Poker Cards Analysis – July 2025

The Directors
Entain Plc

This is to confirm that iTech Labs has examined the game logs for Poker games for the period **July 01, 2025,** to **July 31, 2025,** as recorded by the respective game servers and analyzed the Poker cards for statistical randomness. The results of the analysis are given below.

For details on the gaming sites serviced by the Entain Plc game servers and used in this audit refer to the List.

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	6.84	0.65421
2	9	11.62	0.23545
3	9	9.76	0.37046
4	9	3.21	0.95531
5	9	5.50	0.78877
6	9	3.61	0.93506
7	9	9.49	0.39301
8	9	5.47	0.79119
9	9	13.04	0.16095
10	9	7.58	0.57742
11	9	5.59	0.77983
12	9	9.72	0.37396
13	9	6.42	0.69739
14	9	7.31	0.60531
15	9	8.74	0.46164
16	9	6.80	0.65805
17	9	17.99	0.03533
18	9	4.79	0.85259
19	9	8.23	0.51109
20	9	8.85	0.45086
21	9	9.34	0.40665
22	9	10.62	0.30243
23	9	6.21	0.71859
24	9	15.65	0.07454
25	9	16.74	0.05287
26	9	13.55	0.13933
27	9	7.84	0.55028
28	9	11.43	0.24761

29	9	6.94	0.64375
30	9	18.31	0.03174
31	9	3.03	0.96296
32	9	6.65	0.67374
33	9	6.06	0.73349
34	9	7.23	0.61331
35	9	6.70	0.66872
36	9	7.07	0.62945
37	9	7.61	0.57422
38	9	14.37	0.10979
39	9	11.53	0.24089
40	9	11.87	0.22066
41	9	13.21	0.15312
42	9	14.53	0.10467
43	9	5.18	0.81827
44	9	13.44	0.14364
45	9	8.58	0.47648
46	9	5.54	0.78470
47	9	2.62	0.97759
48	9	11.91	0.21857
49	9	13.08	0.15922
50	9	9.66	0.37864
51	9	7.64	0.57082
52	9	12.91	0.16680
53	9	11.21	0.26134
54	9	18.72	0.02769
55	9	6.20	0.72023
56	9	10.28	0.32860
57	9	6.67	0.67156
58	9	11.76	0.22709
59	9	4.35	0.88711
60	9	12.53	0.18511
61	9	4.09	0.90553
62	9	15.64	0.07488
63	9	8.49	0.48519
64	9	9.39	0.40233
65	9	4.17	0.90002
66	9	15.49	0.07823
67	9	8.63	0.47252
68	9	9.38	0.40257
69	9	12.56	0.18375
70	9	5.95	0.74519
71	9	4.38	0.88502
72	9	8.63	0.47244
73	9	2.65	0.97652
74	9	3.82	0.92288
75	9	12.15	0.20510
76	9	4.10	0.90480
77	9	10.80	0.28938
78	9	7.98	0.53596
79	9	5.43	0.79547
80	9	9.51	0.39199
81	9	8.02	0.53169
82	9	8.03	0.53103
83	9	6.42	0.69690
84	9	9.18	0.42088
85	9	10.69	0.29762

86	9	12.81	0.17125
87	9	12.26	0.19921
88	9	5.40	0.79786
89	9	4.58	0.86890
90	9	8.53	0.48161
91	9	7.15	0.62099
92	9	14.88	0.09417
93	9	9.29	0.41124
94	9	2.80	0.97183
95	9	5.96	0.74397
96	9	5.98	0.74188
97	9	5.85	0.75524
98	9	19.59	0.02060
99	9	3.41	0.94593
100	9	5.55	0.78440
Combined P-value for all tests (Using KS method)			0.99604

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.

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.	DOF	ChiSqr	P-Value
1	84	75.10	0.74567
2	84	85.41	0.43664
3	84	87.79	0.36717
4	84	91.00	0.28191
5	84	84.20	0.47329
6	84	85.92	0.42150
7	84	91.78	0.26317
8	84	109.57	0.03199
9	84	82.91	0.51309
10	84	68.96	0.88203
11	84	76.12	0.71784
12	84	105.92	0.05330
13	84	76.86	0.69693
14	84	66.72	0.91702
15	84	85.50	0.43386
16	84	74.62	0.75821
17	84	82.71	0.51938
18	84	100.63	0.10426
19	84	87.01	0.38946
20	84	74.89	0.75107
21	84	81.33	0.56237
22	84	77.86	0.66796
23	84	79.60	0.61548
24	84	74.17	0.76992
25	84	98.16	0.13849
26	84	80.71	0.58158
27	84	73.40	0.78908

28	84	75.78	0.72723
29	84	78.17	0.65869
30	84	77.96	0.66477
31	84	83.44	0.49684
32	84	98.52	0.13304
33	84	67.89	0.89971
34	84	77.76	0.67075
35	84	108.95	0.03501
36	84	67.83	0.90073
37	84	85.69	0.42817
38	84	56.03	0.99192
39	84	94.14	0.21076
40	84	82.64	0.52137
41	84	73.74	0.78051
42	84	110.41	0.02830
43	84	64.39	0.94487
44	84	79.07	0.63178
45	84	88.13	0.35764
46	84	85.99	0.41930
47	84	91.65	0.26630
48	84	104.17	0.06719
49	84	80.77	0.57951
50	84	96.61	0.16381
51	84	71.30	0.83689
52	84	80.66	0.58295
53	84	91.24	0.27619
54	84	85.47	0.43472
55	84	74.84	0.75253
56	84	112.74	0.01991
57	84	102.80	0.08002
58	84	82.71	0.51928
59	84	60.33	0.97614
60	84	88.35	0.35139
61	84	101.58	0.09300
62	84	100.85	0.10161
63	84	70.20	0.85929
64	84	60.69	0.97413
65	84	60.56	0.97488
66	84	63.29	0.95540
67	84	85.42	0.43621
68	84	75.81	0.72624
69	84	77.11	0.68974
70	84	87.23	0.38308
71	84	78.60	0.64597
72	84	75.68	0.72992
73	84	88.21	0.35537
74	84	58.03	0.98627
75	84	69.37	0.87478
76	84	72.41	0.81241
77	84	86.33	0.40939
78	84	87.16	0.38519
79	84	59.87	0.97855
80	84	76.07	0.71926
81	84	82.83	0.51575
82	84	71.48	0.83313
83	84	93.83	0.21727
84	84	93.18	0.23121

85	84	80.22	0.59662
86	84	82.70	0.51975
87	84	68.07	0.89698
88	84	80.11	0.59981
89	84	60.03	0.97772
90	84	78.98	0.63443
91	84	96.70	0.16220
92	84	89.11	0.33074
93	84	85.43	0.43601
94	84	90.98	0.28251
95	84	52.87	0.99686
96	84	89.47	0.32116
97	84	90.78	0.28738
98	84	85.60	0.43104
99	84	84.47	0.46502
100	84	73.86	0.77771
Combined P-value for all tests (Using KS method)			0.24196

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	15.82	0.77955
2	7	21	24.85	0.25352
3	7	21	20.92	0.46414
4	7	21	27.08	0.16816
5	7	21	10.16	0.97681
6	7	21	27.68	0.14936
7	7	21	15.70	0.78632
8	7	21	22.16	0.39040
9	7	21	20.26	0.50479
10	7	21	15.59	0.79225
11	7	21	15.69	0.78679
12	7	21	32.03	0.05816
13	7	21	9.92	0.97988
14	7	21	28.17	0.13536
15	7	21	29.46	0.10345
16	7	21	24.77	0.25748
17	7	21	27.32	0.16064
18	7	21	21.90	0.40547
19	7	21	25.83	0.21303
20	7	21	16.93	0.71512
21	7	21	21.56	0.42526
22	7	21	17.67	0.67006
23	7	21	20.77	0.47305
24	7	21	16.86	0.71983
25	7	21	14.45	0.84935
26	7	21	27.02	0.17018

27	7	21	24.74	0.25873
28	7	21	18.75	0.60094
29	7	21	18.07	0.64442
30	7	21	31.52	0.06548
31	7	21	12.65	0.92033
32	7	21	22.05	0.39642
33	7	21	21.70	0.41675
34	7	21	17.94	0.65306
35	7	21	12.04	0.93854
36	7	21	26.96	0.17203
37	7	21	16.95	0.71422
38	7	21	24.40	0.27402
39	7	21	18.85	0.59486
40	7	21	25.11	0.24241
41	7	21	16.29	0.75295
42	7	21	15.11	0.81762
43	7	21	25.58	0.22289
44	7	21	10.22	0.97585
45	7	21	23.83	0.30137
46	7	21	23.36	0.32492
47	7	21	28.05	0.13881
48	7	21	27.34	0.15977
49	7	21	18.75	0.60119
50	7	21	20.60	0.48349
51	7	21	26.61	0.18431
52	7	21	26.35	0.19350
53	7	21	8.61	0.99198
54	7	21	22.19	0.38888
55	7	21	21.72	0.41605
56	7	21	17.02	0.71003
57	7	21	33.37	0.04224
58	7	21	17.82	0.66031
59	7	21	21.02	0.45798
60	7	21	15.82	0.77982
61	7	21	16.36	0.74901
62	7	21	23.97	0.29448
63	7	21	17.17	0.70093
64	7	21	17.53	0.67839
65	7	21	35.47	0.02504
66	7	21	14.20	0.86082
67	7	21	22.29	0.38309
68	7	21	23.28	0.32938
69	7	21	43.45	0.00275
70	7	21	29.65	0.09931
71	7	21	16.16	0.76071
72	7	21	14.53	0.84556
73	7	21	21.58	0.42427
74	7	21	17.41	0.68578
75	7	21	12.06	0.93788
76	7	21	17.84	0.65925
77	7	21	28.32	0.13130
78	7	21	22.25	0.38528
79	7	21	26.09	0.20287
80	7	21	24.59	0.26516
81	7	21	19.68	0.54136
82	7	21	13.34	0.89640
83	7	21	32.02	0.05823

84	7	21	17.73	0.66593
85	7	21	19.59	0.54733
86	7	21	13.26	0.89911
87	7	21	22.29	0.38302
88	7	21	23.20	0.33359
89	7	21	20.01	0.52044
90	7	21	10.77	0.96700
91	7	21	18.58	0.61211
92	7	21	29.89	0.09420
93	7	21	21.38	0.43621
94	7	21	16.67	0.73111
95	7	21	17.06	0.70744
96	7	21	25.49	0.22660
97	7	21	18.69	0.60513
98	7	21	18.45	0.62029
99	7	21	18.83	0.59622
100	7	21	29.88	0.09441
Combined P-value for all tests (Using KS method)				0.88343

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	0.24196	0.72589
Suits Test	0.88343	1.00000
Hand Types Test	0.99604	1.00000
Combined P-Value using Holm's Method		0.72589

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. Conclusion

Analysis of actual data from game logs for 'Hand Types, 'Ranks' and 'Suits' for **52-card decks** indicated statistical randomness. Since there is no data in the case of 36 card deck, this report does not contain the details of 36 card deck.

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.

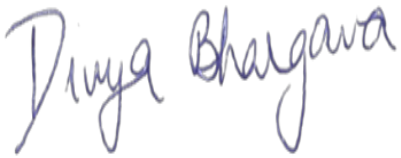
We conclude that the Random Number Generator (RNG) is working correctly.

Please click here to see the Original report.

Signed:

Alvin Rizaldi
Chief Executive Officer
iTech Labs
Date: 29 September 2025

Signed:



Divya Bhargava
Project Manager
iTech Labs
Date: 29 September 2025

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.