
Although most of the time it will be ok for you to work together on assignments, I would like each person to do this first assignment entirely on his or her own.

1. Write a brief (1-2 page) biography of yourself. (Make sure it is coherent and grammatical.) What is your background? What is your mathematical background? How did you get interested in math? What are you hoping to do? Will math be involved in it? Anything else of interest? (“*Numb3rs* was my favorite television program when I was a kid.” ... “I am from East Lansing, and Nate Silver is my hero.” ...)

2. TRUE STORY:

Many years ago the State of Michigan held a lottery in two rounds. In the first round, 1200 people were selected and asked to come to the convention center in downtown Lansing on a particular day, at a particular time. As the people showed up, each was given a number, 0000 through 1199. Ten final winners were then picked and given a nontrivial amount of cash.

The ten winners were chosen by number, using one of those machines that selects at random ping pong balls from a drum full of balls, each with a digit 0-9, each digit being on the same number of balls in the drum. (After each drawing of a ball, it was returned to the drum before the next draw.)

The algorithm for choosing each of the ten winning numbers $ABCD$ from the range 0000-1199 was:

(a) First a digit A was chosen from the machine. If it clearly would not produce a winner, then the ball was returned to the machine and another selected. (That is, if 7 was selected to be A , then there could be no winner, since A can only be 0 or 1 in a winner. So balls were selected until either a 0 or 1 came up for A .)

(b) Once A was selected, then B was selected. Again, candidates for B were selected until a legal combination AB was found.

(c) Once A and B were selected, then C was selected to produce a legal combination ABC .

(d) Once A , B , and C were selected, a final D was selected to produce a legal combination $ABCD$ as one of the winners.

A few days after this happened, one of the math department secretaries caught me in the hallway of Wells Hall and asked if I would talk to someone who was on the phone. It turned out that it was one of the 1200 people. After he explained the rules to me, he then said:

“My number started with 0. But every one of the ten numbers they ended up choosing started with 1. I don’t think that’s fair. Is it?”

What do you think of the man’s complaint? Did he have just cause to feel he was treated unfairly? Write an essay (again coherent, grammatical, and not too long) discussing the man’s concern and the fairness of the algorithm for picking winners.