981	2.004519	1.951510	1.909087	1.874267	1.845109
28	2.893846	2.502761	2.290595	2.157136	2.064473	1.995851	1.942696	1.900141	1.865199	1.835930
29	2.887033	2.495483	2.283069	2.149415	2.056583	1.987811	1.934521	1.891842	1.856786	1.827412
30	2.880694	2.488716	2.276071	2.142235	2.049246	1.980333	1.926916	1.884121	1.848958	1.819485
31	2.874784	2.482407	2.269548	2.135542	2.042406	1.973361	1.919825	1.876920	1.841657	1.812091
32	2.869259	2.476512	2.263453	2.129288	2.036014	1.966845	1.913196	1.870189	1.834831	1.805176
33	2.864083	2.470990	2.257744	2.123430	2.030027	1.960742	1.906987	1.863882	1.828434	1.798697
34	2.859225	2.465809	2.252387	2.117934	2.024408	1.955014	1.901158	1.857961	1.822428	1.792612
35	2.854655	2.460936	2.247350	2.112765	2.019124	1.949626	1.895676	1.852392	1.816778	1.786887
36	2.850349	2.456346	2.242605	2.107896	2.014147	1.944550	1.890511	1.847144	1.811453	1.781491
37	2.846285	2.452014	2.238128	2.103302	2.009449	1.939760	1.885635	1.842190	1.806426	1.776396
38	2.842442	2.447920	2.233896	2.098959	2.005009	1.935231	1.881026	1.837505	1.801673	1.771578
39	2.838804	2.444044	2.229890	2.094848	2.000805	1.930944	1.876661	1.833070	1.797171	1.767014
40	2.835354	2.440369	2.226092	2.090950	1.996820	1.926879	1.872522	1.828863	1.792902	1.762686
41	2.832078	2.436880	2.222486	2.087250	1.993036	1.923019	1.868593	1.824869	1.788847	1.758575
42	2.828964	2.433564	2.219059	2.083732	1.989439	1.919349	1.864856	1.821071	1.784991	1.754665
43	2.825999	2.430407	2.215796	2.080384	1.986015	1.915856	1.861300	1.817455	1.781320	1.750942
44	2.823173	2.427399	2.212688	2.077194	1.982752	1.912527	1.857909	1.814008	1.777820	1.747393
45	2.820476	2.424529	2.209722	2.074151	1.979639	1.909351	1.854675	1.810719	1.774480	1.744006
46	2.817901	2.421788	2.206890	2.071244	1.976666	1.906317	1.851585	1.807577	1.771290	1.740769
47	2.815438	2.419168	2.204182	2.068465	1.973823	1.903416	1.848631	1.804573	1.768239	1.737674
48	2.813081	2.416660	2.201591	2.065805	1.971103	1.900640	1.845803	1.801697	1.765318	1.734712
49	2.810823	2.414258	2.199109	2.063258	1.968497	1.897981	1.843094	1.798942	1.762520	1.731872
50	2.808658	2.411955	2.196730	2.060816	1.965999	1.895431	1.840496	1.796300	1.759836	1.729150
51	2.806580	2.409745	2.194446	2.058472	1.963601	1.892984	1.838004	1.793764	1.757260	1.726536
52	2.804584	2.407622	2.192254	2.056221	1.961299	1.890634	1.835609	1.791328	1.754786	1.724025
53	2.802665	2.405582	2.190146	2.054058	1.959085	1.888375	1.833307	1.788987	1.752407	1.721611
54	2.800819	2.403620	2.188119	2.051977	1.956956	1.886201	1.831093	1.786734	1.750118	1.719288
55	2.799043	2.401731	2.186167	2.049974	1.954907	1.884109	1.828961	1.784565	1.747914	1.717052
56	2.797331	2.399911	2.184287	2.048044	1.952933	1.882094	1.826907	1.782475	1.745791	1.714897
57	2.795681	2.398157	2.182475	2.046184	1.951030	1.880151	1.824928	1.780461	1.743744	1.712819
58	2.794089	2.396465	2.180727	2.044390	1.949194	1.878277	1.823018	1.778517	1.741769	1.710814
59	2.792552	2.394832	2.179040	2.042658	1.947422	1.876468	1.821174	1.776641	1.739862	1.708879
60	2.791068	2.393255	2.177411	2.040986	1.945710	1.874720	1.819393	1.774829	1.738020	1.707009
61	2.789633	2.391731	2.175836	2.039370	1.944056	1.873032	1.817672	1.773077	1.736240	1.705201
62	2.788246	2.390257	2.174314	2.037807	1.942457	1.871399	1.816007	1.771383	1.734518	1.703453
63	2.786904	2.388831	2.172841	2.036295	1.940910	1.869819	1.814397	1.769744	1.732852	1.701762

64	2.785604	2.387451	2.171415	2.034831	1.939412	1.868289	1.812838	1.768158	1.731239	1.700124
65	2.784346	2.386114	2.170035	2.033414	1.937961	1.866808	1.811328	1.766621	1.729677	1.698538
66	2.783127	2.384818	2.168697	2.032040	1.936556	1.865373	1.809865	1.765131	1.728163	1.697000
67	2.781944	2.383563	2.167399	2.030709	1.935193	1.863981	1.808446	1.763687	1.726695	1.695510
68	2.780797	2.382344	2.166141	2.029417	1.933871	1.862631	1.807070	1.762286	1.725271	1.694063
69	2.779684	2.381163	2.164921	2.028164	1.932589	1.861321	1.805735	1.760927	1.723888	1.692660
70	2.778604	2.380015	2.163735	2.026947	1.931343	1.860049	1.804438	1.759607	1.722546	1.691297
71	2.777554	2.378901	2.162585	2.025766	1.930134	1.858814	1.803179	1.758325	1.721243	1.689973
72	2.776535	2.377818	2.161466	2.024618	1.928959	1.857614	1.801955	1.757079	1.719976	1.688686
73	2.775543	2.376765	2.160379	2.023502	1.927817	1.856448	1.800766	1.755868	1.718745	1.687436
74	2.774579	2.375742	2.159322	2.022417	1.926706	1.855313	1.799609	1.754690	1.717547	1.686219

Table 6: Chi- Square distribution table

ν	**Amount of α in right hand tail**								
	0.995	**0.990**	**0.975**	**0.95**	**0.900**	**0.100**	**0.050**	**0.025**	**0.010**
1	3.92704E-05	0.000157	0.000982	0.003932	0.015791	2.705544	3.841459	5.023886	6.634897
2	0.010025084	0.020101	0.050636	0.102587	0.210721	4.605170	5.991465	7.377759	9.210340
3	0.071721775	0.114832	0.215795	0.351846	0.584374	6.251388	7.814728	9.348404	11.34487
4	0.206989093	0.297109	0.484419	0.710723	1.063623	7.779440	9.487729	11.14329	13.27670
5	0.411741904	0.554298	0.831212	1.145476	1.610308	9.236357	11.07050	12.83250	15.08627
6	0.675726778	0.872090	1.237344	1.635383	2.204131	10.64464	12.59159	14.44938	16.81189
7	0.989255685	1.239042	1.689869	2.167350	2.833107	12.01704	14.06714	16.01276	18.47531
8	1.344413088	1.646497	2.179731	2.732637	3.489539	13.36157	15.50731	17.53455	20.09024
9	1.734932909	2.087901	2.700390	3.325113	4.168159	14.68366	16.91898	19.02277	21.66599
10	2.155856482	2.558212	3.246973	3.940299	4.865182	15.98718	18.30704	20.48318	23.20925
11	2.603221895	3.053484	3.815748	4.574813	5.577785	17.27501	19.67514	21.92005	24.72497
12	3.073823653	3.570569	4.403789	5.226029	6.303796	18.54935	21.02607	23.33666	26.21697
13	3.565034584	4.106915	5.008751	5.891864	7.041505	19.81193	22.36203	24.73560	27.68825
14	4.074674969	4.660425	5.628726	6.570631	7.789534	21.06414	23.68479	26.11895	29.14124
15	4.600915599	5.229349	6.262138	7.260944	8.546756	22.30713	24.99579	27.48839	30.57791
16	5.142205451	5.812213	6.907664	7.961646	9.312236	23.54183	26.29623	28.84535	31.99993
17	5.697217119	6.407760	7.564186	8.671760	10.08519	24.76904	27.58711	30.19101	33.40866
18	6.264804719	7.014911	8.230746	9.390455	10.86494	25.98942	28.86930	31.52638	34.80531
19	6.843971456	7.632730	8.906517	10.117010	11.65091	27.20357	30.14353	32.85233	36.19087
20	7.433844283	8.260398	9.590778	10.850810	12.44261	28.41198	31.41043	34.16961	37.56623
21	8.033653456	8.897198	10.28290	11.591310	13.23960	29.61509	32.67057	35.47888	38.93217
22	8.642716463	9.542492	10.98232	12.338010	14.04149	30.81328	33.92444	36.78071	40.28936
23	9.260424795	10.19572	11.68855	13.090510	14.84796	32.00690	35.17246	38.07563	41.63840
24	9.886233535	10.85636	12.40115	13.848430	15.65868	33.19624	36.41503	39.36408	42.97982
25	10.51965217	11.52398	13.11972	14.611410	16.47341	34.38159	37.65248	40.64647	44.31410
26	11.16023749	12.19815	13.84391	15.379160	17.29189	35.56317	38.88514	41.92317	45.64168

27	11.80758738	12.87850	14.57338	16.151400	18.11390	36.74122	40.11327	43.19451	46.96294
28	12.46133599	13.56471	15.30786	16.927880	18.93924	37.91592	41.33714	44.46079	48.27824
29	13.12114895	14.25645	16.04707	17.708370	19.76774	39.08747	42.55697	45.72229	49.58788
30	13.78671996	14.95346	16.79077	18.492660	20.59923	40.25602	43.77297	46.97924	50.89218
31	14.45776752	15.65546	17.53874	19.280570	21.43356	41.42174	44.98534	48.23189	52.19139
32	15.13403215	16.36222	18.29076	20.071910	22.27059	42.58475	46.19426	49.48044	53.48577
33	15.81527449	17.07351	19.04666	20.866530	23.11020	43.74518	47.39988	50.72508	54.77554
34	16.50127257	17.78915	19.80625	21.664280	23.95225	44.90316	48.60237	51.96600	56.06091
35	17.19182048	18.50893	20.56938	22.465020	24.79666	46.05879	49.80185	53.20335	57.34207
36	17.88672669	19.23268	21.33588	23.268610	25.64330	47.21217	50.99846	54.43729	58.61921
37	18.58581253	19.96023	22.10563	24.07494	26.49209	48.36341	52.19232	55.66797	59.89250
38	19.28891165	20.69144	22.87848	24.88390	27.34295	49.51258	53.38354	56.89552	61.16209
39	19.99586800	21.42616	23.65432	25.69539	28.19579	50.65977	54.57223	58.12006	62.42812
40	20.70653548	22.16426	24.43304	26.50930	29.05052	51.80506	55.75848	59.34171	63.69074
41	21.42077698	22.90561	25.21452	27.32555	29.90709	52.94851	56.94239	60.56057	64.95007
42	22.13846338	23.65009	25.99866	28.14405	30.76542	54.09020	58.12404	61.77676	66.20624
43	22.8594737	24.39760	26.78537	28.96472	31.62545	55.23019	59.30351	62.99036	67.45935
44	23.58369335	25.14803	27.57457	29.78748	32.48713	56.36854	60.48089	64.20146	68.70951
45	24.31101434	25.90127	28.36615	30.61226	33.35038	57.50530	61.65623	65.41016	69.95683
46	25.04133458	26.65724	29.16005	31.43900	34.21517	58.64054	62.82962	66.61653	71.20140
47	25.77455744	27.41585	29.95620	32.26762	35.08143	59.77429	64.00111	67.82065	72.44331
48	26.51059112	28.17701	30.75451	33.09808	35.94913	60.90661	65.17077	69.02259	73.68264
49	27.24934921	28.94065	31.55492	33.93031	36.81822	62.03754	66.33865	70.22241	74.91947
50	27.99074904	29.70668	32.35736	34.76425	37.68865	63.16712	67.50481	71.42020	76.15389
51	28.73471221	30.47505	33.16179	35.59986	38.56038	64.29540	68.66929	72.61599	77.38596
52	29.48116412	31.24567	33.96813	36.43709	39.43339	65.42241	69.83216	73.80986	78.61576
53	30.23003369	32.01849	34.77633	37.27589	40.30762	66.54820	70.99345	75.00186	79.84334
54	30.98125292	32.79345	35.58634	38.11622	41.18304	67.67279	72.15322	76.19205	81.06877
55	31.73475764	33.57048	36.39811	38.95803	42.05962	68.79621	73.31149	77.38047	82.29212
56	32.49048590	34.34952	37.21159	39.80128	42.93734	69.91851	74.46832	78.56716	83.51343
57	33.24837868	35.13053	38.02674	40.64593	43.81615	71.03971	75.62375	79.75219	84.73277
58	34.00837952	35.91346	38.84351	41.49195	44.69603	72.15984	76.77780	80.93559	85.95018
59	34.77043439	36.69825	39.66186	42.33931	45.57695	73.27893	77.93052	82.11741	87.16571
60	35.53449152	37.48485	40.48175	43.18796	46.45889	74.39701	79.08194	83.29768	88.37942
61	36.30050092	38.27323	41.30314	44.03787	47.34182	75.51409	80.23210	84.47644	89.59134
62	37.06841559	39.06333	42.12599	44.88902	48.22571	76.63021	81.38102	85.65373	90.80153
63	37.83818953	39.85513	42.95028	45.74138	49.11054	77.74538	82.52873	86.82959	92.01002
64	38.60977880	40.64856	43.77595	46.59491	49.99629	78.85964	83.67526	88.00405	93.21686
65	39.38314120	41.44361	44.60299	47.44958	50.88294	79.97300	84.82065	89.17715	94.42208
66	40.15823611	42.24023	45.43136	48.30538	51.77047	81.08549	85.96491	90.34890	95.62572
67	40.93502444	43.03838	46.26103	49.16227	52.65885	82.19711	87.10807	91.51936	96.82782

68	41.71346817	43.83803	47.09198	50.02023	53.54807	83.30790	88.25016	92.68854	98.02840
69	42.49353174	44.63916	47.92416	50.87924	54.43810	84.41787	89.39121	93.85647	99.22752
70	43.27517986	45.44172	48.75757	51.73928	55.32894	85.52704	90.53123	95.02318	100.4252
71	44.05837880	46.24568	49.59216	52.60032	56.22056	86.63543	91.67024	96.18870	101.6214
72	44.84309602	47.05103	50.42792	53.46233	57.11295	87.74305	92.80827	97.35305	102.8163

Table 7: Cumulative standard normal distribution

Z	α						
	0	**0.01**	**0.02**	**0.03**	**0.04**	**0.05**	**0.06**
-3.7	0.000107800	0.000112127	0.000116617	0.000121275	0.000126108	0.000131120	0.000136319
-3.6	0.000159109	0.000165339	0.000171797	0.000178491	0.000185427	0.000192616	0.000200064
-3.5	0.000232629	0.000241510	0.000250707	0.000260229	0.000270088	0.000280293	0.000290857
-3.4	0.000336929	0.000349463	0.000362429	0.000375841	0.000389712	0.000404058	0.000418892
-3.3	0.000483424	0.000500937	0.000519035	0.000537737	0.000557061	0.000577025	0.000597648
-3.2	0.000687138	0.000711364	0.000736375	0.000762195	0.000788846	0.000816352	0.000844739
-3.1	0.000967603	0.001000782	0.001035003	0.001070294	0.001106685	0.001144207	0.001182891
-3.0	0.001349898	0.001394887	0.001441242	0.001488999	0.001538195	0.001588870	0.001641061
-2.9	0.001865813	0.001926209	0.001988376	0.002052359	0.002118205	0.002185961	0.002255677
-2.8	0.002555130	0.002635402	0.002717945	0.002802815	0.002890068	0.002979763	0.003071959
-2.7	0.003466974	0.003572601	0.003681108	0.003792562	0.003907033	0.004024589	0.004145301
-2.6	0.004661188	0.004798797	0.004940016	0.005084926	0.005233608	0.005386146	0.005542623
-2.5	0.006209665	0.006387155	0.006569119	0.006755653	0.006946851	0.007142811	0.007343631
-2.4	0.008197536	0.008424186	0.008656319	0.008894043	0.009137468	0.009386706	0.009641870
-2.3	0.010724110	0.011010658	0.011303844	0.011603792	0.011910625	0.012224473	0.012545461
-2.2	0.013903448	0.014262118	0.014628731	0.015003423	0.015386335	0.015777607	0.016177383
-2.1	0.017864421	0.018308900	0.018762766	0.019226172	0.019699270	0.020182215	0.020675163
-2.0	0.022750132	0.023295468	0.023851764	0.024419185	0.024997895	0.025588060	0.026189845
-1.9	0.028716560	0.029378980	0.030054039	0.030741909	0.031442763	0.032156775	0.032884119
-1.8	0.035930319	0.036726956	0.037537980	0.038363570	0.039203903	0.040059157	0.040929509
-1.7	0.044565463	0.045513977	0.046478658	0.047459682	0.048457226	0.049471468	0.050502583
-1.6	0.054799292	0.055917403	0.057053433	0.058207556	0.059379941	0.060570758	0.061780177
-1.5	0.066807201	0.068112118	0.069436623	0.070780877	0.072145037	0.073529260	0.074933700
-1.4	0.080756659	0.082264439	0.083793322	0.085343451	0.086914962	0.088507991	0.090122672
-1.3	0.096800485	0.098525329	0.100272568	0.102042315	0.103834681	0.105649774	0.107487697
-1.2	0.115069670	0.117023196	0.119000107	0.121000484	0.123024403	0.125071936	0.127143151
-1.1	0.135666061	0.137856572	0.14007109	0.142309654	0.144572300	0.146859056	0.149169950
-1.0	0.158655254	0.161087060	0.163543059	0.166023246	0.168527607	0.171056126	0.173608780
-0.9	0.184060125	0.186732943	0.189429655	0.192150202	0.194894521	0.197662543	0.200454193
-0.8	0.211855399	0.214763884	0.217695438	0.220649946	0.223627292	0.226627352	0.229649997
-0.7	0.241963652	0.245097094	0.248252230	0.251428895	0.254626915	0.257846111	0.261086300
-0.6	0.274253118	0.277595325	0.280957309	0.284338849	0.287739719	0.291159687	0.294598516

-0.5	0.308537539	0.312066949	0.315613697	0.319177509	0.322758110	0.326355220	0.329968554
-0.4	0.344578258	0.348268273	0.351972708	0.355691245	0.359423567	0.363169349	0.366928264
-0.3	0.382088578	0.385908119	0.389738752	0.393580127	0.397431887	0.401293674	0.405165128
-0.2	0.420740291	0.424654565	0.428576284	0.432505068	0.436440537	0.440382308	0.444329995
-0.1	0.460172163	0.464143607	0.468118628	0.472096830	0.476077817	0.480061194	0.484046563
0.0	0.500000000	0.503989356	0.507978314	0.511966473	0.515953437	0.519938806	0.523922183
0.1	0.539827837	0.543795313	0.547758426	0.551716787	0.555670005	0.559617692	0.563559463
0.2	0.579259709	0.583166163	0.587064423	0.590954115	0.594834872	0.598706326	0.602568113
0.3	0.617911422	0.621719522	0.625515835	0.629300019	0.633071736	0.636830651	0.640576433
0.4	0.655421742	0.659097026	0.662757273	0.666402179	0.670031446	0.673644780	0.677241890
0.5	0.691462461	0.694974269	0.698468212	0.701944035	0.705401484	0.708840313	0.712260281
0.6	0.725746882	0.729069096	0.732371107	0.735652708	0.738913700	0.742153889	0.745373085
0.7	0.758036348	0.761147932	0.764237502	0.767304908	0.770350003	0.773372648	0.776372708
0.8	0.788144601	0.791029912	0.793891946	0.796730608	0.799545807	0.802337457	0.805105479
0.9	0.815939875	0.818588745	0.821213620	0.823814458	0.826391220	0.828943874	0.831472393
1.0	0.841344746	0.843752355	0.846135770	0.848494997	0.850830050	0.853140944	0.855427700
1.1	0.864333939	0.866500487	0.868643119	0.870761888	0.872856849	0.874928064	0.876975597
1.2	0.884930330	0.886860554	0.888767563	0.890651448	0.892512303	0.894350226	0.896165319
1.3	0.903199515	0.904902082	0.906582491	0.908240864	0.909877328	0.911492009	0.913085038
1.4	0.919243341	0.920730159	0.922196159	0.923641490	0.925066300	0.926470740	0.927854963
1.5	0.933192799	0.934478288	0.935744512	0.936991636	0.938219823	0.939429242	0.940620059
1.6	0.945200708	0.946301072	0.947383862	0.948449252	0.949497417	0.950528532	0.951542774
1.7	0.955434537	0.956367063	0.957283779	0.958184862	0.959070491	0.959940843	0.960796097
1.8	0.964069681	0.964852106	0.965620498	0.966375031	0.967115881	0.967843225	0.968557237
1.9	0.971283440	0.971933393	0.972571050	0.973196581	0.973810155	0.974411940	0.975002105
2.0	0.977249868	0.977784406	0.978308306	0.978821730	0.979324837	0.979817785	0.980300730
2.1	0.982135579	0.982570822	0.982996977	0.983414193	0.983822617	0.984222393	0.984613665
2.2	0.986096552	0.986447419	0.986790616	0.987126279	0.987454539	0.987775527	0.988089375
2.3	0.989275890	0.989555923	0.989829561	0.990096924	0.99035813	0.990613294	0.990862532
2.4	0.991802464	0.992023740	0.992239746	0.992450589	0.992656369	0.992857189	0.993053149
2.5	0.993790335	0.993963442	0.994132258	0.994296874	0.994457377	0.994613854	0.994766392
2.6	0.995338812	0.995472889	0.995603512	0.995730757	0.995854699	0.995975411	0.996092967
2.7	0.996533026	0.996635840	0.996735904	0.996833284	0.996928041	0.997020237	0.997109932
2.8	0.997444870	0.997522925	0.997598818	0.997672600	0.997744323	0.997814039	0.997881795
2.9	0.998134187	0.998192856	0.998249843	0.998305190	0.998358939	0.998411130	0.998461805
3.0	0.998650102	0.998693762	0.998736127	0.998777231	0.998817109	0.998855793	0.998893315
3.1	0.999032397	0.999064563	0.999095745	0.999125968	0.999155261	0.999183648	0.999211154
3.2	0.999312862	0.999336325	0.999359047	0.999381049	0.999402352	0.999422975	0.999442939
3.3	0.999516576	0.999533520	0.999549913	0.999565770	0.999581108	0.999595942	0.999610288
3.4	0.999663071	0.999675186	0.999686894	0.999698209	0.999709143	0.999719707	0.999729912
3.5	0.999767371	0.999775947	0.999784227	0.999792220	0.999799936	0.999807384	0.999814573

3.6	0.999840891	0.999846901	0.999852698	0.999858289	0.999863681	0.999868880	0.999873892
3.7	0.999892200	0.999896370	0.999900389	0.999904260	0.999907990	0.999911583	0.999915043

Table 8: Cumulative Binomial distribution

		Probability								
n	**x**	**0.01**	**0.05**	**0.1**	**0.15**	**0.2**	**0.25**	**0.3**	**0.35**	**0.4**
2	**0**	0.9801	0.9025	0.81	0.7225	0.64	0.5625	0.49	0.4225	0.36
2	**1**	0.9999	0.9975	0.99	0.9775	0.96	0.9375	0.91	0.8775	0.84
2	**2**	1	1	1	1	1	1	1	1	1
3	**0**	0.970299	0.857375	0.729	0.614125	0.512	0.421875	0.343	0.274625	0.216
3	**1**	0.999702	0.99275	0.972	0.93925	0.896	0.84375	0.784	0.71825	0.648
3	**2**	0.999999	0.999875	0.999	0.996625	0.992	0.984375	0.973	0.957125	0.936
3	**3**	1	1	1	1	1	1	1	1	1
4	**0**	0.960596	0.814506	0.6561	0.522006	0.4096	0.316406	0.2401	0.178506	0.1296
4	**1**	0.999408	0.985981	0.9477	0.890481	0.8192	0.738281	0.6517	0.562981	0.4752
4	**2**	0.999996	0.999519	0.9963	0.988019	0.9728	0.949219	0.9163	0.873519	0.8208
4	**3**	1	0.999994	0.9999	0.999494	0.9984	0.996094	0.9919	0.984994	0.9744
4	**4**	1	1	1	1	1	1	1	1	1
5	**0**	0.95099	0.773781	0.59049	0.443705	0.32768	0.237305	0.16807	0.116029	0.07776
5	**1**	0.99902	0.977408	0.91854	0.83521	0.73728	0.632813	0.52822	0.428415	0.33696
5	**2**	0.99999	0.998842	0.99144	0.973388	0.94208	0.896484	0.83692	0.764831	0.68256
5	**3**	1	0.99997	0.99954	0.997773	0.99328	0.984375	0.96922	0.945978	0.91296
5	**4**	1	1	0.99999	0.999924	0.99968	0.999023	0.99757	0.994748	0.98976
5	**5**	1	1	1	1	1	1	1	1	1

Table 9: Cumulative Poisson distribution

x	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**	**0.9**
0	0.904837	0.818731	0.740818	0.670320	0.606531	0.548812	0.496585	0.449329	0.406570
1	0.995321	0.982477	0.963064	0.938448	0.909796	0.878099	0.844195	0.808792	0.772482
2	0.999845	0.998852	0.996401	0.992074	0.985612	0.976885	0.965858	0.952577	0.937143
3	0.999996	0.999943	0.999734	0.999224	0.998248	0.996642	0.994247	0.990920	0.986541
4	1	0.999998	0.999984	0.999939	0.999828	0.999606	0.999214	0.998589	0.997656
5	1	1	0.999999	0.999996	0.999986	0.999961	0.999910	0.999816	0.999657
6	1	1	1	1	0.999999	0.999997	0.999991	0.999979	0.999957
7	1	1	1	1	1	1	0.999999	0.999998	0.999995
8	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1