

Benchmarks

PermutationTests.jl

All tests performed on an old laptop running under Windows 10
equipped with a Intel(R) Core(TM) i7-8650U CPU @ 1.90GHz and 32Go of RAM

Univariate Tests

Benchmarks with group numerosity 9, 90, 900 and 9000 (N).
All tests are done with 10000 random permutations

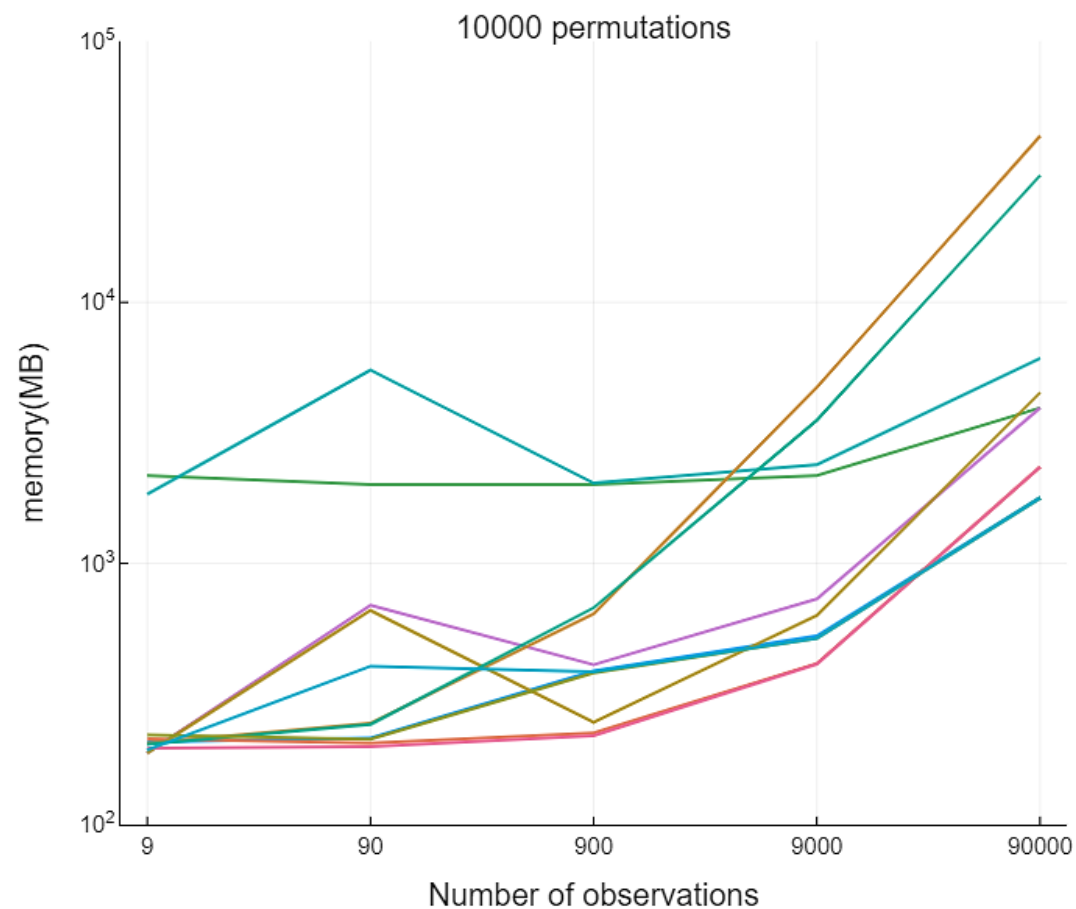
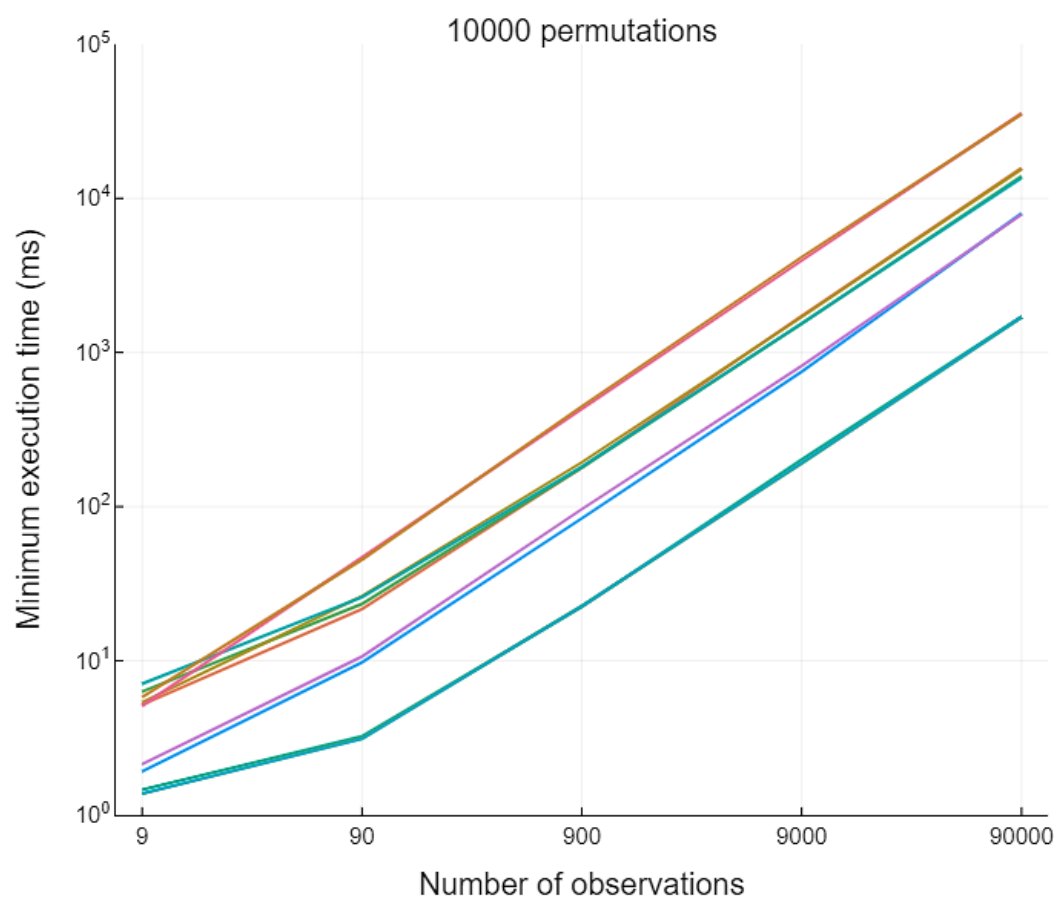
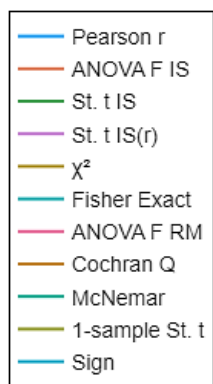
Minumum Execution Time (ms), 10000 Random Permutations

N	Pearson r	ANOVA F IS	St. t IS	St. t IS(r)	χ^2	Fisher Exact	ANOVA F RM	Cochran Q	McNemar	1-sample St. t	Sign
9.0	1.91	5.18	6.30	2.1353	5.3717	7.0899	5.1058	5.8288	1.4561	1.3722	1.3773
90.0	9.74	21.57	23.36	10.6453	26.3142	25.7954	46.874	45.3503	3.2261	3.1339	3.1119
900.0	83.90	179.28	179.34	96.2193	193.66	181.589	435.437	447.344	22.3674	22.6735	22.669
9000.0	751.87	1730.80	1537.44	818.31	1700.49	1542.58	3952.87	4156.55	202.053	191.144	191.801
90000.0	7999.60	15700.21	13919.89	7863.08	15477.1	13601.6	35645.7	35178.4	1703.14	1692.79	1698.51

Memory Allocations (MB), 10000 Random Permutations

N	Pearson r	ANOVA F IS	St. t IS	St. t IS(r)	χ^2	Fisher Exact	ANOVA F RM	Cochran Q	McNemar	1-sample St. t	Sign
9	207.00	213.00	2167.00	188	188	1843	196	205	203	220	193
90	214.00	205.00	2002.00	692	660	5506	199	244	242	212	404
900	387.00	224.00	2003.00	409	246	2031	219	640	676	381	384
9000	527.00	414.00	2169.00	731	632	2386	412	4727	3536	516	516
90000	1787.00	2343.00	3943.00	3941	4504	6104	2341	43418	30606	1781	1781

With 9000 observations all tests executes withn 4s, with the Correlation/trend test, all t-tests, McNemar test and sign test executing within 1s.



The execution time increases linearly with the number of observations (N)

Multiple Comparisons Tests

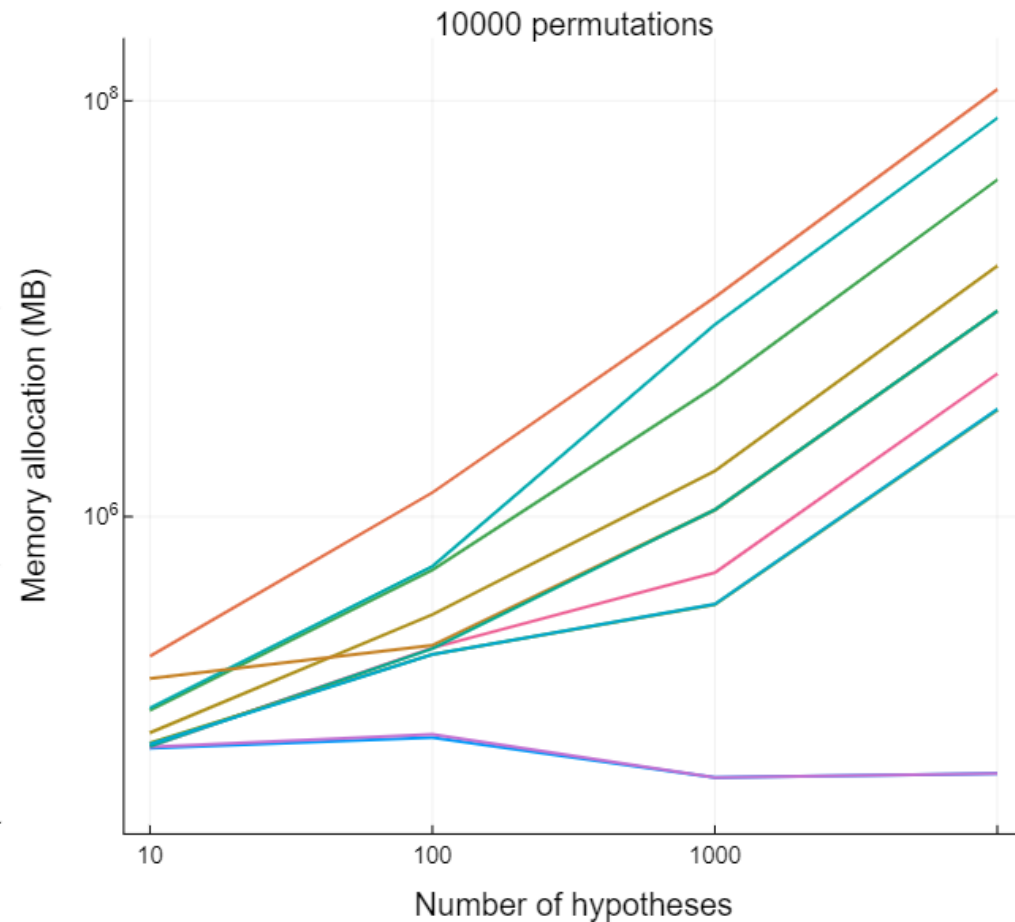
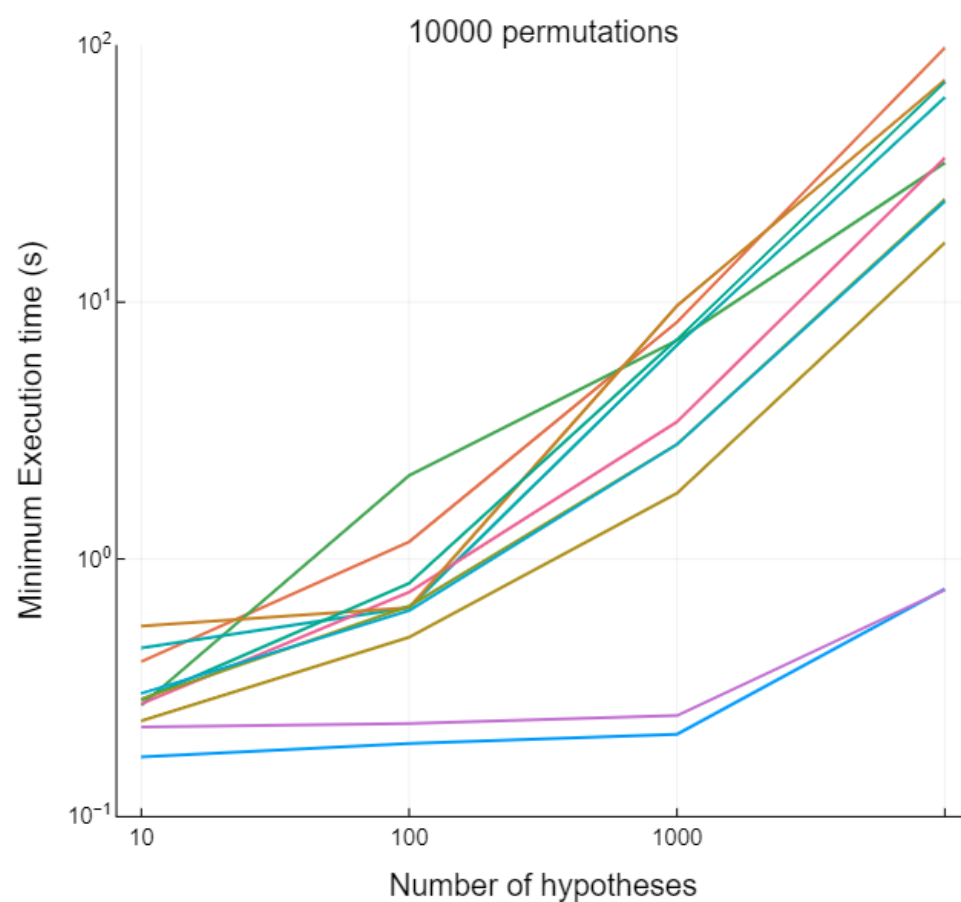
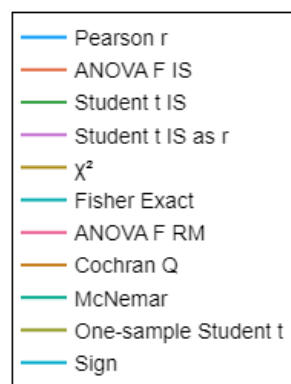
Benchmarks with group numerosity 12 and 10, 100, 1000 and 1000 hypotheses (M).
All tests are done with 10000 random permutations

Minumum Execution Time (s), 10000 Random Permutations, N=12

M	Pearson r	ANOVA F IS	St. t IS	St. t IS(r)	χ^2	Fisher Exact	ANOVA F RM	Cochran Q	McNemar	St. t 1S	Sign
10.0	0.17	0.40	0.27	0.221755	0.23439	0.450104	0.273066	0.547451	0.28335	0.284664	0.29974
100.0	0.19	1.17	2.12	0.229119	0.495845	0.647072	0.742119	0.647223	0.803402	0.655089	0.629479
1000.0	0.21	8.35	7.09	0.245761	1.80459	6.80619	3.42105	9.68136	7.14701	2.79928	2.79595
10000.0	0.76	97.80	34.90	0.758525	17.0394	62.7513	36.3937	73.2516	71.8083	25.1375	24.6486

Memory Allocations (MB), 10000 Random Permutations, N=12

M	Pearson r	ANOVA F IS	St. t IS	St. t IS(r)	χ^2	Fisher Exact	ANOVA F RM	Cochran Q	McNemar	St. t 1S	Sign
10	76787.00	213268.00	116994.00	78017	91196	119961	78642	166178	78533	81500	80233
100	86660.00	1305871.00	554846.00	89519	337558	576959	233632	239880	231394	217729	216990
1000	55501.00	11350601.00	4215326.00	55501	1656287	8376798	537172	1076096	1077375	376932	379277
10000	58165.00	113590246.00	41656479.00	58166	16066080	82638827	4862803	9745800	9746761	3258464	3281515



Correlations and t-tests for independent samples execute within one second