

Supplementary material for “Modeling March Madness,” by Matthew Menzel (*Math Horizons*, February 2017, pp. 5–7).

Table 1 contains the records of n -seeds versus m -seeds in the NCAA Division I Men’s Basketball Tournament 1985–2016.

We created a table of probabilities (table 2) using the following six rules and the requirement that $P(m \text{ defeats } n) = 1 - P(n \text{ defeats } m)$. The rules are listed in order of priority. So, we applied rule 1 to as many cells as possible, then rule 2, and so on until the table was filled. The cells are color coded as described below.

- 1) When teams with identical seeds play, the probability of each winning is 0.5. (black)
- 2) The probability of a 16-seed defeating a 1-seed is 0.001, and the probability of a 12- or 13-seed defeating a 1-seed is 0.040. (brown)
- 3) For seed matchups that have occurred at least 20 times, probabilities are computed as winning percentages. (red)
- 4) If adjacent seeds can be combined to produce matchups that have occurred at least 15 times in the same or consecutive rounds, their probabilities are estimated based on combined winning percentages. (green)
- 5) Probabilities for matchups that could occur during the first three rounds are filled in linearly, holding the larger seed fixed. (blue)
- 6) For the remaining cells, the probability of the better-seeded team winning is assigned to be 0.55. (purple)

vs.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	18-18	29-33	12-16	17-41	7-36	3-8	1-5	13-53	5-60	1-5	3-3	0-19	0-4	0-0	0-0	0-128
2	33-29	3-3	18-31	4-3	4-0	7-24	21-54	5-2	1-0	18-27	1-13	0-1	0-0	0-0	8-120	0-0
3	16-12	31-18	1-1	3-4	1-2	28-38	5-7	0-2	0-1	4-9	14-28	0-0	0-0	21-107	0-1	0-0
4	41-17	3-4	4-3	1-1	32-36	2-2	2-2	5-3	0-2	0-2	0-0	12-23	26-102	0-0	0-0	0-0
5	36-7	0-4	2-1	36-32	1-1	0-1	0-0	2-1	1-1	0-1	0-0	46-82	3-12	0-0	0-0	0-0
6	8-3	24-7	38-28	2-2	1-0	0-0	3-4	1-0	0-0	2-4	46-82	0-0	0-0	2-14	0-0	0-0
7	5-1	54-21	7-5	2-2	0-0	4-3	0-0	1-1	0-0	50-78	3-0	0-0	0-0	0-1	1-2	0-0
8	53-13	2-5	2-0	3-5	1-2	0-1	1-1	0-0	64-64	0-0	0-1	1-0	0-1	0-0	0-0	0-0
9	60-5	0-1	1-0	2-0	1-1	0-0	0-0	64-64	0-0	0-0	0-0	0-0	0-1	0-0	0-0	0-0
10	5-1	27-18	9-4	2-0	1-0	4-2	78-50	0-0	0-0	0-0	2-1	0-0	0-0	0-1	0-5	0-0
11	3-3	13-1	28-14	0-0	0-0	82-46	0-3	1-0	0-0	1-2	0-0	0-0	0-0	0-5	0-0	0-0
12	19-0	1-0	0-0	23-12	82-46	0-0	0-0	0-1	0-0	0-0	0-0	0-0	3-8	0-0	0-0	0-0
13	4-0	0-0	0-0	102-26	12-3	0-0	0-0	1-0	1-0	0-0	0-0	8-3	0-0	0-0	0-0	0-0
14	0-0	0-0	107-21	0-0	0-0	14-2	1-0	0-0	0-0	1-0	5-0	0-0	0-0	0-0	0-0	0-0
15	0-0	120-8	1-0	0-0	0-0	0-0	2-1	0-0	0-0	5-0	0-0	0-0	0-0	0-0	0-0	0-0
16	128-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0

Table 1. Records of *n*-seeds versus *m*-seeds in the NCAA Division I Men's Basketball Tournament 1985–2016.

vs.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0.500	0.468	0.429	0.293	0.163	0.253	0.285	0.197	0.077	0.450	0.450	0.040	0.040	0.450	0.450	0.001
2	0.532	0.500	0.367	0.332	0.280	0.226	0.280	0.414	0.367	0.400	0.281	0.091	0.450	0.133	0.063	0.450
3	0.571	0.633	0.500	0.442	0.385	0.424	0.359	0.486	0.417	0.317	0.333	0.450	0.450	0.164	0.084	0.450
4	0.707	0.668	0.558	0.500	0.471	0.417	0.471	0.441	0.353	0.450	0.450	0.343	0.203	0.450	0.450	0.101
5	0.837	0.720	0.625	0.529	0.500	0.450	0.450	0.519	0.440	0.450	0.450	0.359	0.276	0.450	0.450	0.134
6	0.747	0.774	0.576	0.583	0.550	0.500	0.456	0.450	0.450	0.500	0.359	0.450	0.450	0.171	0.150	0.450
7	0.715	0.720	0.641	0.529	0.550	0.544	0.500	0.450	0.450	0.391	0.387	0.450	0.450	0.143	0.150	0.450
8	0.803	0.586	0.514	0.559	0.481	0.550	0.550	0.500	0.500	0.450	0.450	0.407	0.335	0.450	0.450	0.234
9	0.923	0.633	0.583	0.647	0.560	0.550	0.550	0.500	0.500	0.450	0.450	0.423	0.368	0.450	0.450	0.267
10	0.550	0.600	0.683	0.550	0.550	0.500	0.609	0.550	0.550	0.500	0.472	0.450	0.450	0.378	0.281	0.450
11	0.550	0.719	0.667	0.550	0.550	0.641	0.613	0.550	0.550	0.528	0.500	0.450	0.450	0.136	0.325	0.450
12	0.960	0.909	0.550	0.657	0.641	0.550	0.550	0.593	0.577	0.550	0.550	0.500	0.188	0.450	0.450	0.367
13	0.960	0.550	0.550	0.797	0.724	0.550	0.550	0.665	0.632	0.550	0.550	0.813	0.500	0.450	0.450	0.401
14	0.550	0.867	0.836	0.550	0.550	0.829	0.857	0.550	0.550	0.622	0.864	0.550	0.550	0.500	0.456	0.450
15	0.550	0.938	0.916	0.550	0.550	0.850	0.850	0.550	0.550	0.719	0.675	0.550	0.550	0.544	0.500	0.450
16	0.999	0.550	0.550	0.899	0.866	0.550	0.550	0.766	0.733	0.550	0.550	0.633	0.599	0.550	0.550	0.500

Table 2. Our probability model for n -seeds versus m -seeds.