

# Chapter 2: Descriptive Statistics

Non-Grouped Data 2.2 & 2.3		Grouped Data 2.2 & 2.3
<b>Sample Mean:</b>	<b>Population Mean:</b>	<b>Class Width:</b>
$\bar{x} = \frac{\sum x}{n}$ =AVGERAGE(DATA)	$\mu = \frac{\sum x}{N}$ =AVGERAGE(DATA)	$= \frac{\text{Range of Data}}{\text{Number of Classes}}$
<b>Sample Standard Deviation:</b>	<b>Population Standard Deviation:</b>	<b>Relative Frequency:</b>
$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$ =STDEV.S(DATA)	$\sigma = \sqrt{\frac{\sum(x - \mu)^2}{N}}$ =STDEV.P(DATA)	$= \frac{\text{Class frequency}}{\text{Total of Frequency}}$ Round up Rule ↑
<b>Sample Variance:</b>	<b>Population Variance:</b>	<b>Midpoint of Class:</b>
$s^2 = \frac{\sum(x - \bar{x})^2}{n - 1}$ =VAR.S(DATA)	$\sigma^2 = \frac{\sum(x - \mu)^2}{N}$ =VAR.P(DATA)	$= \frac{(\text{Lower Class Limit} + \text{Upper Class Limit})}{2}$

## Grouped Data (Frequency Distribution Table) 2.3

<b>Frequency of Sample Mean:</b>	$\bar{x} = \frac{\sum xf}{\sum f}$	<b>Frequency of Population Mean:</b>	$\mu = \frac{\sum xf}{\sum f}$
<b>Sample Standard Deviation:</b>	$s = \sqrt{\frac{\sum(x - \bar{x})^2 f}{(\sum f) - 1}}$	<b>Population Standard Deviation:</b>	$\sigma = \sqrt{\frac{\sum(x - \mu)^2 f}{\sum f}}$
<b>Sample Variance:</b>	$s^2 = \frac{\sum(x - \bar{x})^2 f}{(\sum f) - 1}$	<b>Population Variance:</b>	$\sigma^2 = \frac{\sum(x - \mu)^2 f}{\sum f}$

## Measures of Variation 2.4

## Box & Plots 2.5

<b>Weighted Mean:</b>	$\bar{x}_w = \frac{\sum wx}{\sum w}$	<b>Range:</b>	= (Maximum data entry – Minimum data entry)
		<b>Quartiles:</b>	=QUARTILE.INC(HIGHLIGHT DATA,0)...,(1),2),3),4)
<b>Coefficient Variation:</b>	$CV \frac{s}{\bar{x}} \cdot 100\%$	<b>Interquartile Range (IQR):</b>	IQR = Q <sub>3</sub> – Q <sub>1</sub>

## Measures of Position 2.5

<b>Chebyshev's Inequality:</b>	$\left(1 - \frac{1}{k^2}\right) \times 100\%$	<b>Percentile of x</b>	<b>Lower Fence:</b>	= Q <sub>1</sub> – 1.5(IQR)
	<b>k = 2: 75% &amp; k = 3: 88.9%</b>	$= \frac{\# \text{ of data less than } x}{\text{sample size}} \cdot 100$ <b>Round up Rule ↑</b>	<b>Upper Fence:</b>	= Q <sub>3</sub> + 1.5(IQR)
<b>Sample Z – Score:</b>	$z = \frac{x - \bar{x}}{s}$ =STANDARDIZE(x, x̄, s)		<b>Population Z – Score:</b>	$z = \frac{x - \mu}{\sigma}$ =STANDARDIZE(x, μ, σ)

## NOTATIONS

<b>x</b> = Class Midpoint	<b>x̄</b> = Sample Mean	<b>Q<sub>0</sub></b> = Minimum ,0 in formula
<b>n</b> = Sample Size; Sum of frequency	<b>μ</b> = Population Mean	<b>Q<sub>1</sub></b> = Quartile 1 (25 <sup>th</sup> percentile) ,1 in formula
<b>N</b> = Population Size	<b>s</b> = Sample Standard Deviation	<b>Q<sub>2</sub></b> = Quartile 2/ Medium (50 <sup>th</sup> percentile) ,2 in formula
<b>f</b> = Frequency	<b>σ</b> = Population Standard Deviation	<b>Q<sub>3</sub></b> = Quartile 3 (75 <sup>th</sup> percentile) ,3 in formula
<b>w</b> = Weight (hours, units, pounds)	<b>s<sup>2</sup></b> = Sample Variance	<b>Q<sub>4</sub></b> = Maximum ,4 in formula
<b>k</b> = Number of Standard Deviation	<b>σ<sup>2</sup></b> = Population Variance	<b>Z</b> = z – score
<b>Σ</b> = Summation, Sum of	<b>Round Up Rule</b> = round up to nearest whole #	