

统计分布数值表
泊松分布

GB 4086.6—83

Tables for statistical distributions
Poisson distribution

本标准给出统计学中常用的泊松分布的一种数值表，其名称、表距和精度如下：

泊松分布函数表 $\lambda = 0.005 (0.005) 0.3 (0.01) 1 (0.1) 5 (0.2) 15$ 6 位小数

$x = 0, 1, 2, \dots, k$

其中 k 同时满足 $P(k; \lambda) \leq 1 - 5 \times 10^{-7}$

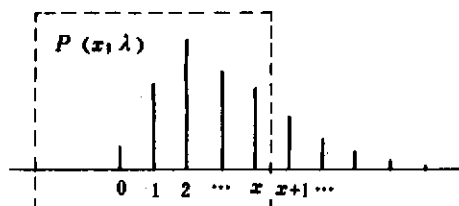
和 $P(k+1; \lambda) > 1 - 5 \times 10^{-7}$

虽然表中给出 6 位小数，但是在使用中需要取几位，要由实际问题决定。

在应用中不能满足要求时，可参考附录的处理方法。

泊松分布函数表

$$P(x; \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



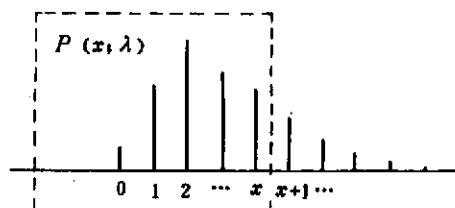
λ	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050
x										
0	0.995012	0.990050	0.985112	0.980199	0.975310	0.970446	0.965605	0.960789	0.955997	0.951229
1	0.999988	0.999950	0.999889	0.999803	0.999693	0.999559	0.999402	0.999221	0.999017	0.998791
2	1.000000	1.000000	0.999999	0.999999	0.999997	0.999996	0.999993	0.999990	0.999985	0.999980
λ	0.055	0.060	0.065	0.070	0.075	0.080	0.085	0.090	0.095	0.100
x										
0	0.946485	0.941765	0.937067	0.932394	0.927743	0.923116	0.918512	0.913931	0.909373	0.904837
1	0.998542	0.998270	0.997977	0.997661	0.997324	0.996966	0.996586	0.996185	0.995763	0.995321
2	0.999973	0.999966	0.999956	0.999946	0.999934	0.999920	0.999904	0.999886	0.999867	0.999845
3	1.000000	0.999999	0.999999	0.999999	0.999999	0.999998	0.999998	0.999997	0.999997	0.999996
λ	0.105	0.110	0.115	0.120	0.125	0.130	0.135	0.140	0.145	0.150
x										
0	0.900325	0.895834	0.891366	0.886920	0.882497	0.878095	0.873716	0.869358	0.865022	0.860708
1	0.994859	0.994376	0.993873	0.993351	0.992809	0.992248	0.991668	0.991068	0.990451	0.989814
2	0.999822	0.999796	0.999767	0.999737	0.999704	0.999668	0.999629	0.999588	0.999544	0.999497
3	0.999995	0.999994	0.999993	0.999992	0.999991	0.999989	0.999988	0.999986	0.999984	0.999981
4	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999
λ	0.155	0.160	0.165	0.170	0.175	0.180	0.185	0.190	0.195	0.200
x										
0	0.856415	0.852144	0.847894	0.843665	0.839457	0.835270	0.831104	0.826959	0.822835	0.818731
1	0.989160	0.988487	0.987796	0.987088	0.986362	0.985619	0.984859	0.984081	0.983287	0.982477
2	0.999447	0.999394	0.999338	0.999279	0.999216	0.999150	0.999081	0.999008	0.998932	0.998852
3	0.999979	0.999976	0.999973	0.999970	0.999966	0.999962	0.999958	0.999953	0.999948	0.999943
4	0.999999	0.999999	0.999999	0.999999	0.999999	0.999999	0.999998	0.999998	0.999998	0.999998
λ	0.205	0.210	0.215	0.220	0.225	0.230	0.235	0.240	0.245	0.250
x										
0	0.814647	0.810584	0.806541	0.802519	0.798516	0.794534	0.790571	0.786628	0.782705	0.778801
1	0.981650	0.980807	0.979948	0.979073	0.978182	0.977276	0.976355	0.975419	0.974467	0.973501
2	0.998768	0.998680	0.998589	0.998494	0.998395	0.998292	0.998185	0.998073	0.997958	0.997839
3	0.999938	0.999931	0.999925	0.999918	0.999911	0.999903	0.999895	0.999886	0.999876	0.999867
4	0.999997	0.999997	0.999997	0.999996	0.999996	0.999996	0.999995	0.999995	0.999994	0.999993
λ	0.255	0.260	0.265	0.270	0.275	0.280	0.285	0.290	0.295	0.300
x										
0	0.774916	0.771052	0.767206	0.763379	0.759572	0.755784	0.752014	0.748264	0.744532	0.740818
1	0.972520	0.971525	0.970516	0.969492	0.968454	0.967403	0.966338	0.965260	0.964168	0.963064
2	0.997715	0.997587	0.997454	0.997317	0.997176	0.997030	0.996879	0.996724	0.996565	0.996401
3	0.999856	0.999845	0.999834	0.999821	0.999809	0.999795	0.999781	0.999766	0.999750	0.999734
4	0.999993	0.999992	0.999991	0.999990	0.999990	0.999989	0.999988	0.999987	0.999985	0.999984
5	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999999	0.999999

本表对于 λ 和 x 给出泊松分布函数 $P(x; \lambda)$ 的数值。

例：对于 $\lambda = 0.275$ 和 $x = 2$ ， $P(x; \lambda) = 0.997176$ 。

泊松分布函数表

$$P(x, \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



$\lambda \backslash x$	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.40
0	0.733447	0.726149	0.718924	0.711770	0.704688	0.697676	0.690734	0.683861	0.677057	0.670320
1	0.960816	0.958517	0.956169	0.953772	0.951329	0.948840	0.946306	0.943729	0.941109	0.938448
2	0.996058	0.995696	0.995314	0.994913	0.994491	0.994049	0.993587	0.993104	0.992599	0.992074
3	0.999699	0.999661	0.999620	0.999575	0.999527	0.999474	0.999418	0.999358	0.999293	0.999224
4	0.999982	0.999979	0.999975	0.999971	0.999967	0.999963	0.999957	0.999952	0.999946	0.999939
5	0.999999	0.999999	0.999999	0.999998	0.999998	0.999998	0.999997	0.999997	0.999996	0.999996
$\lambda \backslash x$	0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.50
0	0.663650	0.657047	0.650509	0.644036	0.637628	0.631284	0.625002	0.618783	0.612626	0.606531
1	0.935747	0.933006	0.930228	0.927412	0.924561	0.921674	0.918753	0.915799	0.912813	0.909796
2	0.991527	0.990958	0.990368	0.989755	0.989121	0.988464	0.987785	0.987083	0.986359	0.985612
3	0.999150	0.999071	0.998988	0.998899	0.998805	0.998705	0.998600	0.998489	0.998372	0.998248
4	0.999931	0.999923	0.999914	0.999905	0.999894	0.999883	0.999871	0.999857	0.999843	0.999828
5	0.999995	0.999995	0.999994	0.999993	0.999992	0.999991	0.999990	0.999989	0.999987	0.999986
6	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999999	0.999999	0.999999
$\lambda \backslash x$	0.51	0.52	0.53	0.54	0.55	0.56	0.57	0.58	0.59	0.60
0	0.600496	0.594521	0.588605	0.582748	0.576950	0.571209	0.565525	0.559898	0.554327	0.548812
1	0.906748	0.903671	0.900566	0.897432	0.894272	0.891086	0.887875	0.884639	0.881380	0.878099
2	0.984843	0.984050	0.983235	0.982397	0.981536	0.980652	0.979745	0.978814	0.977861	0.976885
3	0.998119	0.997983	0.997840	0.997691	0.997534	0.997371	0.997200	0.997021	0.996836	0.996642
4	0.999812	0.999794	0.999775	0.999755	0.999734	0.999711	0.999687	0.999662	0.999634	0.999606
5	0.999984	0.999982	0.999980	0.999978	0.999976	0.999973	0.999971	0.999968	0.999965	0.999961
6	0.999999	0.999999	0.999999	0.999998	0.999998	0.999998	0.999998	0.999997	0.999997	0.999997
$\lambda \backslash x$	0.61	0.62	0.63	0.64	0.65	0.66	0.67	0.68	0.69	0.70
0	0.543351	0.537944	0.532592	0.527292	0.522046	0.516851	0.511709	0.506617	0.501576	0.496585
1	0.874795	0.871470	0.868125	0.864760	0.861376	0.857973	0.854553	0.851117	0.847664	0.844195
2	0.975885	0.974863	0.973817	0.972749	0.971658	0.970543	0.969406	0.968246	0.967064	0.965858
3	0.996440	0.996231	0.996013	0.995787	0.995552	0.995309	0.995057	0.994796	0.994526	0.994247
4	0.999575	0.999543	0.999509	0.999473	0.999435	0.999395	0.999353	0.999309	0.999263	0.999214
5	0.999957	0.999953	0.999949	0.999945	0.999940	0.999935	0.999929	0.999923	0.999917	0.999910
6	0.999996	0.999996	0.999995	0.999995	0.999994	0.999994	0.999993	0.999993	0.999992	0.999991
7	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999999
$\lambda \backslash x$	0.71	0.72	0.73	0.74	0.75	0.76	0.77	0.78	0.79	0.80
0	0.491644	0.486752	0.481909	0.477114	0.472367	0.467666	0.463013	0.458406	0.453845	0.449329
1	0.840712	0.837214	0.833703	0.830178	0.826641	0.823093	0.819533	0.815963	0.812382	0.808792
2	0.964630	0.963380	0.962107	0.960812	0.959495	0.958155	0.956793	0.955410	0.954004	0.952577
3	0.993958	0.993660	0.993352	0.993035	0.992708	0.992371	0.992023	0.991666	0.991298	0.990920
4	0.999164	0.999110	0.999055	0.998996	0.998935	0.998872	0.998805	0.998736	0.998664	0.998589
5	0.999903	0.999895	0.999887	0.999879	0.999869	0.999860	0.999850	0.999839	0.999828	0.999816
6	0.999990	0.999989	0.999988	0.999987	0.999986	0.999985	0.999984	0.999982	0.999981	0.999979
7	0.999999	0.999999	0.999999	0.999999	0.999999	0.999999	0.999998	0.999998	0.999998	0.999998

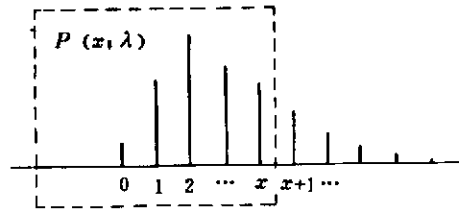
在 x 点的概率 $f(x, \lambda) = P(x, \lambda) - P(x-1, \lambda)$, $x=1, 2, \dots$ 。

例: 对于 $\lambda=0.56$ 和 $x=1$, $f(x, \lambda)=0.319877$ 。

泊松分布函数表

泊松分布函数表

$$P(x, \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



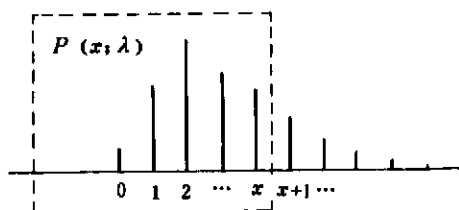
λ x	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
0	0.045049	0.040762	0.036883	0.033373	0.030197	0.027324	0.024724	0.022371	0.020242	0.018316
1	0.184702	0.171201	0.158598	0.146842	0.135888	0.125689	0.116201	0.107380	0.099185	0.091578
2	0.401163	0.379904	0.359426	0.339740	0.320847	0.302747	0.285433	0.268897	0.253125	0.238103
3	0.624840	0.602520	0.580338	0.558357	0.536633	0.515216	0.494153	0.473485	0.453247	0.433470
4	0.798189	0.780613	0.762590	0.744182	0.725445	0.706438	0.687219	0.667844	0.648365	0.628837
5	0.905666	0.894592	0.882877	0.870542	0.857614	0.844119	0.830088	0.815556	0.800558	0.785130
6	0.961196	0.955381	0.949034	0.942147	0.934712	0.926727	0.918191	0.909108	0.899483	0.889326
7	0.985787	0.983170	0.980223	0.976926	0.973261	0.969211	0.964759	0.959893	0.954598	0.948866
8	0.995317	0.994286	0.993088	0.991707	0.990126	0.988329	0.986297	0.984016	0.981467	0.978637
9	0.998599	0.998238	0.997805	0.997291	0.996685	0.995976	0.995152	0.994201	0.993110	0.991868
10	0.999617	0.999503	0.999362	0.999190	0.998981	0.998729	0.998428	0.998071	0.997651	0.997160
11	0.999903	0.999871	0.999829	0.999777	0.999711	0.999630	0.999530	0.999408	0.999261	0.999085
12	0.999977	0.999969	0.999958	0.999943	0.999924	0.999900	0.999870	0.999832	0.999784	0.999726
13	0.999995	0.999993	0.999990	0.999986	0.999981	0.999975	0.999966	0.999955	0.999941	0.999924
14	0.999999	0.999999	0.999998	0.999997	0.999996	0.999994	0.999992	0.999989	0.999985	0.999980
15	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999997	0.999996	0.999995
16	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999
λ x	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
0	0.016573	0.014996	0.013569	0.012277	0.011109	0.010052	0.009095	0.008230	0.007447	0.006738
1	0.084521	0.077977	0.071913	0.066298	0.061099	0.056290	0.051843	0.047733	0.043935	0.040428
2	0.223814	0.210238	0.197355	0.185142	0.173578	0.162639	0.152300	0.142539	0.133331	0.124652
3	0.414182	0.395403	0.377154	0.359448	0.342296	0.325706	0.309684	0.294230	0.279345	0.265026
4	0.609308	0.589827	0.570438	0.551184	0.532104	0.513234	0.494609	0.476259	0.458212	0.440493
5	0.769312	0.753143	0.736663	0.719912	0.702930	0.685760	0.668438	0.651006	0.633501	0.615961
6	0.878648	0.867464	0.855790	0.843645	0.831051	0.818029	0.804605	0.790805	0.776655	0.762183
7	0.942688	0.936057	0.928968	0.921421	0.913414	0.904949	0.896031	0.886666	0.876862	0.866628
8	0.975508	0.972068	0.968302	0.964197	0.959743	0.954928	0.949744	0.944183	0.938239	0.931906
9	0.990460	0.988873	0.987094	0.985110	0.982907	0.980473	0.977794	0.974859	0.971655	0.968172
10	0.996590	0.995931	0.995175	0.994312	0.993331	0.992223	0.990978	0.989583	0.988029	0.986305
11	0.998875	0.998626	0.998334	0.997992	0.997596	0.997137	0.996611	0.996008	0.995323	0.994547
12	0.999655	0.999569	0.999466	0.999342	0.999195	0.999021	0.998817	0.998578	0.998301	0.997981
13	0.999902	0.999874	0.999840	0.999799	0.999748	0.999688	0.999615	0.999527	0.999424	0.999302
14	0.999974	0.999966	0.999955	0.999942	0.999926	0.999907	0.999882	0.999853	0.999817	0.999774
15	0.999993	0.999991	0.999988	0.999984	0.999980	0.999974	0.999966	0.999957	0.999945	0.999931
16	0.999998	0.999998	0.999997	0.999996	0.999995	0.999993	0.999991	0.999988	0.999985	0.999980
17	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999998	0.999997	0.999996	0.999995
18	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999999

在 x 点的概率 $f(x, \lambda) = P(x, \lambda) - P(x-1, \lambda)$, $x=1, 2, \dots$ 。

例：对于 $\lambda=4.90$ 和 $x=7$, $f(x, \lambda)=0.100207$ 。

泊松分布函数表

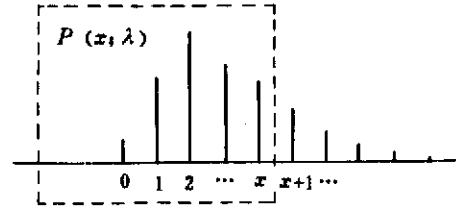
$$P(x, \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



λ x	5.2	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0
0	0.005517	0.004517	0.003698	0.003028	0.002479	0.002029	0.001662	0.001360	0.001114	0.000912
1	0.034203	0.028906	0.024406	0.020587	0.017351	0.014612	0.012296	0.010339	0.008687	0.007295
2	0.108787	0.094758	0.082388	0.071511	0.061969	0.053618	0.046324	0.039968	0.034438	0.029636
3	0.238065	0.213291	0.190622	0.169963	0.151204	0.134229	0.118919	0.105151	0.092806	0.081765
4	0.406128	0.373311	0.342150	0.312718	0.285057	0.259177	0.235070	0.212704	0.192031	0.172992
5	0.580913	0.546132	0.511861	0.478315	0.445680	0.414113	0.383744	0.354673	0.326977	0.300708
6	0.732393	0.701671	0.670258	0.638391	0.606303	0.574213	0.542329	0.510839	0.479916	0.449711
7	0.844922	0.821659	0.796975	0.771026	0.743980	0.716016	0.687321	0.658082	0.628486	0.598714
8	0.918065	0.902650	0.885678	0.867186	0.847237	0.825914	0.803315	0.779557	0.754770	0.729091
9	0.960326	0.951245	0.940870	0.929156	0.916076	0.901621	0.885799	0.868639	0.850184	0.830496
10	0.982301	0.977486	0.971778	0.965099	0.957379	0.948559	0.938589	0.927433	0.915066	0.901479
11	0.992690	0.990368	0.987513	0.984050	0.979908	0.975015	0.969303	0.962709	0.955175	0.946650
12	0.997191	0.996165	0.994856	0.993210	0.991173	0.988684	0.985684	0.982111	0.977903	0.973000
13	0.998992	0.998573	0.998019	0.997297	0.996372	0.995203	0.993749	0.991962	0.989792	0.987189
14	0.999661	0.999502	0.999284	0.998990	0.998600	0.998090	0.997435	0.996605	0.995566	0.994283
15	0.999892	0.999836	0.999756	0.999644	0.999491	0.999284	0.999008	0.998648	0.998184	0.997593
16	0.999968	0.999949	0.999922	0.999882	0.999825	0.999746	0.999638	0.999491	0.999297	0.999042
17	0.999991	0.999985	0.999976	0.999963	0.999943	0.999915	0.999874	0.999818	0.999742	0.999638
18	0.999998	0.999996	0.999993	0.999989	0.999982	0.999973	0.999959	0.999938	0.999910	0.999870
19	0.999999	0.999999	0.999998	0.999997	0.999995	0.999992	0.999987	0.999980	0.999970	0.999956
20	1.000000	1.000000	1.000000	0.999999	0.999999	0.999998	0.999996	0.999994	0.999990	0.999986
21	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999998	0.999997	0.999995
22	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999
7.2	0.000747	0.000611	0.000500	0.000410	0.000335	0.000275	0.000225	0.000184	0.000151	0.000123
7.4	0.006122	0.005135	0.004304	0.003606	0.003019	0.002527	0.002114	0.001767	0.001477	0.001234
7.6	0.025474	0.021871	0.018757	0.016070	0.013754	0.011761	0.010047	0.008576	0.007314	0.006232
7.8	0.071917	0.063153	0.055371	0.048477	0.042380	0.037000	0.032260	0.028093	0.024434	0.021226
8.0	0.155516	0.139525	0.124939	0.111670	0.099632	0.088740	0.078908	0.070054	0.062098	0.054964
8.2	0.275897	0.252557	0.230681	0.210251	0.191236	0.173594	0.157277	0.142228	0.128387	0.115691
8.4	0.420356	0.391962	0.364621	0.338407	0.313374	0.289562	0.266993	0.245676	0.225610	0.206781
8.6	0.568941	0.539333	0.510042	0.481209	0.452961	0.425409	0.398652	0.372771	0.347834	0.323897
8.8	0.702668	0.675651	0.648192	0.620441	0.592547	0.564653	0.536894	0.509397	0.482281	0.455653
9.0	0.809650	0.787735	0.764851	0.741109	0.716624	0.691519	0.665920	0.639951	0.613740	0.587408
9.2	0.886677	0.870677	0.853513	0.835230	0.815886	0.795550	0.774301	0.752228	0.729423	0.705988
9.4	0.937094	0.926474	0.914770	0.901970	0.888076	0.873100	0.857066	0.840008	0.821970	0.803008
9.6	0.967345	0.960883	0.953566	0.945351	0.936203	0.926093	0.915001	0.902916	0.889838	0.875773
9.8	0.984099	0.980469	0.976247	0.971380	0.965819	0.959519	0.952436	0.944533	0.935779	0.926149
10.0	0.992715	0.990822	0.988559	0.985882	0.982743	0.979097	0.974897	0.970098	0.964657	0.958534
10.2	0.996851	0.995929	0.994798	0.993423	0.991769	0.989799	0.987475	0.984755	0.981598	0.977964
10.4	0.998712	0.998291	0.997761	0.997099	0.996282	0.995285	0.994078	0.992633	0.990916	0.988894
10.6	0.999500	0.999320	0.999085	0.998785	0.998406	0.997930	0.997341	0.996618	0.995739	0.994680
10.8	0.999816	0.999742	0.999645	0.999516	0.999350	0.999136	0.998864	0.998522	0.998097	0.997574
11.0	0.999935	0.999907	0.999868	0.999816	0.999747	0.999656	0.999537	0.999384	0.999189	0.998944
11.2	0.999978	0.999968	0.999954	0.999933	0.999906	0.999869	0.999820	0.999755	0.999670	0.999561
11.4	0.999993	0.999989	0.999984	0.999977	0.999967	0.999952	0.999933	0.999906	0.999871	0.999825
11.6	0.999998	0.999997	0.999995	0.999992	0.999989	0.999983	0.999976	0.999966	0.999952	0.999933
11.8	0.999999	0.999999	0.999998	0.999998	0.999996	0.999994	0.999992	0.999988	0.999983	0.999975
12.0	1.000000	1.000000	1.000000	0.999999	0.999999	0.999998	0.999997	0.999996	0.999994	0.999991
12.2	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999997
12.4	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999

泊松分布函数表

$$P(x; \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



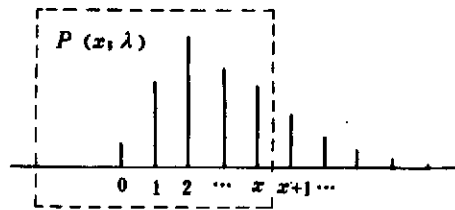
$x \backslash \lambda$	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	10.8	11.0
0	0.000101	0.000083	0.000068	0.000055	0.000045	0.000037	0.000030	0.000025	0.000020	0.000017
1	0.001031	0.000860	0.000718	0.000599	0.000499	0.000416	0.000347	0.000289	0.000241	0.000200
2	0.005307	0.004515	0.003839	0.003262	0.002769	0.002350	0.001993	0.001689	0.001430	0.001211
3	0.018420	0.015967	0.013826	0.011960	0.010336	0.008924	0.007698	0.006635	0.005713	0.004916
4	0.048580	0.042878	0.037795	0.033271	0.029253	0.025688	0.022532	0.019741	0.017277	0.015105
5	0.104074	0.093471	0.083815	0.075041	0.067086	0.059888	0.053387	0.047527	0.042255	0.037520
6	0.189165	0.172733	0.157447	0.143265	0.130141	0.118026	0.106869	0.096616	0.087216	0.078614
7	0.301000	0.279171	0.258428	0.238779	0.220221	0.202743	0.186327	0.170950	0.156583	0.143192
8	0.429609	0.404235	0.379606	0.355783	0.332820	0.310756	0.289623	0.269443	0.250229	0.231985
9	0.561076	0.534858	0.508862	0.483188	0.457930	0.433171	0.408987	0.385446	0.362604	0.340511
10	0.682026	0.657644	0.632948	0.608045	0.583040	0.558034	0.533126	0.508409	0.483969	0.459889
11	0.783185	0.762570	0.741241	0.719281	0.696776	0.673817	0.650494	0.626900	0.603128	0.579267
12	0.860739	0.844762	0.827876	0.810124	0.791556	0.772232	0.752213	0.731568	0.710370	0.688697
13	0.915624	0.904193	0.891852	0.878605	0.864464	0.849450	0.833587	0.816912	0.799464	0.781291
14	0.951691	0.944097	0.935721	0.926542	0.916542	0.905708	0.894037	0.881530	0.868194	0.854044
15	0.973812	0.969103	0.963798	0.957861	0.951260	0.943964	0.935949	0.927193	0.917679	0.907396
16	0.986532	0.983794	0.980643	0.977044	0.972958	0.968353	0.963192	0.957445	0.951082	0.944076
17	0.993416	0.991917	0.990156	0.988102	0.985722	0.982985	0.979858	0.976308	0.972302	0.967809
18	0.996934	0.996160	0.995230	0.994123	0.992813	0.991277	0.989488	0.987416	0.985035	0.982313
19	0.998638	0.998258	0.997793	0.997228	0.996546	0.995729	0.994758	0.993613	0.992272	0.990711
20	0.999421	0.999245	0.999024	0.998750	0.998412	0.997999	0.997499	0.996898	0.996180	0.995329
21	0.999765	0.999686	0.999586	0.999460	0.999300	0.999102	0.998857	0.998556	0.998190	0.997748
22	0.999908	0.999875	0.999832	0.999776	0.999704	0.999613	0.999498	0.999355	0.999177	0.998958
23	0.999966	0.999952	0.999934	0.999911	0.999880	0.999840	0.999788	0.999723	0.999640	0.999536
24	0.999988	0.999982	0.999975	0.999966	0.999953	0.999936	0.999914	0.999885	0.999848	0.999801
25	0.999996	0.999994	0.999991	0.999987	0.999982	0.999976	0.999966	0.999954	0.999939	0.999918
26	0.999999	0.999998	0.999997	0.999996	0.999994	0.999991	0.999987	0.999982	0.999976	0.999967
27	1.000000	0.999999	0.999999	0.999998	0.999998	0.999997	0.999995	0.999993	0.999991	0.999987
28	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999998	0.999997	0.999995
29	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998
30	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999

在 x 点的概率 $f(x; \lambda) = P(x; \lambda) - P(x-1; \lambda)$, $x=1, 2, \dots$

例: 对于 $\lambda=10.0$ 和 $x=20$, $f(x; \lambda)=0.001866$ 。

泊松分布函数表

$$P(x, \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



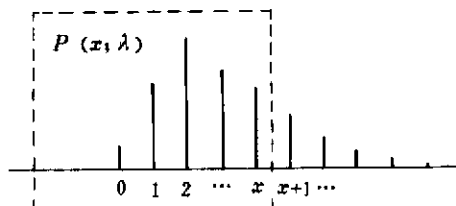
λ x	11.2	11.4	11.6	11.8	12.0	12.2	12.4	12.6	12.8	13.0
0	0.000014	0.000011	0.000009	0.000008	0.000006	0.000005	0.000004	0.000003	0.000003	0.000002
1	0.000167	0.000139	0.000115	0.000096	0.000080	0.000066	0.000055	0.000046	0.000038	0.000032
2	0.001024	0.000866	0.000732	0.000619	0.000522	0.000441	0.000372	0.000314	0.000264	0.000223
3	0.004226	0.003631	0.003117	0.002674	0.002292	0.001963	0.001681	0.001438	0.001229	0.001050
4	0.013192	0.011509	0.010032	0.008736	0.007600	0.006607	0.005738	0.004979	0.004317	0.003740
5	0.033274	0.029473	0.026075	0.023043	0.020341	0.017936	0.015800	0.013903	0.012222	0.010734
6	0.070760	0.063603	0.057092	0.051181	0.045822	0.040974	0.036594	0.032644	0.029086	0.025887
7	0.130739	0.119186	0.108492	0.098612	0.089504	0.081125	0.073430	0.066376	0.059923	0.054028
8	0.214709	0.198393	0.183021	0.168574	0.155028	0.142355	0.130525	0.119506	0.109262	0.099758
9	0.319206	0.298721	0.279081	0.260302	0.242392	0.225356	0.209190	0.193886	0.179433	0.165812
10	0.436242	0.413096	0.390511	0.368540	0.347229	0.326617	0.306734	0.287606	0.269251	0.251682
11	0.555405	0.531629	0.508018	0.484651	0.461597	0.438925	0.416693	0.394958	0.373768	0.353165
12	0.666625	0.644236	0.621609	0.598826	0.575965	0.553104	0.530318	0.507678	0.485252	0.463105
13	0.762445	0.742983	0.722967	0.702462	0.681536	0.660257	0.638698	0.616929	0.595021	0.573045
14	0.839101	0.823392	0.806949	0.789812	0.772025	0.753634	0.734692	0.715255	0.695381	0.675132
15	0.896337	0.884502	0.871896	0.858528	0.844416	0.829580	0.814047	0.797849	0.781022	0.763607
16	0.936403	0.928043	0.918982	0.909206	0.898709	0.887489	0.875547	0.862892	0.849535	0.835493
17	0.962799	0.957242	0.951111	0.944382	0.937034	0.929047	0.920406	0.911100	0.901121	0.890465
18	0.979223	0.975734	0.971817	0.967442	0.962584	0.957214	0.951309	0.944846	0.937804	0.930167
19	0.988905	0.986829	0.984458	0.981764	0.978720	0.975300	0.971477	0.967224	0.962517	0.957331
20	0.994327	0.993154	0.991790	0.990213	0.988402	0.986333	0.983981	0.981323	0.978333	0.974988
21	0.997218	0.996587	0.995840	0.994961	0.993935	0.992742	0.991365	0.989782	0.987974	0.985919
22	0.998690	0.998366	0.997975	0.997508	0.996953	0.996297	0.995526	0.994627	0.993583	0.992378
23	0.999407	0.999248	0.999052	0.998815	0.998527	0.998182	0.997770	0.997281	0.996704	0.996028
24	0.999742	0.999666	0.999573	0.999457	0.999314	0.999140	0.998929	0.998674	0.998369	0.998006
25	0.999891	0.999857	0.999814	0.999760	0.999692	0.999608	0.999504	0.999377	0.999222	0.999034
26	0.999956	0.999941	0.999922	0.999898	0.999867	0.999827	0.999778	0.999717	0.999641	0.999548
27	0.999983	0.999977	0.999968	0.999958	0.999944	0.999927	0.999904	0.999876	0.999840	0.999796
28	0.999993	0.999991	0.999988	0.999983	0.999977	0.999970	0.999960	0.999947	0.999931	0.999911
29	0.999998	0.999997	0.999995	0.999994	0.999991	0.999988	0.999984	0.999978	0.999971	0.999962
30	0.999999	0.999999	0.999998	0.999998	0.999997	0.999995	0.999994	0.999991	0.999988	0.999984
31	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999998	0.999997	0.999995	0.999994
32	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999998
33	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999

本表对于 λ 和 x 给出泊松分布函数 $P(x, \lambda)$ 的数值。

例：对于 $\lambda = 12.4$ 和 $x = 9$ ， $P(x, \lambda) = 0.209190$ 。

泊松分布函数表

$$P(x; \lambda) = \sum_{y=0}^x e^{-\lambda} \frac{\lambda^y}{y!}$$



λ x	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6	14.8	15.0
0	0.000002	0.000002	0.000001	0.000001	0.000001	0.000001	0.000001	0.000000	0.000000	0.000000
1	0.000026	0.000022	0.000018	0.000015	0.000012	0.000010	0.000009	0.000007	0.000006	0.000005
2	0.000188	0.000158	0.000133	0.000112	0.000094	0.000079	0.000066	0.000056	0.000047	0.000039
3	0.000897	0.000765	0.000653	0.000557	0.000474	0.000404	0.000344	0.000292	0.000249	0.000211
4	0.003238	0.002801	0.002421	0.002091	0.001805	0.001557	0.001342	0.001156	0.000996	0.000857
5	0.009418	0.008256	0.007231	0.006327	0.005532	0.004833	0.004218	0.003679	0.003207	0.002792
6	0.023014	0.020439	0.018132	0.016070	0.014228	0.012585	0.011121	0.009818	0.008660	0.007632
7	0.048653	0.043760	0.039313	0.035277	0.031620	0.028310	0.025320	0.022622	0.020190	0.018002
8	0.090958	0.082824	0.075320	0.068409	0.062055	0.056223	0.050879	0.045989	0.041522	0.037446
9	0.153004	0.140985	0.129730	0.119211	0.109399	0.100264	0.091773	0.083895	0.076600	0.069854
10	0.234905	0.218921	0.203729	0.189319	0.175681	0.162801	0.150660	0.139239	0.128515	0.118464
11	0.333186	0.313862	0.295217	0.277272	0.260040	0.243531	0.227749	0.212695	0.198365	0.184752
12	0.441295	0.419878	0.398904	0.378418	0.358458	0.339061	0.320255	0.302066	0.284513	0.267611
13	0.551068	0.529157	0.507377	0.485788	0.464448	0.443410	0.422724	0.402437	0.382589	0.363218
14	0.654568	0.633753	0.612751	0.591624	0.570437	0.549249	0.528121	0.507109	0.486269	0.465654
15	0.745647	0.727191	0.708289	0.688994	0.669360	0.649443	0.629301	0.608990	0.588568	0.568090
16	0.820788	0.805446	0.789497	0.772975	0.755918	0.738366	0.720364	0.701957	0.683193	0.664123
17	0.879133	0.867129	0.854463	0.841148	0.827201	0.812643	0.797499	0.781799	0.765573	0.748859
18	0.921919	0.913049	0.903549	0.893414	0.882643	0.871239	0.859207	0.846559	0.833308	0.819472
19	0.951644	0.945435	0.938684	0.931375	0.923495	0.915031	0.905976	0.896323	0.886070	0.875219
20	0.971263	0.967133	0.962576	0.957569	0.952092	0.946124	0.939649	0.932650	0.925114	0.917029
21	0.983594	0.980978	0.978049	0.974782	0.971156	0.967149	0.962739	0.957906	0.952630	0.946894
22	0.990993	0.989412	0.987614	0.985579	0.983288	0.980719	0.977853	0.974667	0.971141	0.967256
23	0.995240	0.994325	0.993269	0.992057	0.990672	0.989098	0.987315	0.985306	0.983053	0.980535
24	0.997575	0.997068	0.996474	0.995782	0.994980	0.994055	0.992993	0.991779	0.990398	0.988835
25	0.998808	0.998539	0.998218	0.997839	0.997392	0.996870	0.996263	0.995559	0.994747	0.993815
26	0.999434	0.999296	0.999130	0.998930	0.998691	0.998408	0.998074	0.997681	0.997222	0.996688
27	0.999740	0.999672	0.999589	0.999488	0.999365	0.999217	0.999040	0.998829	0.998579	0.998284
28	0.999885	0.999852	0.999812	0.999763	0.999702	0.999627	0.999537	0.999427	0.999296	0.999139
29	0.999950	0.999936	0.999917	0.999893	0.999864	0.999828	0.999783	0.999729	0.999662	0.999582
30	0.999979	0.999973	0.999964	0.999954	0.999940	0.999923	0.999902	0.999875	0.999843	0.999803
31	0.999992	0.999989	0.999985	0.999980	0.999974	0.999967	0.999957	0.999944	0.999929	0.999910
32	0.999997	0.999996	0.999994	0.999992	0.999989	0.999986	0.999982	0.999976	0.999969	0.999960
33	0.999999	0.999998	0.999998	0.999997	0.999996	0.999994	0.999992	0.999990	0.999987	0.999983
34	1.000000	0.999999	0.999999	0.999999	0.999998	0.999998	0.999997	0.999996	0.999994	0.999993
35	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999	0.999998	0.999998	0.999997
36	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	0.999999	0.999999	0.999999

在 x 点的概率 $f(x; \lambda) = P(x; \lambda) - P(x-1; \lambda)$, $x=1, 2, \dots$

例: 对于 $\lambda=15.0$ 和 $x=15$, $f(x; \lambda)=0.102436$ 。

附录 A

计算方法

(参考件)

这里给出泊松分布函数表的计算方法。在本标准所列数表不能满足要求时,可参考这些算法及附录B的程序进行计算,或者使用插值方法作粗略计算。

A.1 泊松分布的定义与记号

若离散型随机变量 $\xi = x$ 的概率为

$$f(x; \lambda) = \frac{\lambda^x}{x!} e^{-\lambda}, \quad \lambda > 0, \quad x = 0, 1, 2, \dots,$$

则称 ξ 服从泊松分布。其分布函数是

$$P(x; \lambda) = \sum_{y=0}^x f(y; \lambda)。$$

A.2 χ^2 分布与泊松分布的关系

A.2.1 χ^2 分布的定义与记号

自由度为 ν 的 χ^2 分布的密度函数是

$$f_{\chi^2}(\chi^2; \nu) = \begin{cases} \frac{1}{2\Gamma(\frac{\nu}{2})} \left(\frac{\chi^2}{2}\right)^{\frac{\nu}{2}-1} e^{-\frac{\chi^2}{2}}, & 0 \leq \chi^2 < \infty, \\ 0, & \chi^2 < 0, \end{cases}$$

$\nu = 1, 2, 3, \dots。$

式中: $\Gamma(a) = \int_0^{\infty} x^{a-1} e^{-x} dx。$

分布函数是

$$P_{\chi^2}(\chi^2; \nu) = \int_0^{\chi^2} f_{\chi^2}(\chi^2; \nu) d\chi^2。$$

A.2.2 χ^2 分布与泊松分布的关系

由分部积分法知泊松分布函数可用 χ^2 分布函数表示, 即

$$\begin{aligned} P(x; \lambda) &= \sum_{y=0}^x f(y; \lambda) = \int_{\lambda}^{\infty} \frac{y^x}{x!} e^{-y} dy \\ &= \int_{2\lambda}^{\infty} f_{\chi^2}(\chi^2; 2(x+1)) d\chi^2 = 1 - P_{\chi^2}(2\lambda; 2(x+1))。 \end{aligned}$$

A.3 计算方法

如上所述,泊松分布函数可转化为 χ^2 分布函数计算。关于 χ^2 分布的计算方法请参考 GB 4086.2—83《统计分布数值表 χ^2 分布》的附录 A.2。

附录 B

计 算 程 序

(参考件)

B.1 说明

这里给出用于本标准实际计算的一个FORTRAN语言子程序:

POIFD: 用于计算泊松分布函数。

程序使用附录A的计算方法,即把泊松分布转化为 χ^2 分布计算。因而需要调用计算 χ^2 分布函数的子程序CHIFD,请参考GB 4086.2附录B。此外, χ^2 分布子程序又需调用正态分布函数子程序NORFD,请参考GB 4086.1—83《统计分布数值表 正态分布》的附录B。

虽然本标准印出的数表只取6位小数,但程序的计算精度通常可达 10^{-10} 。

B.2 程序

C	POIF0001
C=====	POIF0002
C	POIF0003
SUBROUTINE POIFD(K,DLAM,P)	POIF0004
INTEGER K	POIF0005
DOUBLE PRECISION DLAM,P	POIF0006
C	POIF0007
C ** PURPOSE **	POIF0008
C DISTRIBUTION FUNCTION OF POISSON DISTRIBUTION	POIF0009
C	POIF0010
C ** ARGUMENTS **	POIF0011
C ON ENTRY	POIF0012
C K THE POISSON SUM IS TO AND INCLUDING K	POIF0013
C DLAM THE POISSON PARAMETER	POIF0014
C ON RETURN	POIF0015
C P CUMULATIVE PROBABILITY FROM 0 TO K	POIF0016
C	POIF0017
C ** REQUIRED ROUTINES **	POIF0018
C CHIFD DISTRIBUTION FUNCTION OF CHI-SQUARE DISTRIBUTION	POIF0019
C	POIF0020
C ** ALGORITHM **	POIF0021
C P(K,DLAM) = 1 - X2(2*DLAM,2*(K+1))	POIF0022
C WHERE X2 DENOTES DISTRIBUTION FUNCTION OF CHI-SQUARE	POIF0023
C DISTRIBUTION.	POIF0024
C	POIF0025
C-----	POIF0026
C	POIF0027
INTEGER N	POIF0028
DOUBLE PRECISION X2,DENS	POIF0029
C	POIF0030
N = 2*(K + 1)	POIF0031
X2 = 2.000*DLAM	POIF0032
CALL CHIFD(X2,N,P,DENS)	POIF0033
P = 1.000 - P	POIF0034
RETURN	POIF0035
END	POIF0036

附加说明:

本标准由全国统计方法应用标准化技术委员会提出。

本标准由全国统计方法应用标准化技术委员会术语、符号和统计用表分委员会工作组起草。

本标准主要起草人杨自强、魏公毅。