도수분포에서의 평균, 분산, 표준편차 (Mean, Variance, Standard Deviation of Frequency Distribution)





x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

$$f_1+f_2+f_3+\cdots+f_n$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

$$\begin{array}{c|c} x_i f_i \\ \hline x_1 f_1 \\ \vdots \\ x_n f_n \end{array} \qquad f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
		:
:		
x_n	f_n	$x_n f_n$

$$\begin{array}{c|c} \underline{x_if_i} \\ \hline x_1f_1 \\ \vdots \\ x_nf_n \end{array}$$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

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x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

$$\left[rac{f_1}{f_1}
ight] \qquad f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean

▶ Start ▶ End

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

Mean : m

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
	•	•
x_n	f_n	$x_n f_n$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\displaystyle\sum_{i=1}^{n} x_i f_i}{\displaystyle\sum_{i=1}^{n} f_i}$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
		•
x_n	f_n	$x_n f_n$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N}$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
•		
x_n	\int_{n}	$x_n f_n$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

▶ Start ▶ End

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance

▶ Start ▶ End

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
•	:	:
x_n	f_n	$x_n f_n$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance : σ^2

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	
	•	•
x_n	f_n	$x_n f_n$

$$f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\displaystyle\sum_{i=1}^n (x_i - m)^2 f_i}{\displaystyle\sum_{i=1}^n f_i}$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
		•
x_n	f_n	$x_n f_n$

$$f_1 = f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - m)^2 f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} (x_i - m)^2 f_i$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	
	•	•
x_n	f_n	$x_n f_n$

$$f_1 = f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - m)^2 f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} (x_i - m)^2 f_i = \frac{1}{N} \sum_{i=1}^{n} x_i^2 f_i$$

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
	•	•
x_n	f_n	$x_n f_n$

$$\frac{f_i}{f_1}$$
 $f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - m)^2 f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} (x_i - m)^2 f_i = \frac{1}{N} \sum_{i=1}^{n} x_i^2 f_i - m^2$$

▶ Start ▶ End

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	
x_n	f_n	$x_n f_n$

$$\left[egin{array}{c} f_1 \ \hline f_1 \ \hline f_2 + f_3 + \cdots + f_n = \sum_{i=1}^n f_i = N \end{array}
ight]$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - m)^2 f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} (x_i - m)^2 f_i = \frac{1}{N} \sum_{i=1}^{n} x_i^2 f_i - m^2$$

Standard Deviation



▶ Start ▶ End

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f.	$x_n f_n$
$\sim n$	Jn	$\sim n_J n$

$$\left. rac{f_1}{f_1} \right| \qquad f_1 + f_2 + f_3 + \dots + f_n = \sum_{i=1}^n f_i = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - m)^2 f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} (x_i - m)^2 f_i = \frac{1}{N} \sum_{i=1}^{n} x_i^2 f_i - m^2$$

Standard Deviation : σ

▶ Start ▶ End

x_i	f_i	$x_i f_i$
x_1	f_1	x_1f_1
:	:	:
x_n	f_n	$x_n f_n$

$$\left| \begin{array}{c} f_{1} \\ f_{1} \\ f_{n} \end{array} \right| \qquad f_{1} + f_{2} + f_{3} + \dots + f_{n} = \sum_{i=1}^{n} f_{i} = N$$

Mean :
$$m = \frac{\sum_{i=1}^{n} x_i f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} x_i f_i$$

Variance :
$$\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - m)^2 f_i}{\sum_{i=1}^{n} f_i} = \frac{1}{N} \sum_{i=1}^{n} (x_i - m)^2 f_i = \frac{1}{N} \sum_{i=1}^{n} x_i^2 f_i - m^2$$

Standard Deviation : $\sigma = \sqrt{\sigma^2}$



Github:

https://min7014.github.io/math20230520001.html

Click or paste URL into the URL search bar, and you can see a picture moving.