Formulas

Date _____

- Commulative frequency : Sum of freq of all Preceding f + freque-
- Class mark : mid of Interval : L.L + U.L/2
- Relative frequency : $f/\Sigma f$.
- Angle : R.f x 360°
- Percentage (%) : R.f x 100
- Width : $UL_n - UL_{n+1}$, $LL_n - LL_{n+1}$
- Class boundry : LL - 0.5 — UP.L + 0.5

Operation	Grouped data	Ungrouped data
Mean	$\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$	$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$
Median	$l + \frac{h}{f}\left(\frac{n}{2} - c\right)$	$a = (n/2)^{th}$, $b = \frac{(n+2)^{th}}{2}$, $= \frac{a+b}{2}$ ← for even data; $(n+1)/2^{th}$ ← for Odd data.
Mode	$d + h * \frac{f_m - f_1}{(f_m - f_1) + (f_m - f_2)}$	most repeated number
Model Class	highest frequency wali row	
Median class	$\Sigma f/2 = n$	

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Operation	Grouped	Ungrouped.
③ Quartiles	$Q_i = l + \frac{h}{f}\left(\frac{in}{4} - c\right)$	$Q_i = \left(\frac{i(n+1)}{4}\right)^{th}$, $i = 1, 2, 3$
④ Decile	$D_i = l + \frac{h}{f}\left(\frac{in}{10} - c\right)$	$D_i = \left(\frac{i(n+1)}{10}\right)^{th}$, $i = 1, 2, \ldots 10$
⑤ Percentile	$P_i = l + \frac{h}{f}\left(\frac{in}{100} - c\right)$	$P_i = \left(\frac{i(n+1)}{100}\right)^{th}$, $i = 1$-100.
⑥ Range	$x_{max} - x_{min}$	
⑦ Mean Deviation		$\frac{\sum(x_i - \bar{x})}{n}$ $\because \bar{x} = \frac{\sum x_i}{n}$
⑧ Variance	$\because$ Popⁿ: $\sigma^2 = \frac{\sum(x_i - \mu)^2}{N}$ $\because \mu \rightarrow$ Popⁿ mean	$\because$ Sample $s^2 = \frac{\sum(x_i - \bar{x})^2}{n-1}$
⑨ Standard deviation	$St = \sqrt{\sigma^2}$	$\Rightarrow \sqrt{\frac{\sum(x_i - \mu)^2}{N}}$ Population; $s = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n-1}}$ Sample

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⊙ Interquartile Range (IQR)	$Q_3 - Q_1 = IQR$
⊙ Coefficient of Variation	$CV = \frac{S.D}{mean}$ or $\frac{SD}{median}$
⊙ Variance	$s^2 = \frac{\sum x_i^2 - (\sum x_i)^2/n}{n-1}$
⊙ five number Summary & Box Plot	min, Q_1, Q_2, Q_3, max
⊙ Adjacent Values.	lower limit of Data : $Q_1 - 1.5(IQR)$
	Upper limit of Data : $Q_3 + 1.5(IQR)$