Case. 1 for Discrete random variables

$$Mean = E(X)$$

$$Variance = Var(X) = E(X^{2}) - (E(X))^{2}$$

$$Standard \ deviation = \sqrt{E(X^{2}) - (E(X))^{2}}$$

Exercise 1. A random variable X has the probability distribution shown below.

x	1	2	3	4	5
Pr(X=x)	С	0.3	0.1	0.2	0.05

Find:

a. the constant c

b. E(X), the mean of X

c. Var(X), the variance of X, and hence the standard deviation of X

d. Pr $(\mu - 2\sigma \le X \le \mu + 2\sigma)$

Case. 2 for Binomial random variable,

If X is the number of successes in n trials, each with probability of success p, then

$$n = number of trials, p = probability of success, 1 - p = probability of failure$$

$$Mean = E(X) = n \cdot p$$

$$Variance = Var(X) = n \cdot p \cdot (1 - p)$$

$$Standard \ deviation = \sqrt{n \cdot p \cdot (1 - p)}$$

Exercise 2. Stephen Curry's free throw success rate is 90% and Ben Simmons' is 50%. If They each throw 10 free throws, let X be the number of times they make.

a. Find the E(X) (expected times they make).

b. Find Var(X).

Exercise 3. The probability of contracting Covid 19 this winter is known to be 0.2. Of the 100 students at a certain school. How many would the teacher expect to get Covid 19? Find the standard deviation of the number who will get Covid 19 and calculate $\mu \pm 2\sigma$. Interpret the interval $[\mu - 2\sigma, \mu + 2\sigma]$ for this example.