Homework Assignment 3—Extra Credit
CS 330 Discrete Structures
Spring Semester, 2015

Due: Monday, March 9, 2015

On the back of this sheet is an article from the *Chicago Tribune* today (March 4, 2015) that has several probabilistic claims. I know nothing about sports in general, or the contests here in particular, so for 10 points extra credit, explain and derive all the probabilities discussed in this article.
Bracket perfection is nearly impossible

BY LIZZIE JOHNSON

Tribune reporter

The probability of creating the perfect March Madness bracket is shockingly low — less than 1 chance in 9.2 quintillion (or 9,223,372,036,854,775,808) chances.

Jeff Bergen, a mathematics professor at DePaul University, crunched the numbers and discovered that it was nearly impossible to create the winningest bracket.

"The size of the number astounds people," he said. "It's just not going to happen."

It's more likely that the Chicago Cubs and the Chicago White Sox will win the next 16 World Series games, he said.

"If you want to sit down and do an experiment, grab a coin and flip it 53 times in a row," Bergen said. "Every time you get a tail, that is basically a failed bracket. The only way to get a perfect bracket is if you flip heads 53 times in a row."

Bergen calculated the likelihood by determining the percentage of chance some someone would correctly guess the winner of each bracket, then multiplying the 53 numbers together.

There are exceptions, Bergen conceded. If you had a knowledge of basketball and the teams involved, that would up your odds. But not by much.

"Suppose you know that a No. 1 seed has never lost to a No. 16 seed in the men's tournament," he said. "That would help improve your odds."

The chances of creating a perfect bracket with knowledge of the teams would still be only about 1 in 128 billion with those odds. Additionally, the chances of having a perfect bracket after the first round is about 1 in 17,000, he said.

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