

## Poker Cards Analysis - January 2020

### The Directors

GVC Plc

This is to confirm that iTech Labs has examined the game logs for Poker games for the period **January 01, 2020** to **January 31, 2020** as recorded by the respective game servers and analyzed the Poker cards for statistical randomness. The results of the analysis are given below.

**URLs:** <https://www.bwin.be/>, <https://www.bwin.dk/>, <https://www.bwin.es/>, <https://www.bwin.fr/>, <https://www.bwin.it/>, <https://www.premiumbull.com/>, <https://www.bwin.gr/>, <https://www.bwin.com/>, <https://www.party poker.cz/>, <https://da.party poker.com/>, <https://danskespil.dk/>, <https://www.party poker.fr/>, <https://www.giocodigitale.it/>, <https://www.br.betboo.com/en/>, <https://www.party premium.com/>, <https://www.party poker.es/en/>, <https://www.party poker.com/>, <https://sports.premium.com/en/sports/>, <https://poker.party poker.se/sv/poker/>, <https://sports.sportingbet.com/en/sports/>, <https://sports.sportingbet.gr/el/sports/>, <https://www.sh.bwin.de/>, <https://sports.vistabet.com/el/sports/>, <https://sports.sportingbet.co.za/en/sports/>

### 1. Poker hand types statistics

These calculations were done for Royal Flush, Straight Flush, Four of a Kind, Full House, Flush, Straight, 3 of a Kind, 2 pairs, 1 Pair, High Card.

The Poker hand types analysis involved creating subsets of data and conducting Chi-square tests on each subset.

The null hypothesis for the chi-square test is that the observed frequencies of each type of hand matches the theoretical values for a deck that has been shuffled using a perfect random number generator. The p-values observed in these multiple tests are expected to follow a uniform distribution for the range 0.0 to 1.0.

The analysis performs a KS Test (Kolmogorov-Smirnov test) for uniform distribution on the observed p-values, and the combined p-value result of this test is taken as the final result of the Poker hand types statistics tests.

#### 1.1 Poker hand types statistics for 52 cards deck:

Test No.	DOF	ChiSqr	P-Value
1	9	6.23	0.71659
2	9	10.29	0.32744
3	9	8.19	0.51512
4	9	5.20	0.81695
5	9	6.70	0.66880
6	9	5.78	0.76214
7	9	13.39	0.14578
8	9	6.69	0.66952
9	9	11.28	0.25677
10	9	3.69	0.93058
11	9	8.37	0.49769
12	9	9.21	0.41817
13	9	6.14	0.72594
14	9	10.66	0.30005
15	9	7.25	0.61141
16	9	7.95	0.53896
17	9	5.23	0.81349
18	9	17.77	0.03792
19	9	9.95	0.35437
20	9	16.74	0.05293
21	9	12.87	0.16837

22	9	6.99	0.63815
23	9	6.98	0.63969
24	9	7.13	0.62360
25	9	7.25	0.61091
26	9	6.79	0.65852
27	9	10.89	0.28358
28	9	6.21	0.71898
29	9	13.28	0.15031
30	9	5.27	0.81008
31	9	9.39	0.40208
32	9	6.34	0.70544
33	9	8.35	0.49958
34	9	16.43	0.05835
35	9	4.62	0.86599
36	9	6.04	0.73641
37	9	12.83	0.17065
38	9	2.61	0.97774
39	9	6.45	0.69445
40	9	9.96	0.35384
41	9	12.40	0.19151
42	9	7.34	0.60189
43	9	6.28	0.71136
44	9	8.35	0.49919
45	9	10.31	0.32584
46	9	7.09	0.62771
47	9	5.34	0.80328
48	9	11.37	0.25135
49	9	9.31	0.40878
50	9	8.18	0.51619
51	9	8.02	0.53243
52	9	7.66	0.56882
53	9	5.45	0.79339
54	9	11.64	0.23412
55	9	4.04	0.90896
56	9	8.39	0.49574
57	9	2.52	0.98043
58	9	6.90	0.64775
59	9	10.86	0.28536
60	9	11.97	0.21493
61	9	8.96	0.44114
62	9	3.42	0.94535
63	9	10.85	0.28636
64	9	3.80	0.92428
65	9	14.33	0.11101
66	9	3.57	0.93751
67	9	14.63	0.10159
68	9	6.96	0.64083
69	9	8.77	0.45870
70	9	7.19	0.61751
71	9	5.53	0.78563
72	9	1.45	0.99753
73	9	10.40	0.31925
74	9	7.03	0.63398
75	9	2.95	0.96637
76	9	12.54	0.18479

77	9	2.87	0.96917
78	9	6.10	0.72992
79	9	9.65	0.37991
80	9	6.77	0.66153
81	9	6.99	0.63860
82	9	5.22	0.81427
83	9	5.58	0.78097
84	9	12.46	0.18870
85	9	11.27	0.25788
86	9	5.77	0.76231
87	9	20.40	0.01560
88	9	5.69	0.77027
89	9	7.03	0.63410
90	9	1.71	0.99531
91	9	4.97	0.83719
92	9	7.84	0.55022
93	9	6.40	0.69926
94	9	2.17	0.98856
95	9	12.07	0.20950
96	9	8.44	0.49047
97	9	6.47	0.69243
98	9	10.17	0.33665
99	9	16.85	0.05113
100	9	12.56	0.18364
Combined P-value for all tests (Using KS method)			0.09474

Notes:

- 1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

## 1.2 Poker hand types statistics for 36 cards deck:

Test No.	DOF	ChiSqr	P-Value
1	9	8.93	0.44406
2	9	4.86	0.84597
3	9	3.63	0.93393
4	9	8.30	0.50454
5	9	8.98	0.43945
6	9	21.97	0.00896
7	9	12.16	0.20470
8	9	6.49	0.69041
9	9	3.93	0.91599
10	9	7.31	0.60473
11	9	13.07	0.15932
12	9	4.47	0.87780
13	9	4.68	0.86126
14	9	10.98	0.27676
15	9	10.32	0.32548
16	9	8.06	0.52769
17	9	17.61	0.03997
18	9	9.55	0.38775
19	9	19.49	0.02133
20	9	15.65	0.07450
21	9	15.73	0.07284

Combined P-value for all tests (Using KS method)	0.92463
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Notes:

- 1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

## 2. Poker rank statistics

The Poker rank analysis aims to establish that the rank of the cards in each position was equally distributed in one of the 13 possible ranks (2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K, A) for a 52 card deck and 9 ranks (6, 7, 8, 9, 10, J, Q, K, A) for a 36 card deck.

The Poker rank analysis involved creating subsets of data and conducting Chi-square tests on each subset. The analysis performs a KS Test (Kolmogorov-Smirnov test) for uniform distribution on the observed p-values, and the combined p-value result of this test is taken as the final result of the Ranks statistics tests.

### 2.1 Poker rank statistics for 52 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	84	107.42	0.04344
2	7	84	71.78	0.82649
3	7	84	100.46	0.10639
4	7	84	91.80	0.26260
5	7	84	65.05	0.93783
6	7	84	82.07	0.53926
7	7	84	76.15	0.71702
8	7	84	76.09	0.71855
9	7	84	84.62	0.46038
10	7	84	87.46	0.37651
11	7	84	85.57	0.43185
12	7	84	79.00	0.63393
13	7	84	69.10	0.87975
14	7	84	77.07	0.69079
15	7	84	96.67	0.16279
16	7	84	62.77	0.95979
17	7	84	103.98	0.06886
18	7	84	95.26	0.18837
19	7	84	95.12	0.19122
20	7	84	91.30	0.27466
21	7	84	74.00	0.77412
22	7	84	86.29	0.41048
23	7	84	87.89	0.36444
24	7	84	89.06	0.33206
25	7	84	80.65	0.58335
26	7	84	85.29	0.44033
27	7	84	88.22	0.35516
28	7	84	77.30	0.68418
29	7	84	100.56	0.10508
30	7	84	64.75	0.94106
31	7	84	112.85	0.01959
32	7	84	74.02	0.77362
33	7	84	100.26	0.10888
34	7	84	68.30	0.89326
35	7	84	80.51	0.58747
36	7	84	85.82	0.42447

37	7	84	77.31	0.68392
38	7	84	85.46	0.43514
39	7	84	80.82	0.57819
40	7	84	87.50	0.37540
41	7	84	103.79	0.07057
42	7	84	104.63	0.06326
43	7	84	80.57	0.58563
44	7	84	93.83	0.21728
45	7	84	84.04	0.47817
46	7	84	75.64	0.73100
47	7	84	89.76	0.31356
48	7	84	78.02	0.66302
49	7	84	74.39	0.76419
50	7	84	72.83	0.80274
51	7	84	87.15	0.38537
52	7	84	87.46	0.37663
53	7	84	84.74	0.45682
54	7	84	84.13	0.47547
55	7	84	65.62	0.93118
56	7	84	81.99	0.54174
57	7	84	82.29	0.53226
58	7	84	73.51	0.78630
59	7	84	90.28	0.30000
60	7	84	77.53	0.67744
61	7	84	78.48	0.64937
62	7	84	97.00	0.15710
63	7	84	103.47	0.07348
64	7	84	84.63	0.46026
65	7	84	73.80	0.77903
66	7	84	83.70	0.48876
67	7	84	79.51	0.61826
68	7	84	89.45	0.32167
69	7	84	85.83	0.42418
70	7	84	79.90	0.60625
71	7	84	84.75	0.45649
72	7	84	81.93	0.54371
73	7	84	74.58	0.75917
74	7	84	92.99	0.23546
75	7	84	79.30	0.62479
76	7	84	76.93	0.69485
77	7	84	66.39	0.92143
78	7	84	80.60	0.58485
79	7	84	104.77	0.06212
80	7	84	64.27	0.94615
81	7	84	72.31	0.81462
82	7	84	107.12	0.04526
83	7	84	105.34	0.05762
84	7	84	73.20	0.79395
85	7	84	76.35	0.71136
86	7	84	73.29	0.79159
87	7	84	80.35	0.59243
88	7	84	76.77	0.69934
89	7	84	75.02	0.74775
90	7	84	96.58	0.16438
91	7	84	71.62	0.83016

92	7	84	100.24	0.10919
93	7	84	111.60	0.02369
94	7	84	72.32	0.81442
95	7	84	135.02	0.00035
96	7	84	89.99	0.30769
97	7	84	77.54	0.67713
98	7	84	85.93	0.42107
99	7	84	73.07	0.79686
100	7	84	82.35	0.53042
Combined P-value for all tests (Using KS method)				0.52982

Notes:

- 1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

## 2.2 Poker rank statistics for 36 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	56	37.23	0.97488
2	7	56	47.27	0.79048
3	7	56	71.76	0.07635
4	7	56	63.40	0.23168
5	7	56	41.35	0.92836
6	7	56	45.98	0.82780
7	7	56	67.83	0.13355
8	7	56	72.26	0.07068
9	7	56	68.72	0.11830
10	7	56	57.83	0.40740
11	7	56	32.09	0.99575
12	7	56	58.67	0.37776
13	7	56	61.99	0.27117
14	7	56	74.99	0.04591
15	7	56	56.82	0.44424
16	7	56	54.59	0.52853
17	7	56	56.26	0.46512
18	7	56	45.01	0.85352
19	7	56	57.54	0.41804
20	7	56	61.91	0.27338
21	7	56	83.54	0.00994
22	7	56	53.48	0.57067
23	7	56	33.86	0.99159
24	7	56	42.92	0.90037
25	7	56	50.10	0.69675
26	7	56	62.73	0.25011
27	7	56	50.71	0.67476
28	7	56	49.14	0.72998
29	7	56	59.17	0.36053
30	7	56	62.89	0.24552
31	7	56	50.78	0.67227
32	7	56	66.73	0.15452
33	7	56	60.47	0.31759
34	7	56	56.34	0.46202
35	7	56	96.16	0.00068
36	7	56	61.17	0.29557
37	7	56	72.32	0.07013
38	7	56	46.34	0.81781

39	7	56	77.47	0.03027
40	7	56	50.08	0.69752
41	7	56	59.13	0.36188
42	7	56	55.39	0.49781
43	7	56	58.24	0.39291
44	7	56	62.49	0.25667
45	7	56	67.78	0.13449
46	7	56	43.74	0.88321
47	7	56	59.67	0.34380
48	7	56	28.75	0.99906
49	7	56	40.25	0.94422
50	7	56	45.46	0.84179
51	7	56	57.74	0.41089
52	7	56	39.29	0.95595
53	7	56	58.14	0.39661
54	7	56	45.45	0.84207
55	7	56	46.04	0.82628
56	7	56	53.80	0.55869
57	7	56	51.71	0.63801
58	7	56	63.65	0.22510
59	7	56	40.70	0.93811
60	7	56	67.62	0.13736
61	7	56	45.86	0.83111
62	7	56	48.85	0.73972
63	7	56	54.83	0.51918
64	7	56	53.66	0.56406
65	7	56	59.97	0.33380
66	7	56	51.48	0.64659
67	7	56	59.00	0.36644
68	7	56	52.75	0.59880
69	7	56	44.72	0.86065
70	7	56	95.93	0.00072
71	7	56	41.54	0.92523
72	7	56	54.65	0.52605
73	7	56	53.89	0.55497
74	7	56	55.98	0.47551
75	7	56	76.33	0.03676
76	7	56	53.90	0.55483
77	7	56	55.77	0.48365
78	7	56	49.59	0.71448
79	7	56	48.65	0.74669
80	7	56	46.18	0.82227
81	7	56	70.45	0.09266
82	7	56	47.81	0.77387
83	7	56	54.46	0.53321
84	7	56	45.80	0.83277
85	7	56	52.50	0.60809
86	7	56	41.84	0.92018
87	7	56	43.78	0.88234
88	7	56	57.51	0.41895
89	7	56	54.47	0.53279
90	7	56	60.32	0.32256
91	7	56	41.89	0.91938
92	7	56	53.96	0.55249
93	7	56	57.17	0.43127

94	7	56	43.90	0.87979
95	7	56	59.54	0.34825
96	7	56	54.23	0.54202
97	7	56	47.77	0.77500
98	7	56	54.93	0.51548
99	7	56	63.02	0.24188
100	7	56	46.55	0.81173
Combined P-value for all tests (Using KS method)				0.56700

Notes:

- 1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

### 3. Poker suits statistics

The Poker suits analysis aims to verify that that the cards dealt exhibit an equal probability of all 4 suits (Clubs, Diamonds, Hearts and Spades) in all positions.

The Poker suits analysis involved creating subsets of data and conducting Chi-square tests on each subset. The analysis performs a KS Test (Kolmogorov-Smirnov test) for uniform distribution on the observed p-values, and the combined p-value result of this test is taken as the final result of the Suits statistics tests.

#### 3.1 Poker suits statistics for 52 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	21	17.06	0.70775
2	7	21	22.23	0.38642
3	7	21	32.99	0.04628
4	7	21	33.96	0.03659
5	7	21	21.62	0.42177
6	7	21	26.32	0.19457
7	7	21	13.49	0.89044
8	7	21	13.75	0.88020
9	7	21	27.12	0.16682
10	7	21	18.84	0.59539
11	7	21	30.39	0.08439
12	7	21	23.83	0.30129
13	7	21	23.66	0.30999
14	7	21	18.17	0.63796
15	7	21	30.22	0.08775
16	7	21	19.17	0.57454
17	7	21	20.54	0.48716
18	7	21	30.66	0.07957
19	7	21	17.46	0.68273
20	7	21	7.18	0.99777
21	7	21	23.09	0.33929
22	7	21	10.60	0.97005
23	7	21	22.00	0.39957
24	7	21	20.56	0.48626
25	7	21	25.37	0.23159
26	7	21	18.59	0.61137
27	7	21	18.66	0.60677
28	7	21	18.46	0.61965
29	7	21	25.66	0.21987
30	7	21	23.87	0.29939
31	7	21	26.07	0.20397
32	7	21	26.59	0.18495



33	7	21	17.34	0.69007
34	7	21	25.90	0.21021
35	7	21	15.69	0.78708
36	7	21	25.95	0.20830
37	7	21	19.26	0.56832
38	7	21	13.66	0.88370
39	7	21	14.33	0.85512
40	7	21	19.94	0.52476
41	7	21	17.38	0.68772
42	7	21	20.28	0.50357
43	7	21	14.89	0.82849
44	7	21	16.66	0.73127
45	7	21	11.34	0.95580
46	7	21	29.42	0.10428
47	7	21	14.47	0.84856
48	7	21	13.96	0.87123
49	7	21	11.30	0.95660
50	7	21	10.66	0.96892
51	7	21	13.34	0.89630
52	7	21	16.59	0.73552
53	7	21	20.09	0.51577
54	7	21	16.41	0.74622
55	7	21	15.46	0.79917
56	7	21	23.74	0.30564
57	7	21	22.66	0.36263
58	7	21	28.77	0.11954
59	7	21	27.95	0.14159
60	7	21	17.25	0.69586
61	7	21	23.27	0.32980
62	7	21	26.39	0.19202
63	7	21	27.85	0.14459
64	7	21	26.30	0.19515
65	7	21	24.07	0.28957
66	7	21	11.53	0.95150
67	7	21	24.99	0.24781
68	7	21	20.92	0.46411
69	7	21	11.68	0.94775
70	7	21	14.41	0.85138
71	7	21	21.53	0.42720
72	7	21	25.45	0.22805
73	7	21	14.55	0.84505
74	7	21	13.26	0.89936
75	7	21	21.33	0.43917
76	7	21	19.72	0.53879
77	7	21	23.81	0.30241
78	7	21	13.89	0.87438
79	7	21	16.56	0.73738
80	7	21	33.34	0.04256
81	7	21	15.77	0.78222
82	7	21	16.83	0.72120
83	7	21	23.37	0.32447
84	7	21	32.42	0.05312
85	7	21	22.68	0.36148
86	7	21	11.05	0.96185
87	7	21	31.65	0.06352

88	7	21	19.22	0.57082
89	7	21	17.75	0.66505
90	7	21	20.80	0.47106
91	7	21	20.57	0.48545
92	7	21	19.51	0.55254
93	7	21	19.03	0.58336
94	7	21	25.33	0.23331
95	7	21	22.04	0.39694
96	7	21	23.44	0.32100
97	7	21	27.85	0.14449
98	7	21	11.48	0.95268
99	7	21	14.37	0.85300
100	7	21	21.50	0.42877
Combined P-value for all tests (Using KS method)				0.91485

Notes:

- 1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

### 3.2 Poker suits statistics for 36 cards deck:

Test No.	Positions	DOF	ChiSqr	P-Value
1	7	21	19.26	0.56847
2	7	21	30.30	0.08620
3	7	21	19.92	0.52646
4	7	21	12.26	0.93227
5	7	21	11.54	0.95131
6	7	21	8.85	0.99037
7	7	21	22.67	0.36204
8	7	21	24.94	0.24960
9	7	21	26.86	0.17567
10	7	21	22.66	0.36226
11	7	21	20.21	0.50772
12	7	21	10.43	0.97284
13	7	21	27.66	0.15013
14	7	21	27.85	0.14452
15	7	21	17.70	0.66765
16	7	21	15.72	0.78508
17	7	21	36.32	0.02012
18	7	21	21.17	0.44853
19	7	21	18.32	0.62847
20	7	21	20.06	0.51762
21	7	21	7.78	0.99601
22	7	21	30.30	0.08611
23	7	21	18.60	0.61068
24	7	21	20.87	0.46698
25	7	21	25.86	0.21199
26	7	21	21.95	0.40265
27	7	21	22.08	0.39482
28	7	21	24.86	0.25317
29	7	21	31.98	0.05883
30	7	21	19.22	0.57129
31	7	21	16.65	0.73221
32	7	21	21.26	0.44312
33	7	21	14.48	0.84796
34	7	21	23.32	0.32707

35	7	21	16.97	0.71295
36	7	21	22.82	0.35361
37	7	21	14.40	0.85174
38	7	21	6.00	0.99943
39	7	21	12.13	0.93601
40	7	21	21.18	0.44795
41	7	21	17.92	0.65396
42	7	21	19.78	0.53498
43	7	21	27.06	0.16901
44	7	21	26.68	0.18170
45	7	21	17.06	0.70751
46	7	21	16.76	0.72564
47	7	21	15.64	0.78978
48	7	21	22.92	0.34852
49	7	21	15.21	0.81245
50	7	21	18.24	0.63408
51	7	21	20.09	0.51569
52	7	21	24.26	0.28082
53	7	21	21.88	0.40636
54	7	21	19.11	0.57826
55	7	21	28.74	0.12036
56	7	21	19.36	0.56206
57	7	21	19.15	0.57570
58	7	21	18.50	0.61733
59	7	21	10.11	0.97751
60	7	21	12.58	0.92270
61	7	21	21.98	0.40062
62	7	21	35.09	0.02759
63	7	21	25.10	0.24269
64	7	21	14.20	0.86071
65	7	21	29.13	0.11092
66	7	21	13.96	0.87124
67	7	21	25.28	0.23511
68	7	21	13.77	0.87936
69	7	21	22.72	0.35917
70	7	21	18.74	0.60197
71	7	21	21.27	0.44254
72	7	21	25.91	0.21001
73	7	21	32.25	0.05521
74	7	21	17.61	0.67326
75	7	21	27.91	0.14276
76	7	21	20.50	0.49007
77	7	21	23.73	0.30610
78	7	21	17.75	0.66454
79	7	21	18.58	0.61232
80	7	21	30.36	0.08499
81	7	21	9.06	0.98877
82	7	21	16.60	0.73486
83	7	21	29.78	0.09648
84	7	21	22.38	0.37795
85	7	21	18.07	0.64485
86	7	21	13.69	0.88269
87	7	21	19.26	0.56872
88	7	21	34.77	0.02993
89	7	21	23.18	0.33425

90	7	21	12.96	0.90996
91	7	21	16.28	0.75372
92	7	21	23.83	0.30143
93	7	21	11.74	0.94627
94	7	21	21.55	0.42609
95	7	21	24.03	0.29159
96	7	21	22.62	0.36479
97	7	21	13.01	0.90823
98	7	21	15.62	0.79039
99	7	21	19.46	0.55591
100	7	21	23.57	0.31447
Combined P-value for all tests (Using KS method)				0.94760

Notes:

- 1) The P-values are observed probabilities from the Chi-Square tests. The last row shows the result of the KS Test performed on the p-values for all Chi-Square tests, where there are sufficient data.

## 4. Summary of the analysis

### 4.1 Summary of the analysis of 52 cards deck:

The analysis of 52 cards completes by combining the result of the KS Test performed in the 3 types of analysis (Hand Types, Ranks and Suits) for 52 card decks using the Holm's method and producing a single Combined P -value.

The combined p-value produced using the Holm's method is used as indication for statistical randomness.

Combination of p-values using Holm's Method		
Test	P-Value	P-Adjusted
Ranks Test	0.52982	1.00000
Suits Test	0.91485	1.00000
Hand Types Test	0.09474	0.28423
<b>Combined P-Value using Holm's Method</b>		0.28423

Notes:

- 1) The combined p-value of all statistical tests using Holm's Method conducted for 52 card decks is greater than the minimum value of 0.05 which indicates that the randomness of the observed data falls within 95% confidence limits.

The final outcome of the analysis of 52 cards deck indicates that the RNG is working correctly.

### 4.2 Summary of the analysis of 36 cards deck:

The analysis of 36 cards completes by combining the result of the KS Test performed in the 3 types of analysis (Hand Types, Ranks and Suits) for 36 card decks using the Holm's method and producing a single Combined P -value. Where there are insufficient data the individual Chi-Square tests results are used in the Holm's method for producing a combined p-value.

The combined p-value produced from the using the Holm's method is used as indication for statistical randomness.

Combination of p-values using Holm's Method		
Test	P-Value	P-Adjusted
Ranks Test	0.56700	1.00000
Suits Test	0.94760	1.00000
Hands Type Test	0.92463	1.00000

<b>Combined P-Value using Holm's Method</b>	1.00000
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Notes:

- 1) The combined p-value of all statistical tests using Holm's Method conducted for 36 card decks is greater than the minimum value of 0.05 which indicates that the randomness of the observed data falls within 95% confidence limits.

The final outcome of the analysis of 36 cards deck indicates that the RNG is working correctly.

## 5. Conclusion

Analysis of actual data from game logs for 'Hand Types', 'Ranks' and 'Suits' for **52-card decks** and **36-card decks** indicated statistical randomness.

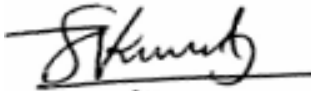
iTech Labs has done limited sanity checks to verify the integrity of the game logs. iTech Labs also maintains a copy of the game logs for verification purposes. There were a large enough number of game records to give the calculations sufficient statistical power.

We conclude that the Random Number Generator (RNG) is working correctly.

Please click here to see the [Original](#) report.

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**Signed:**



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**Kiren Sreekumar**  
**Principal Consultant**  
**iTech Labs Australia**  
Date: 16 March, 2020

**Signed:**



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**Geoff Nicoll**  
**Principal Consultant**  
**iTech Labs Australia**  
Date: 16 March, 2020

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Disclaimer.

While it is not possible to test all possible scenarios in a laboratory environment, iTech Labs has conducted a level of testing appropriate for a component test of this type.