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Tables of Probabilities Associated with the Fission of Replicate Samples in Classifications

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TABLES OF PROBABILITIES ASSOCIATED WITH THE FISSION OF REPLICATE SAMPLES IN CLASSIFICATIONS

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INTRODUCTION

Sandland and Young (In Press) described how, by the use of replicated sampling and combinatorial analysis, it is possible to develop a test of random noise and an objective stopping rule for use in hierarchical classification.

The problem is as follows. We have a number (n) of sites which we wish to classify into an *a priori* unknown number of groups on the basis of a number of variates measured at each of r replicates at each site. It is required that the number of replicates at each site be the same. The questions to be answered are (i) does the hierarchy shown by the classification represent real non-random patterns of intersample similarities? (ii) at which level of the classification does this no longer apply?

The statistic of interest in determining our test and stopping rule is $N(n,r;k)$ which is the number of sites which have all their r replicates in any one group at the k^{th} stage (or on classification into k groups). We are interested in whether the event $N(n,r;k) \geq \ell$ the observed number of sites which have all their replicates in one group, is likely to have arisen by chance when all the data are random noise, i.e. where all the data are replicates of the same situation.

The usual order of the hierarchy is reversed and we consider the fission of one group into two. We start from the point where each individual belongs to the same group and work towards the point where each individual constitutes one group.

The probability is calculated separately for each fission. As each is a split of one group into two, we shall primarily be interested in the probability of the event $N(n_k,r;2) \geq \ell_{k+1}$ where n_k is the number of sites with all their replicates in any one group in the group from the k^{th} stage which is split at the $(k+1)^{th}$ stage and ℓ_{k+1} is the observed number of sites with all their replicates in one of the two new groups formed at the $(k+1)^{th}$ stage. While the paper (Sandland and Young, *ibid.*) gives the formula for the general $P(N(n,r;k) \geq \ell)$, for practical purposes we are only interested in $P(N(n,r;2) \geq \ell)$ and these are the probabilities tabulated here. Each is a measure of the probability of the observed configuration occurring by chance and hence may be used as a test of significance for each fission in the hierarchy.

Sandland and Young (*ibid.*) give the formula for $P(E_k)$, where E_k denotes the event $N(n,r;k) \geq \ell$, as follows:

$$P(E_k) = NF(E_k)/\Delta^k 0^{nr} \qquad (1)$$

where
$$NF(E_k) = \left\{ \binom{n}{\ell} \Delta^k 0^{(n-\ell)r+\ell} - \ell \binom{n}{\ell+1} \Delta^k 0^{(n-\ell-1)r+\ell+1} + \binom{\ell+1}{2}\binom{n}{\ell+2} \Delta^k 0^{(n-\ell-2)r+\ell+2} + \ldots\ldots + (-1)^{n-\ell} \binom{n-1}{n-\ell}\binom{n}{n} \Delta^k 0^n \right\}$$

and
$$\Delta^k 0^{nr} = \sum_{j=0}^{k} \binom{k}{j} (-1)^j (k-j)^{nr}$$

This report tabulates these probabilities for up to 50 sites and up to 5 replicates per site.

To use the tables, at the k^{th} stage find the group which is split into two to give the $(k+1)^{th}$ stage and record the number of sites (N_1) with all their replicates in this group. Then record the number of sites (N_2) with all their replicates in either of the two new groups formed by the fission. $P((N_1,r;2) \geq N_2))$ is then read off from the table and is used to decide whether the data are random noise (at the first stage) or whether the additional classification stage is warranted (at later stages). The full details of how to use the probabilities are found in Sandland and Young (*ibid*).

The tables given here record the probabilities correct to five decimal places, which is adequate for the purpose in hand. If the ratio criterion (Sandland and Young, *ibid.*) is to be used, the probabilities will have to be computed directly from equation (1).

On any page of the table, the probabilities are given only up to the N_2 value for which all probabilities associated with it are zero. For higher values of N_2 and all the N_1 values on that page, the probabilities are zero.

REFERENCE

Sandland, R.L., and Young, P.C. Probabilistic tests and stopping rules associated with hierarchical classification techniques. *Aust. J. Ecol.* (In Press).

NUMBER OF REPLICATES PER SAMPLE 2

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	1	2	3	4	5	6	7	8	9	10
1	0	.71429	.87097	.93701	.96869	.98437	.99219	.99609	.99805	.99902
2	0	.14286	.48387	.68504	.81213	.89057	.93749	.96484	.98047	.98926
3	0	0	.09677	.30709	.49902	.65608	.77341	.85546	.91016	.94531
4	0	0	0	.05512	.18591	.34343	.49994	.63671	.74609	.82812
5	0	0	0	0	.02935	.10894	.22647	.36326	.50000	.62305
6	0	0	0	0	0	.01514	.06239	.14451	.25390	.37695
7	0	0	0	0	0	0	.00769	.03513	.08984	.17187
8	0	0	0	0	0	0	0	.00388	.01952	.05469
9	0	0	0	0	0	0	0	0	.00195	.01074
10	0	0	0	0	0	0	0	0	0	.00097

NUMBER OF REPLICATES PER SAMPLE 2

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	11	12	13	14	15	16	17	18	19	20
1	.99951	.99976	.99988	.99994	.99997	.99998	.99999	1.00000	1.00000	1.00000
2	.99414	.99683	.99829	.99908	.99951	.99974	.99986	.99993	.99996	.99998
3	.96729	.98071	.98877	.99353	.99631	.99791	.99883	.99934	.99964	.99980
4	.88672	.92700	.95386	.97131	.98242	.98936	.99364	.99623	.99779	.99871
5	.72559	.80615	.86658	.91022	.94077	.96159	.97548	.98456	.99039	.99409
6	.50000	.61279	.70947	.78802	.84912	.89494	.92827	.95187	.96822	.97931
7	.27441	.38721	.50000	.60474	.69638	.77275	.83385	.88106	.91647	.94234
8	.11328	.19385	.29053	.39526	.50000	.59819	.68547	.75966	.82036	.86841
9	.03271	.07300	.13342	.21198	.30362	.40181	.50000	.59274	.67620	.74828
10	.00586	.01929	.04614	.08978	.15088	.22725	.31453	.40726	.50000	.58810
11	.00049	.00317	.01123	.02869	.05923	.10506	.16615	.24034	.32380	.41190
12	0	.00024	.00171	.00647	.01758	.03841	.07173	.11894	.17964	.25172
13	0	0	.00012	.00092	.00369	.01064	.02452	.04813	.08353	.13159
14	0	0	0	.00006	.00049	.00209	.00636	.01544	.03178	.05766
15	0	0	0	0	.00003	.00026	.00117	.00377	.00961	.02069
16	0	0	0	0	0	.00002	.00014	.00066	.00221	.00591
17	0	0	0	0	0	0	.00001	.00007	.00036	.00129
18	0	0	0	0	0	0	0	0	.00004	.00020
19	0	0	0	0	0	0	0	0	0	.00002
20	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 2

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	21	22	23	24	25	26	27	28	29	30
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
2	.99999	.99999	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
3	.99989	.99994	.99997	.99998	.99999	.99999	1.00000	1.00000	1.00000	1.00000
4	.99926	.99957	.99976	.99986	.99992	.99996	.99998	.99999	.99999	1.00000
5	.99640	.99783	.99870	.99923	.99954	.99973	.99984	.99991	.99995	.99997
6	.98670	.99155	.99469	.99669	.99796	.99875	.99924	.99954	.99973	.99984
7	.96082	.97376	.98266	.98867	.99268	.99532	.99704	.99814	.99884	.99928
8	.90538	.93310	.95343	.96804	.97836	.98552	.99042	.99373	.99593	.99739
9	.80834	.85686	.89498	.92421	.94612	.96224	.97388	.98215	.98794	.99194
10	.66819	.73827	.79756	.84627	.88524	.91568	.93896	.95642	.96929	.97861
11	.50000	.58409	.66118	.72937	.78782	.83653	.87611	.90753	.93198	.95063
12	.33181	.41591	.50000	.58059	.65498	.72140	.77897	.82754	.86753	.89976
13	.19166	.26173	.33882	.41941	.50000	.57749	.64945	.71421	.77087	.81920
14	.09462	.14314	.20244	.27063	.34502	.42251	.50000	.57472	.64446	.70767
15	.03918	.06690	.10502	.15373	.21218	.27860	.35055	.42528	.50000	.57223
16	.01330	.02624	.04657	.07579	.11476	.16347	.22103	.28579	.35554	.42777
17	.00360	.00845	.01734	.03196	.05388	.08432	.12389	.17246	.22913	.29233
18	.00074	.00217	.00531	.01133	.02164	.03776	.06104	.09247	.13247	.18080
19	.00011	.00043	.00130	.00331	.00732	.01448	.02612	.04358	.06802	.10024
20	.00001	.00006	.00024	.00077	.00204	.00468	.00958	.01785	.03071	.04937
21	0	.00001	.00003	.00014	.00046	.00125	.00296	.00627	.01206	.02139
22	0	0	0	.00002	.00008	.00027	.00076	.00186	.00407	.00806
23	0	0	0	0	.00001	.00004	.00016	.00046	.00116	.00261
24	0	0	0	0	0	.00001	.00002	.00009	.00027	.00072
25	0	0	0	0	0	0	0	.00001	.00005	.00016
26	0	0	0	0	0	0	0	0	.00001	.00003
27	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 2

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	31	32	33	34	35	36	37	38	39	40
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
2	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
3	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
4	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
5	.99998	.99999	.99999	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
6	.99990	.99994	.99997	.99998	.99999	.99999	1.00000	1.00000	1.00000	1.00000
7	.99956	.99973	.99984	.99990	.99994	.99996	.99998	.99999	.99999	1.00000
8	.99834	.99895	.99934	.99959	.99975	.99984	.99990	.99994	.99996	.99998
9	.99466	.99650	.99772	.99853	.99906	.99940	.99962	.99976	.99985	.99991
10	.98528	.98997	.99323	.99548	.99701	.99803	.99872	.99917	.99947	.99966
11	.96462	.97495	.98246	.98785	.99166	.99433	.99618	.99745	.99831	.99889
12	.92519	.94491	.95993	.97119	.97952	.98559	.98996	.99307	.99526	.99679
13	.85948	.89234	.91862	.93928	.95523	.96738	.97648	.98322	.98815	.99171
14	.76344	.81146	.85190	.88526	.91227	.93375	.95056	.96352	.97337	.98076
15	.63995	.70169	.75657	.80424	.84475	.87851	.90613	.92835	.94594	.95965
16	.50000	.56997	.63583	.69620	.75022	.79748	.83800	.87206	.90020	.92307
17	.36005	.43003	.50000	.56792	.63206	.69114	.74431	.79115	.83161	.86591
18	.23656	.29831	.36417	.43208	.50000	.56603	.62859	.68645	.73880	.78520
19	.14052	.18854	.24343	.30380	.36794	.43397	.50000	.56429	.62537	.68209
20	.07481	.10766	.14810	.19576	.24978	.30886	.37141	.43571	.50000	.56269
21	.03538	.05509	.08138	.11474	.15525	.20252	.25569	.31355	.37463	.43731
22	.01472	.02505	.04007	.06072	.08773	.12149	.16200	.20885	.26120	.31791
23	.00534	.01003	.01754	.02881	.04477	.06625	.09387	.12794	.16839	.21480
24	.00166	.00350	.00677	.01215	.02048	.03262	.04944	.07165	.09980	.13409
25	.00044	.00105	.00228	.00452	.00834	.01441	.02352	.03648	.05406	.07693
26	.00010	.00027	.00066	.00147	.00299	.00567	.01004	.01678	.02663	.04035
27	.00002	.00006	.00016	.00041	.00094	.00197	.00382	.00693	.01185	.01924
28	0	.00001	.00003	.00010	.00025	.00060	.00128	.00255	.00474	.00829
29	0	0	.00001	.00002	.00006	.00016	.00038	.00083	.00169	.00321
30	0	0	0	0	.00001	.00003	.00010	.00024	.00053	.00111
31	0	0	0	0	0	.00001	.00002	.00006	.00015	.00034
32	0	0	0	0	0	0	0	.00001	.00004	.00009
33	0	0	0	0	0	0	0	0	.00001	.00002
34	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 2

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	41	42	43	44	45	46	47	48	49	50
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
2	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
3	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
4	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
5	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
6	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
7	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
8	.99999	.99999	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
9	.99994	.99997	.99998	.99999	.99999	.99999	1.00000	1.00000	1.00000	1.00000
10	.99978	.99986	.99991	.99995	.99997	.99998	.99999	.99999	.99999	1.00000
11	.99927	.99953	.99970	.99981	.99988	.99992	.99995	.99997	.99998	.99999
12	.99784	.99856	.99904	.99937	.99959	.99973	.99983	.99989	.99993	.99995
13	.99425	.99604	.99730	.99817	.99877	.99918	.99946	.99964	.99976	.99985
14	.98623	.99024	.99314	.99522	.99670	.99773	.99846	.99896	.99930	.99953
15	.97021	.97822	.98423	.98869	.99195	.99432	.99603	.99724	.99810	.99870
16	.94136	.95579	.96700	.97562	.98215	.98705	.99069	.99336	.99530	.99670
17	.89449	.91793	.93686	.95193	.96377	.97296	.98001	.98535	.98935	.99233
18	.82556	.86002	.88897	.91291	.93242	.94810	.96053	.97027	.97781	.98358
19	.73365	.77960	.81981	.85439	.88365	.90804	.92807	.94430	.95728	.96755
20	.62239	.67802	.72881	.77431	.81435	.84900	.87852	.90329	.92380	.94054
21	.50000	.56119	.61960	.67421	.72426	.76930	.80915	.84384	.87357	.89868
22	.37761	.43881	.50000	.55980	.61700	.67063	.71997	.76456	.80420	.83888
23	.26635	.32198	.38040	.44020	.50000	.55850	.61457	.66727	.71591	.76006
24	.17444	.22040	.27119	.32579	.38300	.44150	.50000	.55728	.61228	.66409
25	.10551	.13998	.18019	.22569	.27574	.32937	.38543	.44272	.50000	.55614
26	.05864	.08207	.11103	.14561	.18565	.23070	.28003	.33273	.38772	.44386
27	.02979	.04421	.06314	.08709	.11635	.15100	.19085	.23544	.28409	.33591
28	.01377	.02178	.03300	.04807	.06758	.09196	.12148	.15616	.19580	.23994
29	.00575	.00976	.01577	.02438	.03623	.05190	.07193	.09671	.12643	.16112
30	.00216	.00396	.00686	.01131	.01785	.02704	.03947	.05570	.07620	.10132
31	.00073	.00144	.00270	.00478	.00805	.01295	.01999	.02973	.04272	.05946
32	.00022	.00047	.00096	.00183	.00330	.00568	.00931	.01465	.02219	.03245
33	.00006	.00014	.00030	.00063	.00123	.00227	.00397	.00664	.01065	.01642
34	.00001	.00003	.00009	.00019	.00041	.00082	.00154	.00276	.00470	.00767
35	0	.00001	.00002	.00005	.00012	.00027	.00054	.00104	.00190	.00330
36	0	0	0	.00001	.00003	.00008	.00017	.00036	.00070	.00130
37	0	0	0	0	.00001	.00002	.00005	.00011	.00023	.00047
38	0	0	0	0	0	0	.00001	.00003	.00007	.00015
39	0	0	0	0	0	0	0	.00001	.00002	.00005
40	0	0	0	0	0	0	0	0	0	.00001
41	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 3

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	1	2	3	4	5	6	7	8	9	10
1	0	.41935	.57647	.68344	.76268	.82202	.86652	.89989	.92492	.94369
2	0	.03226	.15294	.26136	.36715	.46606	.55505	.63292	.69966	.75597
3	0	0	.01176	.05032	.10346	.16943	.24359	.32146	.39932	.47441
4	0	0	0	.00342	.01556	.03759	.07056	.11382	.16573	.22412
5	0	0	0	0	.00092	.00463	.01288	.02730	.04893	.07813
6	0	0	0	0	0	.00024	.00134	.00423	.00999	.01973
7	0	0	0	0	0	0	.00006	.00038	.00134	.00351
8	0	0	0	0	0	0	0	.00002	.00011	.00042
9	0	0	0	0	0	0	0	0	0	.00003
10	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 3

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	11	12	13	14	15	16	17	18	19	20
1	.95776	.96832	.97624	.98218	.98664	.98998	.99248	.99436	.99577	.99683
2	.80290	.84162	.87329	.89903	.91982	.93652	.94989	.96054	.96899	.97569
3	.54480	.60932	.66740	.71887	.76391	.80289	.83630	.86469	.88866	.90874
4	.28670	.35122	.41575	.47866	.53871	.59501	.64698	.69431	.73691	.77484
5	.11463	.15764	.20604	.25847	.31351	.36981	.42611	.48133	.53458	.58516
6	.03433	.05440	.08021	.11167	.14837	.18965	.23469	.28255	.33224	.38283
7	.00756	.01425	.02429	.03827	.05662	.07956	.10708	.13898	.17488	.21422
8	.00119	.00278	.00565	.01031	.01730	.02713	.04024	.05695	.07746	.10181
9	.00013	.00039	.00099	.00215	.00419	.00747	.01238	.01935	.02875	.04093
10	.00001	.00004	.00013	.00034	.00079	.00164	.00310	.00542	.00890	.01386
11	0	0	.00001	.00004	.00012	.00029	.00063	.00124	.00229	.00394
12	0	0	0	0	.00001	.00004	.00010	.00023	.00048	.00094
13	0	0	0	0	0	0	.00001	.00003	.00008	.00018
14	0	0	0	0	0	0	0	0	.00001	.00003
15	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 3

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	21	22	23	24	25	26	27	28	29	30
1	.99762	.99822	.99866	.99900	.99925	.99944	.99958	.99968	.99976	.99982
2	.98097	.98513	.98841	.99097	.99298	.99454	.99577	.99672	.99746	.99804
3	.92548	.93935	.95080	.96020	.96789	.97416	.97926	.98339	.98672	.98940
4	.80832	.83761	.86304	.88498	.90379	.91981	.93340	.94486	.95449	.96255
5	.63258	.67651	.71679	.75335	.78626	.81564	.84168	.86461	.88468	.90213
6	.43341	.48320	.53153	.57784	.62172	.66286	.70105	.73621	.76831	.79740
7	.25637	.30063	.34627	.39259	.43890	.48461	.52917	.57214	.61316	.65195
8	.12991	.16153	.19630	.23380	.27349	.31485	.35729	.40026	.44323	.48571
9	.05615	.07459	.09632	.12132	.14944	.18045	.21405	.24986	.28746	.32640
10	.02063	.02951	.04078	.05466	.07133	.09086	.11325	.13845	.16630	.19659
11	.00642	.00997	.01486	.02134	.02967	.04008	.05278	.06790	.08554	.10573
12	.00169	.00287	.00465	.00720	.01073	.01547	.02162	.02941	.03903	.05066
13	.00037	.00070	.00124	.00209	.00337	.00521	.00778	.01124	.01578	.02159
14	.00007	.00014	.00028	.00052	.00092	.00153	.00245	.00378	.00565	.00818
15	.00001	.00002	.00005	.00011	.00021	.00039	.00067	.00112	.00178	.00275
16	0	0	.00001	.00002	.00004	.00009	.00016	.00029	.00050	.00082
17	0	0	0	0	.00001	.00002	.00003	.00007	.00012	.00022
18	0	0	0	0	0	0	.00001	.00001	.00003	.00005
19	0	0	0	0	0	0	0	0	0	.00001
20	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 3

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	31	32	33	34	35	36	37	38	39	40
1	.99987	.99990	.99992	.99994	.99996	.99997	.99998	.99998	.99999	.99999
2	.99848	.99883	.99910	.99930	.99946	.99959	.99968	.99976	.99981	.99986
3	.99156	.99329	.99468	.99578	.99666	.99736	.99792	.99836	.99871	.99898
4	.96926	.97484	.97945	.98326	.98639	.98896	.99106	.99277	.99417	.99530
5	.91724	.93024	.94139	.95091	.95899	.96584	.97162	.97648	.98055	.98396
6	.82358	.84700	.86781	.88620	.90238	.91653	.92886	.93955	.94878	.95673
7	.68831	.72213	.75335	.78196	.80802	.83161	.85284	.87185	.88877	.90378
8	.52727	.56753	.60618	.64297	.67772	.71029	.74062	.76868	.79447	.81805
9	.36623	.40649	.44675	.48661	.52570	.56370	.60035	.63542	.66873	.70017
10	.22905	.26334	.29913	.33603	.37368	.41168	.44969	.48735	.52437	.56046
11	.12844	.15359	.18103	.21056	.24192	.27486	.30907	.34422	.38000	.41610
12	.06443	.08043	.09872	.11930	.14211	.16707	.19402	.22278	.25314	.28486
13	.02886	.03775	.04842	.06100	.07557	.09221	.11092	.13170	.15447	.17913
14	.01153	.01586	.02134	.02811	.03633	.04614	.05766	.07097	.08615	.10323
15	.00411	.00596	.00844	.01166	.01577	.02091	.02722	.03483	.04387	.05444
16	.00130	.00200	.00299	.00435	.00618	.00858	.01166	.01555	.02037	.02624
17	.00037	.00060	.00095	.00146	.00218	.00318	.00453	.00632	.00862	.01156
18	.00009	.00016	.00027	.00044	.00070	.00107	.00160	.00233	.00333	.00465
19	.00002	.00004	.00007	.00012	.00020	.00032	.00051	.00078	.00117	.00171
20	0	.00001	.00002	.00003	.00005	.00009	.00015	.00024	.00037	.00057
21	0	0	0	.00001	.00001	.00002	.00004	.00007	.00011	.00017
22	0	0	0	0	0	0	.00001	.00002	.00003	.00005
23	0	0	0	0	0	0	0	0	.00001	.00001
24	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 3

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	41	42	43	44	45	46	47	48	49	50
1	.99999	.99999	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
2	.99989	.99992	.99993	.99995	.99996	.99997	.99998	.99998	.99999	.99999
3	.99920	.99937	.99951	.99962	.99970	.99976	.99982	.99986	.99989	.99991
4	.99622	.99697	.99757	.99805	.99845	.99876	.99901	.99921	.99937	.99950
5	.98679	.98915	.99111	.99272	.99406	.99515	.99605	.99679	.99740	.99789
6	.96353	.96935	.97430	.97850	.98206	.98506	.98758	.98970	.99147	.99296
7	.91701	.92864	.93882	.94769	.95539	.96206	.96781	.97275	.97699	.98061
8	.83948	.85886	.87631	.89194	.90587	.91825	.92920	.93885	.94733	.95475
9	.72964	.75710	.78254	.80598	.82747	.84707	.86487	.88095	.89543	.90840
10	.59539	.62895	.66099	.69137	.72003	.74689	.77193	.79517	.81661	.83632
11	.45219	.48799	.52323	.55767	.59109	.62333	.65422	.68365	.71152	.73780
12	.31767	.35130	.38547	.41991	.45435	.48853	.52223	.55523	.58733	.61838
13	.20556	.23359	.26302	.29363	.32520	.35749	.39025	.42324	.45624	.48901
14	.12221	.14305	.16568	.19002	.21592	.24324	.27180	.30141	.33187	.36296
15	.06664	.08053	.09616	.11354	.13266	.15347	.17592	.19989	.22527	.25192
16	.03329	.04163	.05135	.06255	.07530	.08964	.10560	.12318	.14236	.16308
17	.01523	.01975	.02522	.03175	.03945	.04841	.05872	.07044	.08362	.09831
18	.00638	.00859	.01138	.01484	.01907	.02416	.03023	.03735	.04562	.05512
19	.00244	.00343	.00472	.00638	.00850	.01114	.01440	.01835	.02310	.02873
20	.00086	.00125	.00180	.00253	.00349	.00474	.00634	.00836	.01086	.01392
21	.00027	.00042	.00063	.00092	.00132	.00186	.00258	.00352	.00473	.00626
22	.00008	.00013	.00020	.00031	.00046	.00068	.00097	.00138	.00191	.00262
23	.00002	.00004	.00006	.00009	.00015	.00023	.00034	.00050	.00072	.00102
24	.00001	.00001	.00002	.00003	.00004	.00007	.00011	.00017	.00025	.00037
25	0	0	0	.00001	.00001	.00002	.00003	.00005	.00008	.00012
26	0	0	0	0	0	.00001	.00001	.00001	.00002	.00004
27	0	0	0	0	0	0	0	0	.00001	.00001
28	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 4

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	1	2	3	4	5	6	7	8	9	10
1	0	.22835	.32975	.41380	.48709	.55120	.60730	.65639	.69934	.73692
2	0	.00787	.04250	.07883	.12073	.16652	.21461	.26370	.31278	.36110
3	0	0	.00147	.00705	.01605	.02914	.04631	.06735	.09189	.11950
4	0	0	0	.00021	.00110	.00297	.00624	.01125	.01826	.02746
5	0	0	0	0	.00003	.00016	.00051	.00123	.00248	.00445
6	0	0	0	0	0	0	.00002	.00009	.00023	.00051
7	0	0	0	0	0	0	0	0	.00001	.00004
8	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 4

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	11	12	13	14	15	16	17	18	19	20
1	.76981	.79858	.82376	.84579	.86507	.88193	.89669	.90960	.92090	.93079
2	.40808	.45330	.49646	.53737	.57592	.61207	.64580	.67716	.70622	.73305
3	.14970	.18200	.21591	.25098	.28678	.32292	.35906	.39491	.43019	.46469
4	.03897	.05281	.06896	.08733	.10778	.13016	.15425	.17986	.20674	.23467
5	.00733	.01129	.01648	.02304	.03107	.04066	.05185	.06465	.07905	.09501
6	.00100	.00179	.00298	.00467	.00696	.00998	.01381	.01857	.02433	.03117
7	.00010	.00021	.00041	.00073	.00122	.00194	.00295	.00430	.00609	.00837
8	.00001	.00002	.00004	.00009	.00017	.00030	.00051	.00081	.00125	.00185
9	0	0	0	.00001	.00002	.00004	.00007	.00012	.00021	.00034
10	0	0	0	0	0	0	.00001	.00002	.00003	.00005
11	0	0	0	0	0	0	0	0	0	.00001
12	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 4

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	21	22	23	24	25	26	27	28	29	30
1	.93944	.94701	.95364	.95943	.96450	.96894	.97282	.97622	.97919	.98179
2	.75777	.78048	.80130	.82034	.83772	.85357	.86799	.88110	.89299	.90376
3	.49824	.53068	.56190	.59183	.62039	.64756	.67331	.69764	.72058	.74213
4	.26342	.29277	.32251	.35244	.38236	.41211	.44154	.47051	.49891	.52661
5	.11247	.13134	.15152	.17289	.19533	.21871	.24289	.26772	.29307	.31880
6	.03915	.04831	.05869	.07029	.08312	.09715	.11234	.12866	.14604	.16442
7	.01122	.01471	.01891	.02388	.02968	.03636	.04396	.05251	.06203	.07253
8	.00267	.00374	.00511	.00683	.00896	.01155	.01465	.01832	.02259	.02752
9	.00053	.00080	.00116	.00166	.00230	.00314	.00419	.00550	.00710	.00904
10	.00009	.00014	.00022	.00034	.00051	.00073	.00103	.00143	.00193	.00258
11	.00001	.00002	.00004	.00006	.00010	.00015	.00022	.00032	.00046	.00064
12	0	0	.00001	.00001	.00002	.00003	.00004	.00006	.00010	.00014
13	0	0	0	0	0	0	.00001	.00001	.00002	.00003
14	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 4

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	31	32	33	34	35	36	37	38	39	40
1	.98407	.98606	.98780	.98933	.99066	.99183	.99285	.99374	.99453	.99521
2	.91352	.92234	.93030	.93749	.94397	.94981	.95506	.95978	.96403	.96784
3	.76233	.78123	.79887	.81530	.83057	.84475	.85788	.87003	.88125	.89159
4	.55355	.57965	.60485	.62910	.65238	.67465	.69591	.71616	.73539	.75362
5	.34478	.37087	.39697	.42295	.44872	.47418	.49924	.52382	.54786	.57131
6	.18372	.20385	.22473	.24626	.26835	.29089	.31380	.33698	.36034	.38378
7	.08402	.09648	.10990	.12425	.13950	.15561	.17252	.19018	.20853	.22751
8	.03315	.03951	.04663	.05454	.06325	.07278	.08314	.09431	.10629	.11907
9	.01135	.01407	.01725	.02092	.02512	.02989	.03525	.04124	.04787	.05517
10	.00339	.00438	.00559	.00705	.00878	.01083	.01321	.01597	.01912	.02272
11	.00089	.00120	.00160	.00210	.00272	.00347	.00439	.00550	.00680	.00834
12	.00020	.00029	.00040	.00055	.00074	.00099	.00130	.00169	.00216	.00274
13	.00004	.00006	.00009	.00013	.00018	.00025	.00034	.00046	.00062	.00081
14	.00001	.00001	.00002	.00003	.00004	.00006	.00008	.00011	.00016	.00022
15	0	0	0	.00001	.00001	.00001	.00002	.00003	.00004	.00005
16	0	0	0	0	0	0	0	.00001	.00001	.00001
17	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 4

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	41	42	43	44	45	46	47	48	49	50
1	.99581	.99633	.99679	.99719	.99754	.99785	.99812	.99835	.99856	.99874
2	.97126	.97433	.97708	.97954	.98175	.98372	.98549	.98707	.98848	.98974
3	.90112	.90989	.91795	.92534	.93211	.93832	.94399	.94918	.95392	.95824
4	.77087	.78715	.80249	.81692	.83048	.84318	.85507	.86619	.87656	.88623
5	.59409	.61619	.63756	.65818	.67802	.69708	.71534	.73281	.74948	.76537
6	.40722	.43058	.45378	.47675	.49943	.52175	.54367	.56513	.58609	.60651
7	.24704	.26706	.28750	.30829	.32935	.35061	.37200	.39346	.41492	.43631
8	.13263	.14693	.16195	.17764	.19397	.21089	.22836	.24631	.26471	.28348
9	.06316	.07184	.08123	.09132	.10211	.11359	.12575	.13858	.15205	.16613
10	.02677	.03132	.03639	.04199	.04816	.05490	.06224	.07018	.07873	.08789
11	.01014	.01222	.01461	.01733	.02041	.02388	.02776	.03207	.03683	.04207
12	.00344	.00428	.00527	.00644	.00780	.00938	.01119	.01326	.01561	.01827
13	.00105	.00135	.00172	.00216	.00270	.00333	.00409	.00498	.00601	.00721
14	.00029	.00039	.00051	.00066	.00085	.00108	.00136	.00170	.00211	.00260
15	.00007	.00010	.00014	.00018	.00024	.00032	.00041	.00053	.00068	.00086
16	.00002	.00002	.00003	.00005	.00006	.00008	.00011	.00015	.00020	.00026
17	0	0	.00001	.00001	.00001	.00002	.00003	.00004	.00005	.00007
18	0	0	0	0	0	0	.00001	.00001	.00001	.00002
19	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 5

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	1	2	3	4	5	6	7	8	9	10
1	0	.11937	.17598	.22752	.27580	.32107	.36350	.40328	.44058	.47554
2	0	.00196	.01117	.02153	.03440	.04949	.06647	.08503	.10492	.12590
3	0	0	.00018	.00093	.00222	.00423	.00706	.01077	.01541	.02101
4	0	0	0	.00001	.00007	.00021	.00046	.00087	.00149	.00236
5	0	0	0	0	0	.00001	.00002	.00005	.00010	.00018
6	0	0	0	0	0	0	0	0	0	.00001
7	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 5

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	11	12	13	14	15	16	17	18	19	20
1	.50832	.53905	.56786	.59487	.62019	.64393	.66618	.68704	.70660	.72494
2	.14775	.17029	.19333	.21674	.24038	.26411	.28785	.31150	.33497	.35820
3	.02756	.03507	.04353	.05289	.06313	.07421	.08608	.09869	.11199	.12592
4	.00353	.00503	.00691	.00919	.01193	.01513	.01882	.02302	.02775	.03302
5	.00032	.00052	.00080	.00118	.00168	.00232	.00312	.00411	.00529	.00669
6	.00002	.00004	.00007	.00012	.00018	.00028	.00040	.00057	.00079	.00108
7	0	0	0	.00001	.00002	.00003	.00004	.00006	.00010	.00014
8	0	0	0	0	0	0	0	.00001	.00001	.00001
9	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 5

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	21	22	23	24	25	26	27	28	29	30
1	.74213	.75825	.77336	.78752	.80080	.81325	.82492	.83587	.84613	.85574
2	.38112	.40368	.42584	.44756	.46881	.48956	.50979	.52949	.54863	.56723
3	.14044	.15548	.17100	.18692	.20321	.21981	.23667	.25374	.27098	.28833
4	.03882	.04517	.05207	.05950	.06746	.07595	.08494	.09442	.10438	.11479
5	.00834	.01024	.01243	.01490	.01769	.02080	.02425	.02804	.03219	.03670
6	.00143	.00186	.00238	.00301	.00375	.00462	.00564	.00680	.00813	.00963
7	.00020	.00027	.00037	.00050	.00066	.00085	.00109	.00137	.00171	.00211
8	.00002	.00003	.00005	.00007	.00010	.00013	.00018	.00023	.00030	.00039
9	0	0	.00001	.00001	.00001	.00002	.00002	.00003	.00005	.00006
10	0	0	0	0	0	0	0	0	.00001	.00001
11	0	0	0	0	0	0	0	0	0	0

NUMBER OF REPLICATES PER SAMPLE 5

-N1- NUMBER OF SITES WITH ALL REPLICATES IN THE ORIGINAL GROUP

-N2- NUMBER OF SITES WITH ALL REPLICATES IN ONLY ONE OF THE TWO SUBGROUPS FORMED ON FISSION OF THE ORIGINAL

-N2-	-N1-									
	31	32	33	34	35	36	37	38	39	40
1	.86476	.87321	.88114	.88856	.89553	.90206	.90818	.91392	.91930	.92434
2	.58526	.60273	.61963	.63598	.65176	.66700	.68169	.69585	.70948	.72259
3	.30576	.32323	.34070	.35813	.37550	.39276	.40990	.42689	.44370	.46031
4	.12564	.13690	.14854	.16055	.17290	.18556	.19851	.21173	.22517	.23883
5	.04158	.04684	.05247	.05847	.06485	.07160	.07873	.08621	.09406	.10225
6	.01132	.01321	.01532	.01764	.02019	.02298	.02602	.02931	.03287	.03669
7	.00258	.00313	.00376	.00448	.00530	.00623	.00728	.00845	.00975	.01120
8	.00050	.00063	.00079	.00097	.00119	.00145	.00175	.00209	.00249	.00294
9	.00008	.00011	.00014	.00018	.00023	.00029	.00036	.00045	.00055	.00067
10	.00001	.00002	.00002	.00003	.00004	.00005	.00007	.00008	.00011	.00014
11	0	0	0	0	.00001	.00001	.00001	.00001	.00002	.00002
12	0	0	0	0	0	0	0	0	0	0

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