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Reflection2

Chapter3

It took me a little while to wrap my head around the train problem in this chapter. As Allen said in class, intuitively it is really strange to picture that when you see 60 train cars, the likelihood that there only exist 60 cars is the highest. After thinking about it for a while I think that the best way to understand it is to compare it to the die problem. People probably think that given a certain number of train cars, they will only see a certain fraction of those cars. However because we said that the likelihood to see a set number of train car are all just as like this means that if there are a hundred cars, it is just as likely to see only one compare to seeing all one hundred. In real life this is probably not true. The likelihood of seeing a set number of cars given that there are x number of train cars probably changes. Meaning that if you were to look at a pmf of the number of cars you would see it would not be a uniform line. If you factor this into the dice class that we are using, the most likely number of cars would not be just the number of cars that you’ve seen but rather shifted to the right a little bit.

I think another way to match what we think intuitively is to add in a factor of how many more cars we might see given that we already seen 60. Obviously this would cause for a much more complex system because then you would have to compare in what situation did you see the 60 cars to how much of all the cars that is. I think a way to do this would be to see how often you start to see duplicates. For instance, in the beginning you probably would see mostly different train cars but if you were to observer a rail locations over a long period of time you would probably start to see more and more cars over and over again. This would indicated that you are seeing less new cars and you can probably use this information to show that given you know of 60 different cars, what is the probability that you will see a new car. Then you can factor this into the likelihood equation and then create a new pmf.

From this chapter I also looked at the fortune cookie problem. I think that the way to go about it is to just change the likelihood calculation to reflect the new situation. Before in the dice probably, it was given that this is a x sided dice, what is the likelihood that you would roll a y. That would simply be 1/x. For this new question, the situation is given there are x different number of fortune cookies, what is probability that two people out of 9 get the same. This means not what is the probability that two people get the same but also the other 7 get different ones. Therefore i think the equation for this to be:

This is the equation where two people get the same cookie while everyone else gets different cookies. Along with this you also have to multiply it by 2 choose 9. This is since in the equation above, it is assuming that person 1 and 2 are the people that get the same cookies but there are many other cases like person 1 and 3 or 1 and 4 and so on.

Chapter4

Chapter 4 was something that we had already done a lot in information theory. It feels like it is very similar to the central limit theorem. Where given enough trials, you will start to converge towards the actual ratio/probability. It was kind of neat to see the bayesian aspect where you assume all cases are equally likely in the beginning and then each trial changes the pmf. It was also kind of cool to see that it changes based on a power scale, where each additional trial/update would increase the pmf like by a power.