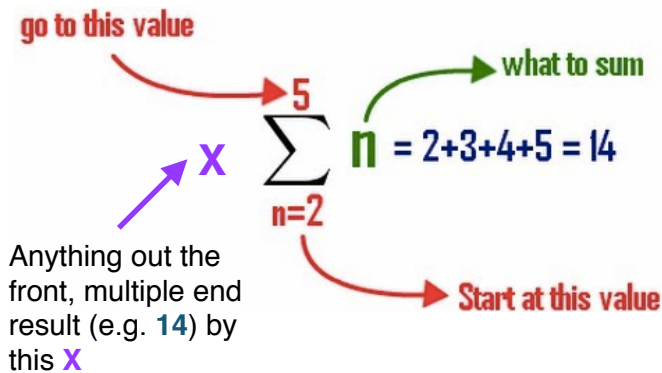


**QUANTITATIVE  
METHODS 1  
ECON10005**

# Statistics

- **Summation notation**



- **Sample:** *part of a population* used for statistical calculation
- **Mean:** a number of observations ( $n$ ). Add all observations and divide by  $n$

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} = \frac{1}{n} \sum_{i=1}^n x_i$$

- **Mode: the most common value**
  - *Multiple* modes can exist
  - There can be *no mode*
- **Median:** middle cut of observations
  - The middle value if  $n$  is *odd*
  - The mean of the two middle values if  $n$  is *even*
  - *Order statistics:* taking observations and putting them in order (necessary to calculate the median)

$$\begin{array}{l} \text{If } n \text{ is odd:} \quad \text{median} = x_{(\frac{n+1}{2})} \\ \text{If } n \text{ is even:} \quad \text{median} = \frac{x_{(\frac{n}{2})} + x_{(\frac{n}{2} + 1)}}{2} \end{array}$$

- Brackets around subscripts denotes that they have been ordered
- **Range: Maximum - Minimum**
- **Percentiles:**  $p\%$  of the observations are less than or equal to the  $p$ 'th percentile
  - Median is the 50th percentile (*second quartile*)
  - 25% is the *first quartile*
  - 75% is the *third quartile*
- **Interquartile range (IQR) = Third Quartile - First quartile**
  - How spread out the observations are around the median