Calculating Variance of Continuous Frequency Distribution
Data Science and A.I. Lecture Series

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PostNetwork Academy

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Find the of variance continuous frequency distribution.

Here

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Class Interval	f_i					
20-30	3					
30-40	6					
40-50	13					
50-60	15					
60-70	14					
70-80	5					
80-90	4					
	$N = \sum f_i = 60$					

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Class Interval	f_i	MidValues(x_i)	$u_i = \frac{x_i - A}{h}$	$f_i u_i$	u_i^2	$f_i u_i^2$
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60-70	14	65	1	-14	1	14
70-80	5	75	2	10	4	20
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50-60	15	55	0	0	0	0
60-70	14	65	1	-14	1	14
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80-90	4	75	3	12	9	36
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60-70	14	65	1	-14	1	14
70-80	5	75	2	10	4	20
80-90	4	75	3	12	9	36
	$N = \sum f_i = 60$			$\sum f_i u_i = 2$		$\sum f_i u_i^2 = 134$

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50-60	15	55	0	0	0	0
60-70	14	65	1	-14	1	14
70-80	5	75	2	10	4	20
80-90	4	75	3	12	9	36
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70-80	5	75	2	10	4	20
80-90	4	75	3	12	9	36
	$N = \sum f_i = 60$			$\sum f_i u_i = 2$		$\sum f_i u_i^2 = 134$

Here

A=55 and h=10

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Here $\sum f_i u_i = 2$

Find the of variance continuous frequency distribution.

Class Interval	f_i	MidValues(x_i)	$u_i = \frac{x_i - A}{h}$	$f_i u_i$	$u_i{}^2$	$f_i u_i{}^2$
20-30	3	25	-3	-9	9	27
30-40	6	35	-2	-12	4	24
40-50	13	45	-1	-13	1	13
50-60	15	55	0	0	0	0
60-70	14	65	1	-14	1	14
70-80	5	75	2	10	4	20
80-90	4	75	3	12	9	36
	$N = \sum f_i = 60$			$\sum f_i u_i = 2$		$\sum f_i u_i{}^2 = 134$

Here

A=55 and h=10

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30-40	6	35	-2	-12	4	24
40-50	13	45	-1	-13	1	13
50-60	15	55	0	0	0	0
60-70	14	65	1	-14	1	14
70-80	5	75	2	10	4	20
80-90	4	75	3	12	9	36
	$N = \sum f_i = 60$			$\sum f_i u_i = 2$		$\sum f_i u_i{}^2 = 134$

Here

A=55 and h=10

———

Here $\sum f_i u_i = 2$ and $\sum f_i u_i{}^2 = 134$

Variance formula is $Var(X) = h^2 \left(\left(\frac{1}{N} \sum_{i=1}^{n} f_i u_i^2 \right) - \left(\frac{1}{N} \sum_{i=1}^{n} f_i u_i \right)^2 \right)$

Find the of variance continuous frequency distribution.

Class Interval	f_i	MidValues(x_i)	$u_i = \frac{x_i - A}{h}$	$f_i u_i$	u_i^2	$f_i u_i^2$
20-30	3	25	-3	-9	9	27
30-40	6	35	-2	-12	4	24
40-50	13	45	-1	-13	1	13
50-60	15	55	0	0	0	0
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Here

A=55 and h=10

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Here $\sum f_i u_i = 2$ and $\sum f_i u_i^2 = 134$

Variance formula is $Var(X) = h^2((\frac{1}{N} \sum_{i=1}^{n} f_i u_i^2) - (\frac{1}{N} \sum_{i=1}^{n} f_i u_i)^2)$

Plugin all values we will have Var(X)=$100[\frac{134}{60} - (\frac{2}{60})^2]$ = 222.90