HW1.

Monday, September 14, 2015 12:02 PM

1. a) hit: 1 miss: 0
result (B, G)

{(0,0), (0,1), (1,0), (1,1)} ← S

GE

p(00) = 0.7 × 0.4
= 0.28

event E: {both shoot and exactly one shot hits}.

{(0,1) (1,0)}

b)

	B	G
	1	0
	0	1

16 possible sample points in two times shooting

event E: {both shoot twice and target is hit twice} = {(0011), (0101), (1001), (1100), (1010), (0110)}

G hit ≥ 1

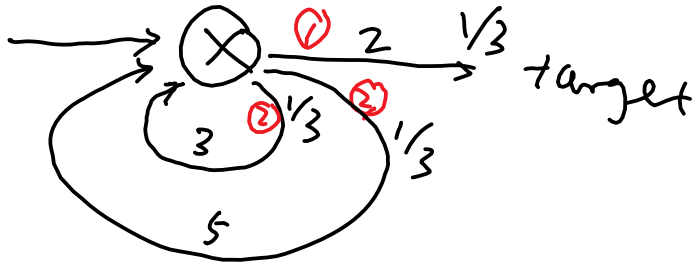
$$E[Y] = E_N\left[E[Y|N=n]\right]$$

$$= E_N[nE[X]]$$

$$= E[X] \cdot E_N[n] = E[X] \cdot E[N]$$

$$E[Y|N=n] = E[X_1 + X_2 + \ldots + X_n]$$

$$= nE[X]$$



(1) Model: r.v. F { path where the fist hop is 1 or 2 or 3 }

r.v. T : { total time spent to reach target } $E[T]$?

(2) Analysis: $E[T|F=1] = 2$, $E[T|F=2] = 3 + E[T]$

$E[T|F=3] = 5 + E[T]$

$$E[T] = E[T|F=1] \cdot P(F=1) + E[T|F=2] \cdot P(F=2) + E[T|F=3] \cdot P(F=3)$$

$$= \frac{1}{3}\left(2 + 3 + E[T] + 5 + E[T]\right)$$

$$E[T] = 2 + 3 + 5 = 10 \text{ sec}$$