MEASURES OF CENTRAL TENDENCY

MEAN

1) Given a set of numbers: 4, 2, 7, 6, 9

$$\bar{x} = \frac{\Sigma x}{n} = \frac{4+2+7+6+9}{5} = 5.6$$

2) Given a frequency distribution

x	f
2	3
5	2
4	1
9	4
$\Sigma f = 10$	

$$\bar{x} = \frac{2+2+2+5+5+4+9+9+9+9}{10}$$

$$\boxed{\bar{x} = \frac{\Sigma(f \cdot x)}{\Sigma f}} = \frac{3 \cdot 2 + 2 \cdot 5 + 1 \cdot 4 + 4 \cdot 9}{10}$$

$$= 5.6$$

3) Given a Grouped Distribution

	f	Midpoint = x
0-9	3	$\frac{0+9}{2} = 4.5$
10-19	2	14.5
20-29	1	24.5
30-39	4	34.5
$\Sigma f =$	10	

$$\bar{x} = \frac{\Sigma(x \cdot f)}{\Sigma f}$$

$$= \frac{4.5 \times 3 + 14.5 \times 2 + 24.5 + 34.5 \times 4}{10}$$

$$= 20.5$$

MEDIAN: the middle entry in a set of ordered (sorted) data

Ex: 5, 2, 7, 4, 9 Median = ?

2, 4, 5, 7, 9 $n = 5$

x_1 x_2 ↑ x_4 x_5

Median x_3

Location of the median $= L = \frac{n+1}{2} = \frac{5+1}{2} = 3$

Median $= x_3 = 5$

Example: 5, 2, 7, 4, 9, 6 $n = 6$

2, 4, 5, 6, 7, 9

Location $= L = \frac{n+1}{2} = \frac{6+1}{2} = \frac{7}{2} = 3.5$

Median $= \frac{x_3 + x_4}{2} = \frac{5+6}{2} = 5.5$

MODE: the most frequent observation

Ex: 5, 5, 1, 4, 7, 6 Mode = 5

Ex: 5, 5, 1, 4, 7, 7, 6 Modes: 5 & 7

Ex: 5, 1, 4, 7 6 No Mode

Ex: 5, 1, 1, 4, 4, 4, 7, 7, 6 Mode = 4