Tutorial 4

8th September 2020

Problem 1

- You are an avid "Tazo" collector and you love Cheetoz. There are five different special edition Tazos and each Cheetoz packet has any one of them. On average how many packets of Cheetoz must you buy to complete your set of Tazos? i.e you get at least one of all different kinds of tazos.

(Tazos: token/gift in Cheetoz, Cheetoz: Snac)

Problem 11

- A, B and C have gone for a strange game of laser tag. The rules are as follows:

- They are to stand in a triangle.

- They are to fire at their choice of target in succession in the order A, B, C cyclically.

- A hit man loses and gets out of the game(can't shoot and can't be shot at)

- All three know that the A's chances of hitting are 0.3, C's chances are 0.5 and B never misses.
- What is the optimum strategy for A? And what is his best probability for winning?

Problem III

Imagine a drunk tightrope walker, in the middle of a really long tightrope, who manages to keep his balance, but takes a step forward with probability p and takes a step back with probability $(1-p)$.

(a) What is the probability that after two steps the tightrope walker will be at the same place on the rope?

(b) What is the probability that after three steps, the tightrope walker will be one step forward from where he began?

(c) Given that after three steps he has managed to move ahead one step, what is the probability that the first step he took was a step forward?

Problem IV

- A Gambler makes a sequence of independent bets. In each bet he wins one dollar with probability p and loses one dollar with probability (1-p) . Initially he has k dollars and plays until he either accumulates n dollars or has no money left. What is the probability that he ends up with n dollars?