📊 Fundamental of Statistics with Microsoft Excel Notes

Event: Fundamental of Statistics with Microsoft Excel by Data Analytics Philippines (FB Page - Live)

Lecturer: Engr. Raniel B. Taripe, CIE MBA-FM

Note taker: RavenKlein T. Rubin (Project Raven)

Format: ChatGPT

🔢 Types of Data

- **Ratio Data**
  ✅ Has a *true zero* (can be zero)
  ➤ Example: Height, Weight, Age, Income
  ➤ 0 means “none” (e.g., 0 kg = no weight)

- **Interval Data**
  ✅ Has values even if 0
  ➤ Example: Temperature (0°C is still a temperature)
  ➤ No true zero (0 ≠ nothing)

📍 Measures of Central Tendency

- **Mean (Average)**
  ➤ Add all values, divide by number of values
  🧮 Excel: `=AVERAGE(A1:A10)`

- **Median (Middle Value)**
  ➤ Middle number when data is sorted
  ➤ If even count: average of two middle numbers
  🧮 Excel: `=MEDIAN(A1:A10)`

- **Mode (Most Frequent Value)**
  ➤ Value that appears the most
  ➤ Useful for *categorical (nominal)* data
  🧮 Excel: `=MODE.SNGL(A1:A10)`

- **Midrange**
  ➤ (Highest + Lowest) ÷ 2
  🧮 Excel: `=(MAX(A1:A10)+MIN(A1:A10))/2`

📊 Measures of Spread or Dispersion

- **Range**
  ➤ Highest - Lowest
  🧮 Excel: `=MAX(A1:A10)-MIN(A1:A10)`

- **Average Deviation**
  ➤ Average distance from the mean
  🧮 Excel: `=AVEDEV(A1:A10)`

- **Standard Deviation**
  ➤ Shows how much values vary from the average
  🧮 Excel: `=STDEV.S(A1:A10)`

📦 Quartiles and Percentiles

- **Quartiles (Split into 4 parts)**
  ➤ Q1 = 25%, Q2 = 50% (Median), Q3 = 75%
  🧮 Excel: `=QUARTILE.EXC(A1:A10,1)` (Q1)

- **Percentiles (Split into 100 parts)**
  ➤ 25th percentile = more than 25% of data
  🧮 Excel: `=PERCENTILE.EXC(A1:A10,0.25)` (25%)

📈 Additional Statistical Tools

- **Interquartile Range (IQR)**
  ➤ IQR = Q3 - Q1
  🧮 Excel: `=QUARTILE.EXC(A1:A10,3) - QUARTILE.EXC(A1:A10,1)`

- **Midhinge**
  ➤ (Q1 + Q3) ÷ 2
  🧮 Excel: `=AVERAGE(QUARTILE.EXC(A1:A10,1),QUARTILE.EXC(A1:A10,3))`

- **Quartile Deviation**
  ➤ (Q3 - Q1) ÷ 2
  🧮 Excel: `=(QUARTILE.EXC(A1:A10,3)-QUARTILE.EXC(A1:A10,1))/2`

- **Coefficient of Variation (CV)**
  ➤ Standard deviation ÷ mean × 100
  🧮 Excel: `=STDEV.S(A1:A10)/AVERAGE(A1:A10)*100`

📐 Skewness and Kurtosis

- **Skewness**
  ➤ Measures if data leans left or right
  🧮 Excel: `=SKEW(A1:A10)`

- **Kurtosis**
  ➤ Measures the "peakedness" of data
  🧮 Excel: `=KURT(A1:A10)`

⚠️ Outliers

- Outliers = values far from the rest

- Not always removed (depends on context)
  ➤ Example: Sudden stock market spike

📊 Box Plot

- Like a candlestick chart (used in stock market)
- Shows min, Q1, median, Q3, max
- Helps identify outliers and spread