

L6

Probability & Statistics

Bernoulli Distribution.

$$S = \{ \text{success, failure} \}.$$

$$X(S) = 1, \quad X(F) = 0$$

The pmf is $f(x) = p^x (1-p)^{1-x}$, $x \in \{0, 1\}$

$$\mu = p, \quad \sigma^2 = pq = p(1-p).$$

Binomial Distribution.

'n' - independent Bernoulli trials.

$$X(\dots) = X(\underbrace{1001\dots 1}_{n \text{ times}})$$

We are interested to study total number of successes.

Q. What is the probability of having 'x' successes. $x = 1, 2, 3, \dots$
 $x \leq n$

The pmf is

$$f(x) = \binom{n}{x} p^x (1-p)^{n-x},$$

$$x = 0, 1, 2, \dots$$

↓
binomial distribution
denoted by $B(n, p)$ or $b(n, p)$.

Ex p. Suppose that the probability of germination of a beet seed is 0.8 and the germination of a seed is called a success. Suppose we plant 10 seeds and we assume that the germination of one seed is independent of the germination of another seed.

Let x denote the # of seeds germinated.

Q. Find $P(x \leq 6) = ?$

Ans. 0.1209

