

# Computer Seminar Homework 1st

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## 1 Chapter 1

Our research office is mainly on the reliability of systems and software It's mainly based on probability theory to model and evaluate reliability through analysis.

The following probability process is used specifically:

- NHPP
- CTMC

## 2 Chapter 2

We usually use LATEX to make thesis or articles. LATEX is a language that contains mathematical formulas. It can make the article neat and beautiful

## 3 Chapter 3

When the probability variable  $X$  follows the exponential distribution, the distribution function  $F_X(t)$  and the density function  $f_X(t)$ .

$$F_X(t) = 1 - e^{-\lambda t} \quad (1)$$

$$f_X(t) = \lambda e^{-\lambda t} \quad (2)$$

In addition, according to the definition

$$\begin{aligned}
 E[X] &= \int_0^{\infty} t f_x(t) dt \\
 &= [(1 - e^{-\lambda t})t]_0^{\infty} - \int_0^{\infty} (1 - e^{-\lambda t}) dt \\
 &= [(1 - e^{-\lambda t})t]_0^{\infty} - [t + \frac{1}{\lambda} e^{-\lambda t}]_0^{\infty} \\
 &= \frac{1}{\lambda}
 \end{aligned} \tag{3}$$

This equation is the expected value of distribution.

## 4 Chapter 4

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