countH\_Pseudo\_Perm: The Hotelling's T^2 with pseudo inverse of correlation matrix and permutation p-value.

countG: The global test.

countG\_Perm: The global test with permutation p-value.

countGlobalAncova: The global ANCOVA test with permutation p-value.

countN\_Perm: The energy test(N-statistic) with permutation p-value.

countGSEA\_Category: The GSEA-like test(in Category package) with permutation p-value.

## Mixture of Normal with different mean setting(0, 1) using fixed mean difference

using fixed mean difference	countH_Pseudo_Perm	countG	countG_Perm	countGlobalAncova	countN_Perm	countGSEA_Category_
composition:0.5 0.5 ,rho:0.1 0.9 ,probes:30,size:50,difference:0.1	0.057	0.076	0.076	0.065	0.078	0.077
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 50, difference: 0.3	0.104	0.231	0.227	0.214	0.21	0.229
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 50, difference: 0.5	0.199	0.499	0.496	0.483	0.482	0.495
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 50, difference: 0.7	0.382	0.789	0.786	0.775	0.769	0.787
composition:0.5 0.5 ,rho:0.1 0.9 ,probes:30,size:50,difference:0.9	0.602	0.942	0.939	0.934	0.935	0.941
composition:0.5 0.5 ,rho:0.1 0.9 ,probes:30,size:50,difference:1	0.697	0.972	0.969	0.97	0.97	0.972
composition:0.5 0.5 ,rho:0.1 0.9 ,probes:30,size:50,difference:2	1	1	1	1	1	1
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 70, difference: 0.1	0.078	0.088	0.086	0.079	0.084	0.09
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 70, difference: 0.3	0.122	0.312	0.31	0.294	0.275	0.307
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 70, difference: 0.5	0.254	0.643	0.64	0.631	0.608	0.645
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 70, difference: 0.7	0.463	0.904	0.904	0.889	0.898	0.903
composition: 0.5 0.5 ,rho: 0.1 0.9 ,probes: 30, size: 70, difference: 0.9	0.711	0.989	0.988	0.988	0.983	0.987
composition:0.5 0.5 ,rho:0.1 0.9 ,probes:30,size:70,difference:1	0.816	0.995	0.995	0.995	0.996	0.995
composition:0.5 0.5 ,rho:0.1 0.9 ,probes:30,size:70,difference:2	1	1	1	1	1	1