

Blackjack Cards Analysis – February 2026

The Directors

Entain Plc

This confirms that iTech Labs has examined the game logs for blackjack games from **February 1, 2026 to February 28, 2026**, as recorded by the respective game servers. The game logs were for blackjack games using 8 decks. iTech Labs analysed the blackjack 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. Blackjack hand value

Blackjack hand value analysis involved creating subsets of data and conducting Chi-square tests on each subset. Opening hands are the value of the first two cards dealt. Final hand value is the hand value at the end of the game. The dealer's final hand value is based on the fixed rules of the game. The player's final hand value is dependent on the player's strategy choice, so it has no theoretical basis for comparison.

The null hypothesis for the chi-square test is that the observed frequencies of each type of hand match 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 blackjack opening hand value statistics tests.

1.1 Player's opening score (from first two cards):

Test No.	DOF	ChiSqr	P-Value
1	17	18.91	0.33396
2	17	27.66	0.04911
3	17	20.59	0.24524
4	17	23.76	0.12599
5	17	9.52	0.92239
6	17	19.25	0.31423
7	17	14.15	0.65631
8	17	22.23	0.17604
9	17	16.80	0.46768
10	17	13.51	0.70109
11	17	15.34	0.57074
12	17	20.28	0.26004
13	17	17.28	0.43565

Test No.	DOF	ChiSqr	P-Value
14	17	18.54	0.35546
15	17	19.18	0.31853
16	17	14.05	0.66358
17	17	10.42	0.88492
18	17	16.43	0.49338
19	17	21.77	0.19378
20	17	15.42	0.56512
21	17	21.84	0.19099
22	17	15.46	0.56255
23	17	28.29	0.04164
24	17	18.70	0.34593
25	17	11.82	0.81097
26	17	17.54	0.41823
27	17	14.73	0.61500
28	17	20.25	0.26173
29	17	27.59	0.04992
30	17	14.17	0.65509
31	17	16.92	0.45989
32	17	25.67	0.08066
33	17	13.48	0.70342
34	17	19.85	0.28173
35	17	18.92	0.33320
36	17	16.82	0.46663
37	17	11.03	0.85496
38	17	14.46	0.63404
39	17	16.09	0.51763
40	17	13.85	0.67801
41	17	11.93	0.80456
42	17	14.06	0.66300
43	17	8.69	0.94960
44	17	16.31	0.50193

Test No.	DOF	ChiSqr	P-Value
45	17	27.04	0.05745
46	17	14.00	0.66737
47	17	7.87	0.96928
48	17	11.19	0.84675
49	17	11.57	0.82536
50	17	17.12	0.44627
51	17	9.95	0.90564
52	17	26.15	0.07173
53	17	23.73	0.12698
54	17	11.66	0.81999
55	17	12.87	0.74515
56	17	14.84	0.60690
57	17	9.80	0.91176
58	17	27.77	0.04776
59	17	12.64	0.75995
60	17	10.23	0.89350
61	17	11.83	0.81036
62	17	6.50	0.98910
63	17	14.11	0.65944
64	17	14.84	0.60725
65	17	22.45	0.16792
66	17	16.06	0.51926
67	17	17.99	0.38940
68	17	13.19	0.72369
69	17	13.43	0.70688
70	17	20.60	0.24479
71	17	17.68	0.40907
72	17	5.24	0.99701
73	17	25.68	0.08042
74	17	13.74	0.68530
75	17	18.76	0.34262

Test No.	DOF	ChiSqr	P-Value
76	17	15.98	0.52525
77	17	25.57	0.08273
78	17	19.44	0.30390
79	17	21.48	0.20567
80	17	7.10	0.98220
81	17	16.98	0.45590
82	17	20.52	0.24849
83	17	22.22	0.17634
84	17	14.07	0.66234
85	17	10.59	0.87714
86	17	26.40	0.06742
87	17	14.73	0.61463
88	17	19.59	0.29591
89	17	11.61	0.82323
90	17	15.44	0.56416
91	17	16.62	0.48046
92	17	16.25	0.50602
93	17	23.40	0.13670
94	17	25.49	0.08424
95	17	9.16	0.93497
96	17	14.74	0.61396
97	17	12.75	0.75288
98	17	14.65	0.62038
99	17	7.10	0.98227
100	17	23.27	0.14061
Combined P-Value for 100 tests (Using KS method)			0.97767

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 Dealer's opening score (from first two cards):

Test No.	DOF	ChiSqr	P-Value
1	17	19.17	0.31863
2	17	14.58	0.62572
3	17	20.27	0.26063
4	17	15.71	0.54469
5	17	14.63	0.62197
6	17	21.54	0.20320
7	17	16.43	0.49370
8	17	15.34	0.57087
9	17	26.98	0.05831
10	17	8.06	0.96527
11	17	15.77	0.53995
12	17	24.97	0.09536
13	17	14.97	0.59779
14	17	26.28	0.06943
15	17	15.10	0.58856
16	17	19.51	0.30030
17	17	16.34	0.50021
18	17	15.42	0.56551
19	17	17.59	0.41529
20	17	12.76	0.75198
21	17	13.45	0.70580
22	17	9.14	0.93590
23	17	12.83	0.74769
24	17	16.28	0.50392
25	17	27.69	0.04871
26	17	18.42	0.36260
27	17	14.20	0.65313
28	17	10.98	0.85782
29	17	24.62	0.10350
30	17	12.12	0.79278

Test No.	DOF	ChiSqr	P-Value
31	17	12.86	0.74578
32	17	9.23	0.93270
33	17	23.03	0.14839
34	17	6.99	0.98366
35	17	22.69	0.15962
36	17	8.89	0.94372
37	17	19.84	0.28273
38	17	11.56	0.82600
39	17	8.00	0.96662
40	17	39.37	0.00159
41	17	31.70	0.01642
42	17	16.46	0.49163
43	17	20.30	0.25898
44	17	19.68	0.29077
45	17	29.54	0.02987
46	17	12.55	0.76583
47	17	21.47	0.20589
48	17	26.57	0.06468
49	17	16.12	0.51562
50	17	19.85	0.28197
51	17	18.91	0.33397
52	17	10.92	0.86064
53	17	18.69	0.34635
54	17	15.21	0.58059
55	17	20.59	0.24494
56	17	23.03	0.14815
57	17	11.23	0.84428
58	17	20.85	0.23308
59	17	15.83	0.53607
60	17	15.18	0.58257
61	17	16.50	0.48902

Test No.	DOF	ChiSqr	P-Value
62	17	16.90	0.46149
63	17	20.43	0.25285
64	17	9.15	0.93539
65	17	17.76	0.40404
66	17	17.93	0.39314
67	17	15.71	0.54418
68	17	15.80	0.53836
69	17	12.89	0.74329
70	17	17.36	0.42995
71	17	17.78	0.40265
72	17	10.52	0.88029
73	17	17.56	0.41679
74	17	22.61	0.16232
75	17	13.44	0.70657
76	17	13.22	0.72130
77	17	18.34	0.36790
78	17	29.26	0.03224
79	17	18.47	0.35970
80	17	12.00	0.80026
81	17	10.78	0.86790
82	17	19.26	0.31382
83	17	17.17	0.44262
84	17	20.47	0.25068
85	17	19.82	0.28375
86	17	19.32	0.31031
87	17	18.48	0.35943
88	17	9.53	0.92224
89	17	15.73	0.54339
90	17	22.22	0.17645
91	17	17.77	0.40360
92	17	17.87	0.39694

Test No.	DOF	ChiSqr	P-Value
93	17	13.75	0.68466
94	17	15.23	0.57888
95	17	25.12	0.09209
96	17	13.93	0.67223
97	17	12.27	0.78362
98	17	12.78	0.75048
99	17	27.63	0.04948
100	17	18.14	0.38023
Combined P-Value for 100 tests (Using KS method)			0.49172

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.

1.3 Dealer's final score (total of all cards for hands with 3 or more cards):

Test No.	DOF	ChiSqr	P-Value
1	50	45.48	0.65517
2	50	44.44	0.69512
3	50	49.99	0.47398
4	50	45.84	0.64086
5	50	42.97	0.74906
6	50	58.76	0.18539
7	50	50.57	0.45090
8	50	49.74	0.48385
9	50	62.44	0.11143
10	50	47.82	0.56134
11	50	60.17	0.15362
12	50	47.52	0.57346
13	50	51.49	0.41539
14	50	50.33	0.46027
15	50	44.65	0.68723
16	50	36.75	0.91870

Test No.	DOF	ChiSqr	P-Value
17	50	57.60	0.21463
18	50	46.78	0.60323
19	50	55.42	0.27774
20	50	60.38	0.14930
21	50	46.25	0.62478
22	50	42.39	0.76919
23	50	41.76	0.79000
24	50	61.75	0.12322
25	50	57.16	0.22651
26	50	50.70	0.44559
27	50	48.11	0.54937
28	50	46.66	0.60810
29	50	40.17	0.83852
30	50	49.53	0.49227
31	50	57.85	0.20803
32	50	43.59	0.72670
33	50	64.38	0.08305
34	50	59.47	0.16885
35	50	56.07	0.25785
36	50	52.42	0.38027
37	50	49.18	0.50610
38	50	41.47	0.79919
39	50	59.06	0.17812
40	50	50.91	0.43769
41	50	57.57	0.21536
42	50	44.45	0.69503
43	50	30.53	0.98648
44	50	59.02	0.17925
45	50	51.83	0.40239
46	50	45.07	0.67123
47	50	55.30	0.28142

Test No.	DOF	ChiSqr	P-Value
48	50	38.69	0.87740
49	50	44.77	0.68269
50	50	49.59	0.48989
51	50	59.27	0.17337
52	50	47.88	0.55902
53	50	57.63	0.21386
54	50	45.96	0.63611
55	50	41.37	0.80248
56	50	55.50	0.27514
57	50	50.04	0.47183
58	50	36.42	0.92462
59	50	41.90	0.78537
60	50	67.75	0.04797
61	50	55.89	0.26308
62	50	55.41	0.27806
63	50	50.30	0.46143
64	50	49.38	0.49813
65	50	69.77	0.03375
66	50	44.30	0.70063
67	50	54.06	0.32212
68	50	57.32	0.22205
69	50	43.20	0.74092
70	50	48.26	0.54325
71	50	51.90	0.39986
72	50	72.66	0.01981
73	50	49.86	0.47890
74	50	59.73	0.16309
75	50	54.43	0.30976
76	50	50.87	0.43929
77	50	33.77	0.96187
78	50	49.28	0.50231

Test No.	DOF	ChiSqr	P-Value
79	50	42.15	0.77729
80	50	60.26	0.15169
81	50	65.90	0.06523
82	50	56.85	0.23506
83	50	51.76	0.40491
84	50	47.58	0.57108
85	50	67.90	0.04672
86	50	72.13	0.02189
87	50	48.57	0.53076
88	50	50.28	0.46220
89	50	69.38	0.03614
90	50	57.85	0.20803
91	50	58.88	0.18247
92	50	54.85	0.29577
93	50	55.48	0.27590
94	50	44.78	0.68225
95	50	54.91	0.29378
96	50	44.40	0.69659
97	50	45.23	0.66477
98	50	44.31	0.70007
99	50	50.77	0.44318
100	50	46.30	0.62273
Combined P-Value for 100 tests (Using KS method)			0.03710

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. Blackjack rank statistics

The blackjack rank analysis aims to establish that the rank of the cards to player and dealer was equally distributed in one of the 13 possible ranks (2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K, A).

The blackjack 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 Blackjack rank statistics for all player cards:

Test No.	DOF	ChiSqr	P-Value
1	12	11.55	0.48276
2	12	11.81	0.46104
3	12	9.95	0.62020
4	12	8.00	0.78485
5	12	9.30	0.67713
6	12	16.75	0.15935
7	12	14.38	0.27737
8	12	9.55	0.65494
9	12	9.82	0.63143
10	12	15.89	0.19654
11	12	11.66	0.47344
12	12	6.83	0.86872
13	12	10.88	0.53906
14	12	8.33	0.75899
15	12	10.72	0.55313
16	12	7.17	0.84620
17	12	14.83	0.25108
18	12	12.52	0.40525
19	12	6.51	0.88800
20	12	13.83	0.31141
21	12	12.86	0.37902
22	12	14.35	0.27877
23	12	9.86	0.62814
24	12	13.22	0.35291
25	12	11.30	0.50300
26	12	15.52	0.21439
27	12	13.27	0.34992
28	12	9.87	0.62712
29	12	16.96	0.15092
30	12	12.06	0.44121

Test No.	DOF	ChiSqr	P-Value
31	12	9.13	0.69176
32	12	15.77	0.20186
33	12	9.53	0.65670
34	12	17.43	0.13422
35	12	4.22	0.97919
36	12	7.30	0.83685
37	12	4.59	0.97032
38	12	13.61	0.32617
39	12	11.64	0.47471
40	12	9.12	0.69234
41	12	3.77	0.98723
42	12	9.87	0.62704
43	12	3.67	0.98872
44	12	9.79	0.63396
45	12	13.11	0.36115
46	12	7.01	0.85690
47	12	7.73	0.80614
48	12	8.04	0.78175
49	12	8.77	0.72283
50	12	7.00	0.85779
51	12	14.06	0.29697
52	12	29.88	0.00291
53	12	16.96	0.15099
54	12	16.05	0.18917
55	12	7.77	0.80294
56	12	14.87	0.24849
57	12	12.25	0.42572
58	12	16.02	0.19026
59	12	7.16	0.84653
60	12	18.76	0.09454
61	12	9.85	0.62924

Test No.	DOF	ChiSqr	P-Value
62	12	14.13	0.29260
63	12	16.96	0.15103
64	12	7.10	0.85071
65	12	12.45	0.41035
66	12	7.88	0.79419
67	12	10.16	0.60204
68	12	6.01	0.91566
69	12	12.77	0.38601
70	12	8.51	0.74410
71	12	20.23	0.06295
72	12	6.93	0.86192
73	12	8.69	0.72928
74	12	23.60	0.02303
75	12	13.30	0.34763
76	12	14.16	0.29069
77	12	6.90	0.86433
78	12	8.93	0.70875
79	12	9.37	0.67072
80	12	9.99	0.61689
81	12	17.32	0.13800
82	12	6.73	0.87498
83	12	12.78	0.38546
84	12	11.38	0.49702
85	12	11.00	0.52934
86	12	16.13	0.18556
87	12	9.65	0.64659
88	12	14.24	0.28573
89	12	8.23	0.76707
90	12	12.14	0.43487
91	12	6.62	0.88158
92	12	15.66	0.20748

Test No.	DOF	ChiSqr	P-Value
93	12	15.30	0.22520
94	12	17.68	0.12561
95	12	19.20	0.08375
96	12	13.20	0.35464
97	12	13.09	0.36281
98	12	8.71	0.72718
99	12	5.87	0.92248
100	12	13.38	0.34171
Combined P-Value for 100 tests (Using KS method)			0.60028

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 Blackjack rank statistics for all dealer cards:

Test No.	DOF	ChiSqr	P-Value
1	12	10.46	0.57524
2	12	28.36	0.00490
3	12	15.53	0.21396
4	12	11.50	0.48637
5	12	7.48	0.82442
6	12	12.96	0.37195
7	12	18.53	0.10047
8	12	10.27	0.59233
9	12	10.81	0.54521
10	12	22.16	0.03582
11	12	8.44	0.75004
12	12	10.05	0.61141
13	12	4.46	0.97368
14	12	12.72	0.38992
15	12	17.97	0.11654
16	12	19.04	0.08756

Test No.	DOF	ChiSqr	P-Value
17	12	14.12	0.29309
18	12	16.48	0.17036
19	12	21.20	0.04747
20	12	16.15	0.18462
21	12	22.66	0.03076
22	12	15.43	0.21886
23	12	10.95	0.53310
24	12	21.30	0.04610
25	12	5.01	0.95775
26	12	12.93	0.37421
27	12	10.28	0.59107
28	12	4.97	0.95893
29	12	11.68	0.47169
30	12	4.29	0.97763
31	12	8.67	0.73075
32	12	5.70	0.93026
33	12	10.51	0.57120
34	12	22.24	0.03489
35	12	18.11	0.11237
36	12	10.70	0.55473
37	12	14.91	0.24640
38	12	7.49	0.82397
39	12	9.67	0.64472
40	12	6.98	0.85924
41	12	14.16	0.29057
42	12	6.85	0.86707
43	12	17.65	0.12670
44	12	15.86	0.19756
45	12	12.44	0.41088
46	12	8.46	0.74784
47	12	11.70	0.47038

Test No.	DOF	ChiSqr	P-Value
48	12	20.12	0.06490
49	12	13.73	0.31842
50	12	10.48	0.57428
51	12	3.33	0.99278
52	12	22.63	0.03099
53	12	12.04	0.44264
54	12	6.68	0.87796
55	12	12.18	0.43141
56	12	18.39	0.10447
57	12	7.23	0.84239
58	12	18.18	0.11021
59	12	21.23	0.04718
60	12	6.81	0.86985
61	12	18.06	0.11403
62	12	11.15	0.51570
63	12	7.61	0.81472
64	12	12.74	0.38851
65	12	18.55	0.09996
66	12	20.98	0.05074
67	12	4.53	0.97176
68	12	6.56	0.88515
69	12	8.66	0.73177
70	12	11.91	0.45318
71	12	15.04	0.23936
72	12	13.02	0.36730
73	12	6.27	0.90189
74	12	18.74	0.09490
75	12	10.57	0.56594
76	12	17.01	0.14931
77	12	19.25	0.08263
78	12	15.61	0.20994

Test No.	DOF	ChiSqr	P-Value
79	12	11.86	0.45672
80	12	4.93	0.96044
81	12	12.49	0.40752
82	12	7.51	0.82201
83	12	7.04	0.85500
84	12	15.53	0.21390
85	12	11.58	0.48004
86	12	3.81	0.98666
87	12	7.70	0.80821
88	12	14.57	0.26601
89	12	13.91	0.30662
90	12	5.54	0.93761
91	12	13.53	0.33184
92	12	15.17	0.23203
93	12	20.11	0.06509
94	12	11.91	0.45333
95	12	9.60	0.65114
96	12	9.42	0.66708
97	12	18.31	0.10664
98	12	13.82	0.31218
99	12	9.95	0.62055
100	12	13.69	0.32070
Combined P-Value for 100 tests (Using KS method)			0.33133

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. Summary of the analysis of blackjack tests

The Blackjack cards analysis is completed by combining the result of the KS Test performed in the two types of analysis (Hand Values and Ranks) for using Holm's method and producing a single Combined P-value. The combined p-value produced using Holm's method is used as an indication of statistical randomness.

Combination of p-values using Holm's Method		
Test	P-Value	P-Adjusted
Opening Score (Player)	0.97767	1.00000
Opening Score (Dealer)	0.49172	1.00000
Dealer's Final Score	0.03710	0.18548
Player Cards Rank	0.60028	1.00000
Dealer Cards Rank	0.33133	1.00000
Combined P-Value using Holm's Method		0.18548

Notes:

- 1) The combined p-value of all statistical tests using Holm's Method conducted for blackjack 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 blackjack indicates that the RNG is working correctly.

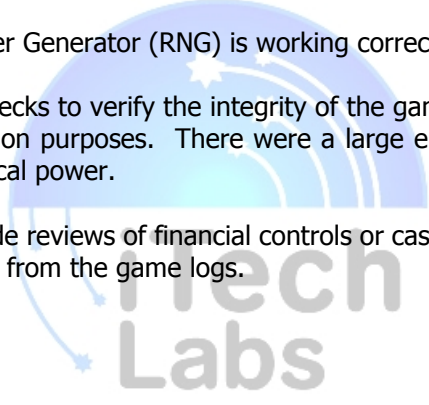
4. Conclusion

Analysis of actual data from game logs for 'player opening score', 'dealer opening score', 'dealer final score', 'player card rank' and 'dealer card rank' indicated statistical randomness. The results were satisfactory for 8 decks blackjack.

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

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.

The scope of the review did not include reviews of financial controls or casino operations. We believe that the probabilities were calculated correctly from the game logs.



Signed:

James Boje
Managing Director EMEA
Executive
Date: 01 April 2026