

Lab 2

1) Probability of killing 2 enemies out of 6

(P) Probability of success = 0.1

(n) Number of attempts = 6

Number of successes = 2

$$P_x = \binom{n}{x} p^x q^{n-x}$$

$$P_2 = \binom{6}{2} 0.1^2 0.9^{6-2} = 0.09842 \quad \times 100 = 9.842$$

$$= 9.842\%$$

2) Probability of killing at most 3 enemies out of 6

(P) ~~Probability~~ Probability of success = 0.1

(n) Number of attempts = 6

Number of successes = 3

$$P_3 = \binom{6}{3} 0.1^3 0.9^{6-3} = 0.001458$$

$$P_2 = \binom{6}{2} 0.1^2 0.9^{6-2} = 0.09842$$

$$P_1 = \binom{6}{1} 0.1^1 0.9^{6-1} = 0.35429$$

$$0.001458 + 0.09842 + 0.35429 = 0.46729$$

$$= 46.729\%$$

3) Max number of enemies we can kill with 90% probability:

$$x = 15.22$$

$$x > \log(0.1) / \log(0.9) = 21.85$$

$$x = 1.7213$$

4) how many times do you need to shoot to kill the enemy

(P) Probability of success = 0.1

(n) Number of attempts

(X) Number of successes

$$0.9^n = 0.2$$

$$\log(0.9^n) = \log(0.2)$$

$$n \cdot \log(0.9) = \log(0.2)$$

$$n = \log(0.2) / \log(0.9)$$

$$n = 15.22$$