$B(n,p)$ $\begin{cases} p \cdot q \\ \text{independent} \\ x$ 取值 $[0,n] \end{cases}$

n large, p small ↓

$Po(\lambda)$ $\begin{cases} \underline{\text{constant rate}} \\ \text{independent} \\ \text{singly} \\ x$ 取值 $[0,+\infty] \end{cases}$

$N(np, np(1-p))$
n large
$p \approx 0.5$ $np \geqslant 10$

$N(\mu, \sigma^2) \to Z = \dfrac{x-\mu}{\sigma}$

n large $p < 0.2$ $np < 10$
$N(\lambda, \sqrt{\lambda}^2)$

假设检验

① $H_0: \theta = m$. $H_1: \theta >/</\neq m$

② $X \sim B(n,p)$ $Po(\lambda)$

③ $P(X \geqslant 7_0)$ ---
  $<\alpha$ reject H_0
  $>\alpha$ accept H_0

✡ as possible as close to $\dfrac{\alpha}{2}$

hypothesis test
1. null hypothesis: we assume to be correct, unless proved oth...
2. critical region: The range of values of test statistics
   that would lead to rejecting H_0.
   Critical value: The boundary of cR.
-ex: $H_0: P=0.3$ $H_1: P>0.3$
   $X \sim$
   $P(X \geqslant 8) = 0.4567 < 0.05 (\alpha)$
   CR. $X \geqslant 8$ ⑧

解释题

- In statistics, a population is the whole set of items that are of interest.

For example, the population could be the items manufactured by a factory or all the people in a town. Information can be obtained from a population. This is known as raw data.

- A **census** observes or measures every member of a population.

- A sample is a selection of observations taken from a subset of the population which is used to find out information about the population as a whole.

There are a number of advantages and disadvantages of both a census and a sample.

	Advantages	Disadvantages
Census	• It should give a completely accurate result quicker & easier	• Time-consuming and expensive • Cannot be used when the testing process destroys the item • Hard to process a large quantity of data
Sample	• Less time-consuming and expensive than a census • Fewer people needed to respond • Less data to process than in a census	• The data may not be as accurate • The sample may not be large enough to give information about small sub-groups of the population

The size of a sample can affect the validity of any conclusions drawn.
- The size of the sample depends on the required accuracy and available resources.
- Generally, the larger the sample, the more accurate it is, but you will need greater resources.
- If the population is very varied, you need a larger sample than if the population were uniform.
- Different samples can lead to different conclusions due to the natural variation in a population.

- Individual units of a population are known as **sampling units**.

- Often, sampling units of a population are individually named or numbered to form a list called a **sampling frame**.

sampling unit 抽样单位: 个体 a…

sampling frame 样本框架: list of all…

sampling distribution 概率分布: probability distribution of a statistic

population: collection of all items

statistic : a function of the sample which contains no unknown quantities

在所有工人里，选 100 个人，测骑车上班的人的概率

↓   ↓

sampling frame   statistics
a list of all workers ⟍ number of people that ride to work
sampling units
    a cook   a list of all sampling units in the population
population
a collection all the workers

a random sample: every possible sample has an equal chance of being selected

sampling distribution: the probability distribution of the number of 骑车上班的人

When the population & sampling frame not the same
not always possible to keep this list up to date