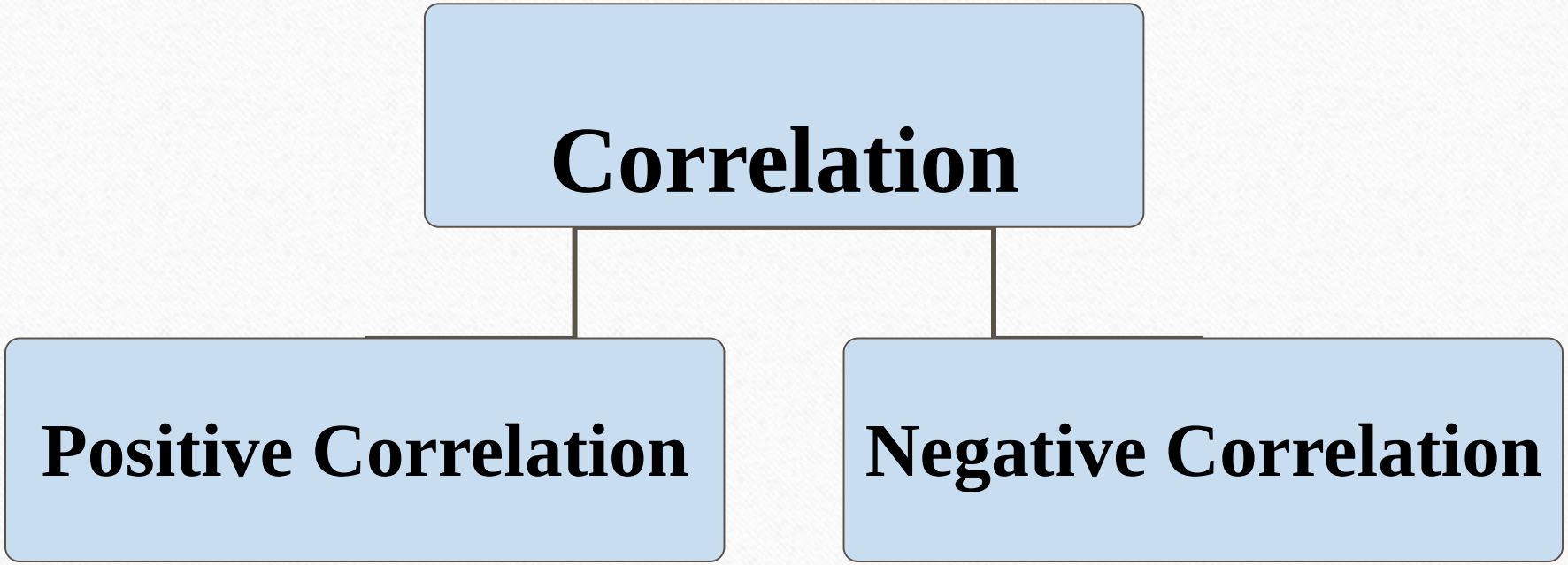
# Correlation Analysis

## Types of Correlation

# Types of Correlation - Type I

Based on Direction of Movement



# Types of Correlation Type I

- **Positive Correlation:** The correlation is said to be positive, if the values of two variables changing in same direction.

  Example: Public Expenditure & sales, Height & weight.

- **Negative Correlation:** The correlation is said to be negative correlation when the values of variables change with opposite direction.

- Example: Price & qty. demanded.

# Direction of the Correlation

Indicated by sign; (+) or (-).

- **Positive relationship** – Variables change in the same direction.
  - As X is increasing, Y is increasing
  - As X is decreasing, Y is decreasing

  **Example**: As height increases, so does weight.
- **Negative relationship** – Variables change in opposite directions.
  - As X is increasing, Y is decreasing
  - As X is decreasing, Y is increasing
  - **Example**: As TV time increases, grades decrease

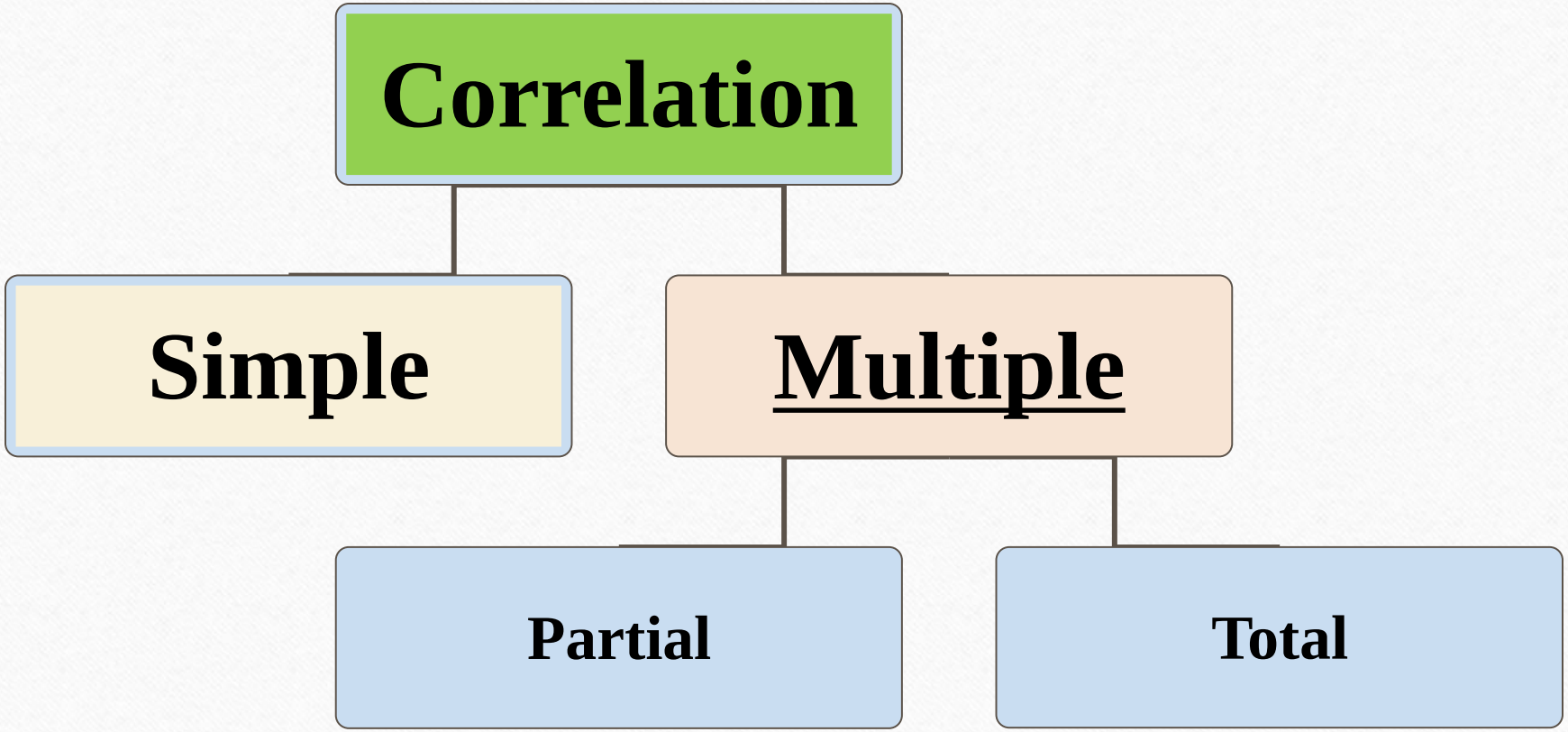
# More examples

- **Positive relationships**
- water consumption and temperature.
- study time and grades.

- **Negative relationships:**
- alcohol consumption and driving ability.
- Price & quantity demanded

# Types of Correlation - Type II

## Based on Number of Variables

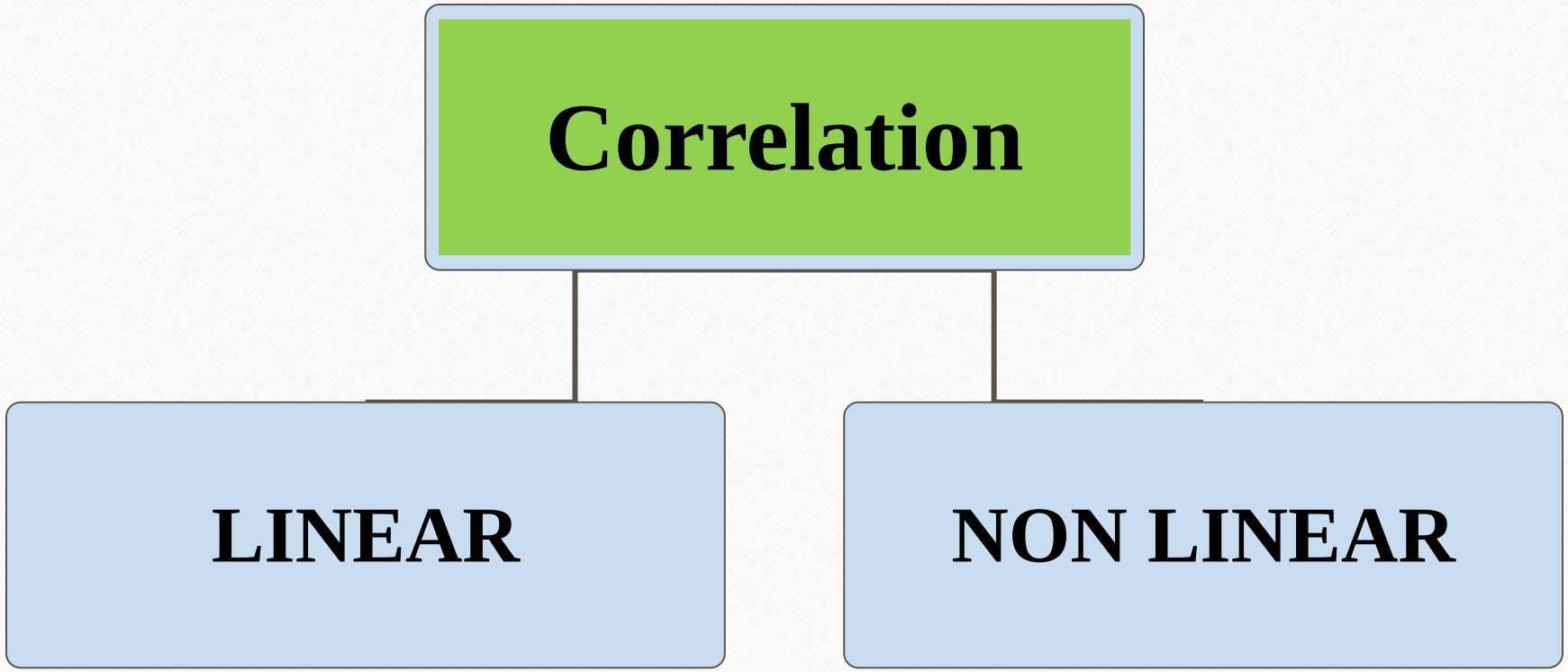


# Types of Correlation Type II

- **Simple correlation:** Under simple correlation problem there are only two variables are studied.
- **Multiple Correlation:** Under Multiple Correlation three or more than three variables are studied. Ex. $Q_d = f\ (P, P_C, P_S, t, y)$
- **Partial correlation:** analysis recognizes more than two variables but considers only two variables keeping the other constant.
- **Total correlation:** is based on all the relevant variables, which is normally not feasible.

# Types of Correlation - Type III

## Based on Kind of Relationship



# Types of Correlation Type III

- **Linear correlation:** Correlation is said to be linear when the amount of change in one variable tends to bear a consistent change in the other variable. The graph of the variables having a linear relationship will form a straight line.

  Ex X = 1, 2, 3, 4, 5, 6, 7, 8,

  Y = 5, 7, 9, 11, 13, 15, 17, 19,

  Y = 3 + 2x

For each unit change in one variable, there is consistent change in another variable.

- **Non Linear correlation:** The correlation would be non linear if the amount of change in one variable does not bear a constant ratio to the amount of change in the other variable.