Grade 12 Math of Data Management

MDM4U

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Contents

Chapter 2

Normal Distribution

2.1 Approximate Binomial

At certain situation, we can use a normal distribution to approximate a Binomial distribution

Theorem 2.1.1
If X is a binomial random distribution of n independent trials, each with probability of success p, and if

$$np > 5$$
$$n(1-p) > 5$$

then the binomial random variable can be approximated by a normal distribution with

$$\mu = np$$
$$\sigma = \sqrt{np(1-p)}$$

2.2 Approximate Hypergeometric

If the population size N is fairly large, and the sample size is relatively small, we can use a Normal Distribution to simulate Hypergeometric

Theorem 2.2.1
If X is a hypergometric random distribution of n independent trials, each with probability of success p, and if

$$\frac{n}{N} < \tfrac{1}{10}$$
$$n(1-p) > 5$$

then the binomial random variable can be approximated by a normal distribution with

$$\mu = np$$
$$\sigma = \sqrt{np(1-p)}$$