

## Poker Cards Analysis - February 2020

### The Directors

GVC Plc

This is to confirm that iTech Labs has examined the game logs for Poker games for the period **February 01, 2020** to **February 29, 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.partypoker.cz/>, <https://da.partypoker.com/>, <https://danskspil.dk/>, <https://www.partypoker.fr/>, <https://www.giocodigitale.it/>, <https://www.br.betboo.com/en/>, <https://www.partypremium.com/>, <https://www.partypoker.es/en/>, <https://www.partypoker.com/>, <https://sports.premium.com/en/sports/>, <https://poker.partypoker.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	13.30	0.14955
2	9	12.40	0.19182
3	9	5.24	0.81254
4	9	3.39	0.94686
5	9	10.22	0.33261
6	9	16.22	0.06234
7	9	9.77	0.36962
8	9	8.59	0.47578
9	9	9.49	0.39339
10	9	8.79	0.45728
11	9	6.60	0.67876
12	9	10.95	0.27939
13	9	15.86	0.06976
14	9	8.84	0.45202
15	9	7.36	0.59926
16	9	12.52	0.18576
17	9	15.86	0.06993
18	9	5.37	0.80048
19	9	7.15	0.62148
20	9	12.86	0.16908
21	9	8.02	0.53227

22	9	4.89	0.84380
23	9	9.87	0.36107
24	9	8.80	0.45577
25	9	7.56	0.57901
26	9	14.87	0.09456
27	9	4.59	0.86822
28	9	14.57	0.10359
29	9	14.50	0.10566
30	9	9.94	0.35566
31	9	3.74	0.92738
32	9	9.18	0.42063
33	9	5.26	0.81127
34	9	4.37	0.88547
35	9	9.05	0.43276
36	9	5.93	0.74713
37	9	9.35	0.40558
38	9	6.59	0.67987
39	9	5.52	0.78713
40	9	9.16	0.42220
41	9	9.90	0.35865
42	9	3.83	0.92245
43	9	10.01	0.34938
44	9	3.64	0.93370
45	9	7.43	0.59288
46	9	10.89	0.28300
47	9	5.04	0.83052
48	9	6.10	0.72974
49	9	14.00	0.12237
50	9	15.22	0.08495
51	9	9.64	0.38020
52	9	8.94	0.44241
53	9	17.73	0.03846
54	9	12.70	0.17688
55	9	7.92	0.54206
56	9	16.02	0.06650
57	9	2.14	0.98898
58	9	8.20	0.51371
59	9	5.76	0.76352
60	9	9.68	0.37723
61	9	5.15	0.82146
62	9	4.15	0.90094
63	9	4.91	0.84236
64	9	16.87	0.05080
65	9	7.84	0.55001
66	9	3.96	0.91386
67	9	0.67	0.99989
68	9	11.71	0.23022
69	9	5.75	0.76436
70	9	4.37	0.88575
71	9	5.33	0.80507
72	9	12.69	0.17734
73	9	4.71	0.85894
74	9	4.38	0.88462
75	9	7.63	0.57231
76	9	7.97	0.53738

77	9	7.42	0.59344
78	9	16.20	0.06281
79	9	4.71	0.85921
80	9	4.74	0.85595
81	9	5.70	0.76930
82	9	6.46	0.69301
83	9	9.24	0.41568
84	9	8.55	0.47937
85	9	8.31	0.50282
86	9	9.92	0.35672
87	9	10.27	0.32903
88	9	9.69	0.37574
89	9	8.04	0.53036
90	9	9.09	0.42877
91	9	9.48	0.39422
92	9	11.09	0.26972
93	9	15.13	0.08753
94	9	8.42	0.49261
95	9	7.78	0.55652
96	9	17.18	0.04602
97	9	11.93	0.21737
98	9	6.58	0.68076
99	9	7.75	0.55976
100	9	16.32	0.06042
Combined P-value for all tests (Using KS method)			0.70644

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	4.21	0.89706
2	9	7.37	0.59828
3	9	11.26	0.25849
4	9	12.26	0.19889
5	9	8.96	0.44062
6	9	7.23	0.61350
7	9	7.12	0.62486
8	9	5.89	0.75119
9	9	12.54	0.18431
10	9	15.31	0.08274
11	9	6.26	0.71344
12	9	5.74	0.76573
13	9	13.13	0.15698
14	9	11.05	0.27261
15	9	9.15	0.42327
16	9	6.31	0.70900
17	9	5.06	0.82883
18	9	6.11	0.72872
Combined P-value for all tests (Using KS method)			0.75213

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	71.18	0.83954
2	7	84	72.27	0.81564
3	7	84	111.54	0.02392
4	7	84	75.52	0.73436
5	7	84	86.70	0.39854
6	7	84	66.61	0.91848
7	7	84	69.94	0.86423
8	7	84	91.71	0.26468
9	7	84	89.88	0.31036
10	7	84	84.08	0.47689
11	7	84	98.22	0.13756
12	7	84	123.40	0.00333
13	7	84	80.03	0.60255
14	7	84	85.88	0.42251
15	7	84	73.05	0.79749
16	7	84	72.13	0.81869
17	7	84	109.38	0.03290
18	7	84	55.46	0.99312
19	7	84	64.73	0.94136
20	7	84	84.84	0.45371
21	7	84	75.04	0.74712
22	7	84	81.70	0.55082
23	7	84	87.76	0.36802
24	7	84	61.14	0.97146
25	7	84	74.87	0.75156
26	7	84	71.67	0.82892
27	7	84	81.88	0.54499
28	7	84	72.66	0.80656
29	7	84	109.92	0.03042
30	7	84	49.45	0.99904
31	7	84	75.17	0.74380
32	7	84	86.73	0.39757
33	7	84	81.03	0.57145
34	7	84	109.86	0.03065
35	7	84	73.13	0.79558
36	7	84	86.68	0.39903
37	7	84	91.22	0.27673
38	7	84	105.65	0.05528
39	7	84	73.92	0.77601

40	7	84	73.30	0.79143
41	7	84	73.84	0.77813
42	7	84	82.73	0.51881
43	7	84	67.21	0.91005
44	7	84	81.27	0.56411
45	7	84	96.60	0.16397
46	7	84	82.79	0.51686
47	7	84	85.76	0.42615
48	7	84	65.17	0.93645
49	7	84	87.46	0.37640
50	7	84	80.84	0.57734
51	7	84	99.10	0.12462
52	7	84	82.42	0.52833
53	7	84	66.66	0.91784
54	7	84	99.60	0.11763
55	7	84	90.70	0.28953
56	7	84	100.68	0.10365
57	7	84	59.18	0.98177
58	7	84	81.91	0.54415
59	7	84	96.65	0.16311
60	7	84	80.67	0.58280
61	7	84	84.03	0.47855
62	7	84	69.26	0.87680
63	7	84	69.26	0.87681
64	7	84	92.64	0.24319
65	7	84	56.82	0.98998
66	7	84	72.35	0.81388
67	7	84	72.98	0.79906
68	7	84	94.06	0.21232
69	7	84	86.66	0.39968
70	7	84	75.29	0.74053
71	7	84	82.35	0.53039
72	7	84	104.68	0.06291
73	7	84	67.85	0.90042
74	7	84	69.93	0.86449
75	7	84	80.75	0.58032
76	7	84	78.23	0.65686
77	7	84	80.15	0.59871
78	7	84	85.71	0.42748
79	7	84	88.50	0.34728
80	7	84	66.06	0.92572
81	7	84	80.00	0.60322
82	7	84	86.71	0.39801
83	7	84	111.20	0.02514
84	7	84	73.86	0.77774
85	7	84	82.67	0.52056
86	7	84	80.76	0.57999
87	7	84	81.31	0.56271
88	7	84	101.45	0.09448
89	7	84	107.93	0.04042
90	7	84	86.50	0.40413
91	7	84	83.73	0.48774
92	7	84	127.18	0.00166
93	7	84	91.59	0.26766
94	7	84	101.63	0.09249

95	7	84	98.26	0.13690
96	7	84	70.43	0.85479
97	7	84	85.67	0.42876
98	7	84	66.03	0.92609
99	7	84	78.10	0.66082
100	7	84	75.57	0.73294
Combined P-value for all tests (Using KS method)				0.18579

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	74.48	0.04988
2	7	56	57.18	0.43121
3	7	56	58.27	0.39171
4	7	56	48.37	0.75580
5	7	56	60.13	0.32854
6	7	56	60.19	0.32679
7	7	56	64.69	0.19920
8	7	56	48.04	0.76657
9	7	56	66.57	0.15770
10	7	56	63.07	0.24073
11	7	56	56.25	0.46553
12	7	56	57.40	0.42317
13	7	56	69.29	0.10925
14	7	56	52.92	0.59207
15	7	56	48.99	0.73515
16	7	56	57.04	0.43616
17	7	56	69.39	0.10774
18	7	56	53.95	0.55305
19	7	56	56.30	0.46368
20	7	56	51.16	0.65811
21	7	56	39.37	0.95515
22	7	56	50.44	0.68466
23	7	56	105.91	0.00006
24	7	56	58.10	0.39793
25	7	56	48.27	0.75917
26	7	56	50.65	0.67686
27	7	56	43.73	0.88339
28	7	56	75.23	0.04413
29	7	56	66.27	0.16381
30	7	56	58.92	0.36926
31	7	56	57.28	0.42759
32	7	56	47.99	0.76801
33	7	56	50.56	0.68011
34	7	56	45.11	0.85099
35	7	56	53.19	0.58178
36	7	56	63.45	0.23048
37	7	56	69.19	0.11092
38	7	56	52.26	0.61731
39	7	56	44.44	0.86731
40	7	56	71.23	0.08266
41	7	56	61.60	0.28279

42	7	56	54.23	0.54220
43	7	56	70.16	0.09661
44	7	56	57.36	0.42464
45	7	56	78.39	0.02580
46	7	56	50.70	0.67522
47	7	56	67.10	0.14719
48	7	56	51.31	0.65263
49	7	56	62.36	0.26054
50	7	56	45.58	0.83885
51	7	56	71.72	0.07681
52	7	56	61.49	0.28604
53	7	56	79.25	0.02215
54	7	56	55.89	0.47887
55	7	56	44.11	0.87495
56	7	56	62.56	0.25480
57	7	56	48.32	0.75741
58	7	56	35.16	0.98680
59	7	56	45.33	0.84522
60	7	56	50.74	0.67375
61	7	56	57.81	0.40837
62	7	56	45.47	0.84158
63	7	56	58.96	0.36771
64	7	56	55.47	0.49502
65	7	56	60.80	0.30710
66	7	56	60.43	0.31895
67	7	56	43.88	0.88022
68	7	56	61.88	0.27437
69	7	56	60.30	0.32300
70	7	56	54.06	0.54857
71	7	56	55.15	0.50698
72	7	56	45.48	0.84135
73	7	56	49.09	0.73179
74	7	56	61.86	0.27490
75	7	56	50.66	0.67637
76	7	56	64.17	0.21198
77	7	56	42.45	0.90932
78	7	56	66.00	0.16951
79	7	56	46.96	0.79996
80	7	56	58.74	0.37533
81	7	56	59.73	0.34186
82	7	56	38.58	0.96343
83	7	56	54.13	0.54588
84	7	56	69.16	0.11135
85	7	56	46.07	0.82538
86	7	56	49.89	0.70414
87	7	56	61.89	0.27391
88	7	56	55.62	0.48936
89	7	56	61.53	0.28462
90	7	56	43.61	0.88602
91	7	56	52.75	0.59866
92	7	56	66.46	0.15999
93	7	56	48.25	0.75981
94	7	56	62.63	0.25282
95	7	56	52.61	0.60386
96	7	56	64.69	0.19911

97	7	56	59.00	0.36644
98	7	56	49.34	0.72308
99	7	56	60.50	0.31678
100	7	56	48.90	0.73833
Combined P-value for all tests (Using KS method)				0.79487

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	19.60	0.54674
2	7	21	24.91	0.25101
3	7	21	27.46	0.15625
4	7	21	17.63	0.67236
5	7	21	16.95	0.71435
6	7	21	15.65	0.78919
7	7	21	17.40	0.68647
8	7	21	20.57	0.48569
9	7	21	19.60	0.54678
10	7	21	28.09	0.13772
11	7	21	14.89	0.82845
12	7	21	26.03	0.20542
13	7	21	15.82	0.77954
14	7	21	14.72	0.83693
15	7	21	17.19	0.69958
16	7	21	14.62	0.84160
17	7	21	15.35	0.80489
18	7	21	28.04	0.13907
19	7	21	36.47	0.01934
20	7	21	23.01	0.34345
21	7	21	31.26	0.06937
22	7	21	18.21	0.63600
23	7	21	13.06	0.90666
24	7	21	32.54	0.05155
25	7	21	36.38	0.01982
26	7	21	7.11	0.99791
27	7	21	32.46	0.05260
28	7	21	27.89	0.14340
29	7	21	20.66	0.47974
30	7	21	20.44	0.49382
31	7	21	18.12	0.64108
32	7	21	20.40	0.49630
33	7	21	19.27	0.56795
34	7	21	21.59	0.42317
35	7	21	20.21	0.50813



36	7	21	10.16	0.97671
37	7	21	23.05	0.34120
38	7	21	30.12	0.08957
39	7	21	20.75	0.47455
40	7	21	12.13	0.93595
41	7	21	28.04	0.13891
42	7	21	12.65	0.92028
43	7	21	23.62	0.31179
44	7	21	16.79	0.72360
45	7	21	15.78	0.78172
46	7	21	15.54	0.79477
47	7	21	32.16	0.05639
48	7	21	16.19	0.75871
49	7	21	13.93	0.87246
50	7	21	24.76	0.25789
51	7	21	14.47	0.84858
52	7	21	21.28	0.44170
53	7	21	12.37	0.92906
54	7	21	27.34	0.15996
55	7	21	15.02	0.82206
56	7	21	15.26	0.80954
57	7	21	28.59	0.12430
58	7	21	16.49	0.74127
59	7	21	23.25	0.33062
60	7	21	22.35	0.37982
61	7	21	21.48	0.43016
62	7	21	23.88	0.29903
63	7	21	15.66	0.78851
64	7	21	22.56	0.36786
65	7	21	10.95	0.96376
66	7	21	12.73	0.91770
67	7	21	18.50	0.61704
68	7	21	19.73	0.53846
69	7	21	19.01	0.58442
70	7	21	23.62	0.31166
71	7	21	14.85	0.83023
72	7	21	13.22	0.90066
73	7	21	12.94	0.91055
74	7	21	21.03	0.45725
75	7	21	16.30	0.75265
76	7	21	23.15	0.33578
77	7	21	10.88	0.96510
78	7	21	22.75	0.35749
79	7	21	15.82	0.77974
80	7	21	20.04	0.51842
81	7	21	9.07	0.98864
82	7	21	21.52	0.42769
83	7	21	14.49	0.84786
84	7	21	23.65	0.31031
85	7	21	20.11	0.51457
86	7	21	18.79	0.59854
87	7	21	22.24	0.38552
88	7	21	25.72	0.21745
89	7	21	30.97	0.07414
90	7	21	16.92	0.71608

91	7	21	28.37	0.12993
92	7	21	24.71	0.26016
93	7	21	20.52	0.48850
94	7	21	34.92	0.02882
95	7	21	19.34	0.56309
96	7	21	15.20	0.81258
97	7	21	25.68	0.21882
98	7	21	14.16	0.86263
99	7	21	23.23	0.33187
100	7	21	30.13	0.08932
Combined P-value for all tests (Using KS method)				0.53476

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	19.66	0.54275
2	7	21	30.19	0.08824
3	7	21	20.10	0.51481
4	7	21	25.60	0.22211
5	7	21	21.02	0.45772
6	7	21	20.37	0.49795
7	7	21	21.52	0.42761
8	7	21	11.04	0.96200
9	7	21	15.63	0.78996
10	7	21	20.52	0.48882
11	7	21	14.56	0.84446
12	7	21	12.99	0.90890
13	7	21	17.84	0.65936
14	7	21	17.52	0.67902
15	7	21	20.34	0.49970
16	7	21	14.84	0.83109
17	7	21	20.12	0.51392
18	7	21	13.94	0.87208
19	7	21	10.23	0.97577
20	7	21	18.26	0.63250
21	7	21	14.32	0.85537
22	7	21	16.22	0.75717
23	7	21	16.79	0.72375
24	7	21	14.49	0.84765
25	7	21	20.84	0.46863
26	7	21	22.20	0.38818
27	7	21	17.53	0.67827
28	7	21	29.20	0.10919
29	7	21	23.35	0.32571
30	7	21	17.64	0.67191
31	7	21	19.01	0.58463
32	7	21	23.61	0.31224
33	7	21	16.90	0.71727
34	7	21	10.61	0.96982
35	7	21	23.25	0.33080
36	7	21	40.04	0.00736
37	7	21	16.12	0.76276

38	7	21	21.34	0.43860
39	7	21	18.56	0.61334
40	7	21	25.86	0.21184
41	7	21	16.88	0.71847
42	7	21	17.87	0.65722
43	7	21	9.02	0.98909
44	7	21	16.89	0.71763
45	7	21	17.53	0.67865
46	7	21	24.11	0.28766
47	7	21	23.46	0.32005
48	7	21	38.89	0.01012
49	7	21	19.30	0.56577
50	7	21	31.09	0.07211
51	7	21	18.11	0.64229
52	7	21	26.65	0.18267
53	7	21	9.96	0.97948
54	7	21	23.05	0.34142
55	7	21	22.64	0.36325
56	7	21	17.44	0.68399
57	7	21	17.73	0.66590
58	7	21	8.51	0.99255
59	7	21	18.63	0.60873
60	7	21	20.09	0.51531
61	7	21	18.50	0.61705
62	7	21	31.47	0.06615
63	7	21	11.48	0.95256
64	7	21	21.11	0.45224
65	7	21	16.03	0.76774
66	7	21	28.06	0.13857
67	7	21	17.33	0.69080
68	7	21	24.23	0.28205
69	7	21	17.61	0.67366
70	7	21	37.36	0.01529
71	7	21	17.86	0.65797
72	7	21	12.76	0.91693
73	7	21	25.02	0.24621
74	7	21	14.77	0.83422
75	7	21	27.81	0.14551
76	7	21	24.34	0.27697
77	7	21	14.87	0.82952
78	7	21	28.37	0.12991
79	7	21	23.46	0.32016
80	7	21	18.78	0.59938
81	7	21	23.37	0.32447
82	7	21	21.89	0.40610
83	7	21	26.16	0.20029
84	7	21	26.40	0.19155
85	7	21	21.87	0.40692
86	7	21	18.16	0.63855
87	7	21	15.91	0.77475
88	7	21	20.70	0.47734
89	7	21	17.82	0.66042
90	7	21	22.02	0.39850
91	7	21	11.31	0.95650
92	7	21	15.63	0.79013

93	7	21	9.17	0.98780
94	7	21	22.40	0.37687
95	7	21	24.70	0.26021
96	7	21	19.24	0.56944
97	7	21	18.21	0.63581
98	7	21	15.46	0.79931
99	7	21	20.80	0.47112
100	7	21	16.45	0.74371
Combined P-value for all tests (Using KS method)				0.15061

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	0.18579	0.55737
Suits Test	0.53476	1.00000
Hand Types Test	0.70644	1.00000
<b>Combined P-Value using Holm's Method</b>		0.55737

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	0.79487	1.00000
Suits Test	0.15061	0.45182
Hands Type Test	0.75213	1.00000
<b>Combined P-Value using Holm's Method</b>		0.45182

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.

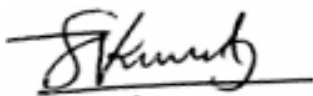
iTech Labs has done limited sanity checks to verify the integrity of the game logs. iTech Labs also maintains a copy of the game logs for verification purposes. There were a large enough number of game records to give the calculations sufficient statistical power.

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: 30 March, 2020

**Signed:**



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**Geoff Nicoll**  
**Principal Consultant**  
**iTech Labs Australia**  
Date: 30 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.

