

CS 2802: Homework 11

November 8, 2020

Handed out Nov. 9, due Nov. 30 (after the break)

- Read Chapter 20.1–20.3 in MCS and Chapter 13.3 in the handout from Rosen on finite automata (posted on CMS).
- Do the following problems:
 - 20.2(a), (b) (Again, carefully specify the sample space, the probability on it, and the relevant random variables on it.)
 - 20.7 (You must explain your answer in this and the next questions.)
 - 20.8
 - 20.20
 - 13.3, 8 (If you think it’s true, prove it. If you think it’s false, give a counterexample.)
 - 13.3, 12 (just a “yes” or “no” suffices; no proof needed)
 - 13.3, 14
 - 13.3, 16 (just state the language in the next three exercises; no need for a proof of correctness)
 - 13.3, 18
 - 13.3, 20
 - Challenge problem (you don’t have to hand this in): I can’t resist pointing out this one. Each week, on the site fivethirty.com, there’s a column called “The Riddler” that has two puzzles (“Riddler Express” and “Riddler Classic”). Last year there was a Riddle Classic that was a fun variant of the Monty Hall problem. You can find it at <https://fivethirtyeight.com/features/can-you-beat-the-goat-monty-hall-problem/>. Note that the first paragraph (which talks about the standard Monty Hall problem and says that the probability that you win if you switch is $2/3$). As you should all know by now, that’s not necessarily right! It’s right only if you assume that Monty randomizes when he has a choice about which door to amount. You should make that assumption for the variant problem too (although the Riddler puzzle doesn’t mention it).

Think about (but don't hand in) 19.12(b), 19.26, 19.27, 19.30, 20.1, 20.2(c). There are a lot of things to think about with probability!

For recitation: 20.2; 13.3, 8; 13.3, 16