

The Madness of Analytics

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Sixth Grade





Objectives

- To develop a sports analytics model using available resources
- Use the model to predict the Final Four teams in the March Madness Tournament

GOAL: To get 100% of the teams correct.



Assumptions

- Due to the cancelation of the 2020 March Madness Tournament, the 2019 season statistics were used for this project.
- The ESPN 2019 Tournament Bracket was used to determine the 64 participating teams.
- By using the 2019 bracket, the model could be tested against the true outcome of the tournament.



Method

- **Step 1:** Find the Offensive Rating using this equation:

$$\text{Offensive Rating} = (.4 * \text{Team eFG\%}) + .25(1 - \text{Team TO rate}) + (.2 * \text{Team Off Reb\%}) + (.15 * \text{Team FT Rate})$$

Where:

eFG%= effective field goal %= adjusts the fact that a 3 point field goal is worth one more point than a 2 point field goal

TO rate= an estimate of turnovers/100 plays

Team Off Reb%= an estimate of the percentage of available offensive rebounds a player grabbed while he was on the floor

FT Rate= free throws/field goal attempt



Method cont.

- **Step 2:** Find the Defensive Rating use this equation:

$$\text{Defensive Rating} = (.4 * 1 - \text{Opp Team eFG\%}) + (.25 * \text{Opp Team TO rate}) + (.2 * 1 - \text{Opp Off Reb\%}) + (.15 * 1 - \text{Opp Team FT rate})$$

Where:

eFG%= effective field goal %= adjusts the fact that a 3 point field goal is worth one more point than a 2 point field goal

TO rate= an estimate of turnovers/100 plays

Opp Off Reb%= an estimate of the percentage of available offensive rebounds a player grabbed while he was on the floor

FT Rate= free throws/field goal attempt



Method cont.

- **Step 3:** Find the Total Rating

Where: Total Rating = Offensive Rating + Defensive Rating

Compare the Total Rating for each team in the match-up. The higher Total Rating wins the game.

Ex. Duke (Total Rating 1.0607) vs. North Dakota State (Total Rating 1.0032)

Duke has a higher rating and therefore should win the game. They did win 85-62.

Data for the East Corner of the Bracket

Rank	Team	Offensive Rating	Defensive Rating	Total Rating
1	Duke	0.5322	0.5285	1.0607
16	North Dakota St.	0.50875	0.4944	1.00315
8	VCU	0.5068	0.527	1.0338
9	UCF	0.52495	0.5199	1.04485
5	Mississippi St.	0.53145	0.498	1.02945
12	Liberty	0.5208	0.523	1.0438
4	Virginia Tech	0.52925	0.519	1.04825
13	Saint Louis	0.5036	0.51965	1.02325
6	Maryland	0.51895	0.5188	1.03775
11	Belmont	0.5296	0.51625	1.04585
3	LSU	0.5313	0.49915	1.03045
14	Yale	0.5183	0.5137	1.032
7	Louisville	0.51425	0.5132	1.02745
10	Minnesota	0.51055	0.5037	1.01425
2	Michigan St.	0.53515	0.5272	1.06235
15	Bradley	0.49805	0.5097	1.00775

Data for the West Corner of the Bracket

Rank	Team	Offensive Rating	Defensive Rating	Total Rating
1	Gonzaga	0.5544	0.53545	1.08985
16	Fairleigh Dickenson	0.5214	0.4947	1.0161
8	Syracuse	0.50645	0.50335	1.0098
9	Baylor	0.52185	0.4987	1.02055
5	Marquette	0.51985	0.51205	1.0319
12	Murray St.	0.53555	0.5191	1.05465
4	Florida St.	0.51615	0.51505	1.0312
13	Vermont	0.52045	0.52755	1.048
6	Buffalo	0.52685	0.5199	1.04675
11	Arizona St.	0.51945	0.50395	1.0234
3	Texas Tech	0.51325	0.53425	1.0475
14	Northern Kentucky	0.5288	0.51135	1.04015
7	Nevada	0.5301	0.52395	1.05405
10	Florida	0.5043	0.50645	1.01075
2	Michigan	0.5024	0.5409	1.0433
15	Montana	0.5227	0.5064	1.0291

Data for the South Corner of the Bracket

Rank	Team	Offensive Rating	Defensive Rating	Total Rating
1	Virginia	0.5306	0.53405	1.06465
16	Gardner-Webb	0.52505	0.50635	1.0314
8	Mississippi	0.5189	0.49695	1.01585
9	Oklahoma	0.498	0.51825	1.01625
5	Wisconsin	0.49705	0.5283	1.02535
12	Oregon	0.5095	0.5178	1.0273
4	Kansas St.	0.4966	0.5257	1.0223
13	UC Irvine	0.5176	0.52255	1.04015
6	Villinova	0.52515	0.50255	1.0277
11	Saint Mary's	0.52395	0.5132	1.03715
3	Purdue	0.5305	0.50695	1.03745
14	Old Dominion	0.4933	0.52715	1.02045
7	Cincinnati	0.5263	0.5132	1.0395
10	Iowa	0.529	0.49615	1.02515
2	Tennessee	0.5368	0.5066	1.0434
15	Colgate	0.5213	0.5045	1.0258

Data for the Midwest Corner of the Bracket

Rank	Team	Offensive Rating	Defensive Rating	Total Rating
1	North Carolina	0.5283	0.52165	1.04995
16	Iona	0.51335	0.49195	1.0053
8	Utah St.	0.5306	0.52255	1.05315
9	Washington	0.50865	0.5061	1.01475
5	Auburn	0.5278	0.49695	1.02475
12	New Mexico St.	0.5365	0.52355	1.06005
4	Kansas	0.5143	0.51305	1.02735
13	Northeastern	0.52195	0.49925	1.0212
6	Iowa St.	0.52425	0.5106	1.03485
11	Ohio St.	0.50245	0.5102	1.01265
3	Houston	0.52455	0.5299	1.05445
14	Georgia St.	0.5124	0.49515	1.00755
7	Wofford	0.54175	0.5193	1.06105
10	Seton Hall	0.50725	0.49985	1.0071
2	Kentucky	0.54155	0.5241	1.06565
15	Abilene Christ.	0.4999	0.5139	1.0138



Prediction

- Based on the calculations the Final Four Teams are:

Michigan State (2)

Gonzaga (1)

Virginia (1)

Kentucky (2)



Results

- The actual Final Four Teams in the 2019 March Madness Tournament:

Michigan State (2)

Texas Tech (3)

Auburn (5)

Virginia (1)



Conclusion

- The calculation was correct in predicting 50% the Final Four teams.



References

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