1. Suppose you play the game of shooting. You shoot 6 times, each time to a different enemy, and each shot has a 10% chance of success.

1) What's the probability of killing two enemies out of six?

Probability of success = P = 0.1

Number of Attempts = N = 6

Number of Successes = X = 2

nCx⋅⋅

0.01(0.9)^4

nCx

15\*0.006561

=0.098415

= 9.84%

2) What's the probability of killing at most three enemies out of six?

Probability of success = P = 0.1

Number of Attempts = N = 6

Number of Successes at most = X = 3

nCx⋅⋅

1.

0.1

nCx

6\*0.0059049

=0.0354294

= 35.4%

3.

0.001

nCx

20\*

=0.01458

= 1.458%

Pribability of 1 = 0.354294

Probability of 2 = 0.098415 (from Q1)

Probability of 3 = 0.01458

Probability of at most 3 = 0.354294 + 0.098415 + 0.01458 = 0.1484244 = 46.7289%

3) What's the maximum number of enemies we can kill with 90% probability?

nCx⋅⋅

x > log(0.1) / log(0.90) = 21.85

x =

x =1.7213 round down to 1 max enemy

2. Suppose there is only one enemy and two success shots can kill the enemy. Each shot has a 10% chance of success. How many times do you need to shoot to kill the enemy with 80% probability?

Probability of success = P = 0.1

Number of Attempts = N = N

Number of Successes = X = 2

nCx⋅⋅

(0.9)^n = {1 - (80 / 100)}

Or, (0.9)^n = 0.2

Taking logarithm of both sides to the base 10:

Or, log {(0.9)^n} = log 0.2

Or, n \* log 0.9 = log 0.2

Or, n = (log 0.2) / (log 0.9)

Or, n = 15.27

15.27

=16 shots