



Summer of Code

Artificial Intelligence

(Machine Learning & Deep Learning)

Instructor

Wajahat Ullah

- *Research Assistant* (DIP Lab)

Duration

03 Months

(September – November)

[illegible]

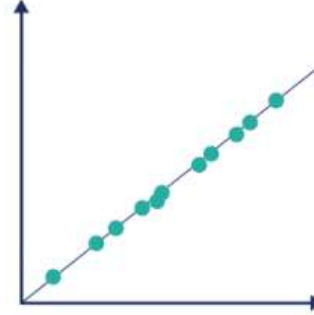
- ❖ What is Correlation?
- ❖ Correlation Coefficient
- ❖ Univariate, Bivariate, and Multivariate Plots

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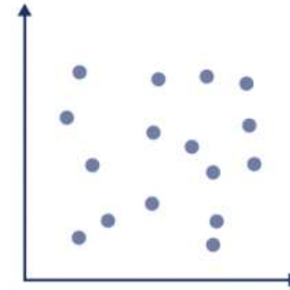
Correlation

- A statistical measure that describes the strength and direction of the relationship between two variables, showing how they tend to change together.
- It's quantified by a correlation coefficient.
- Correlation may be positive, zero, or negative.

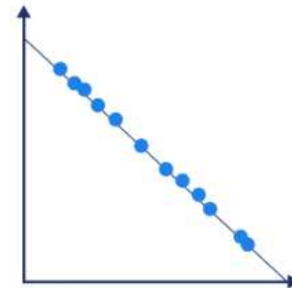
Perfect positive correlation



Zero correlation

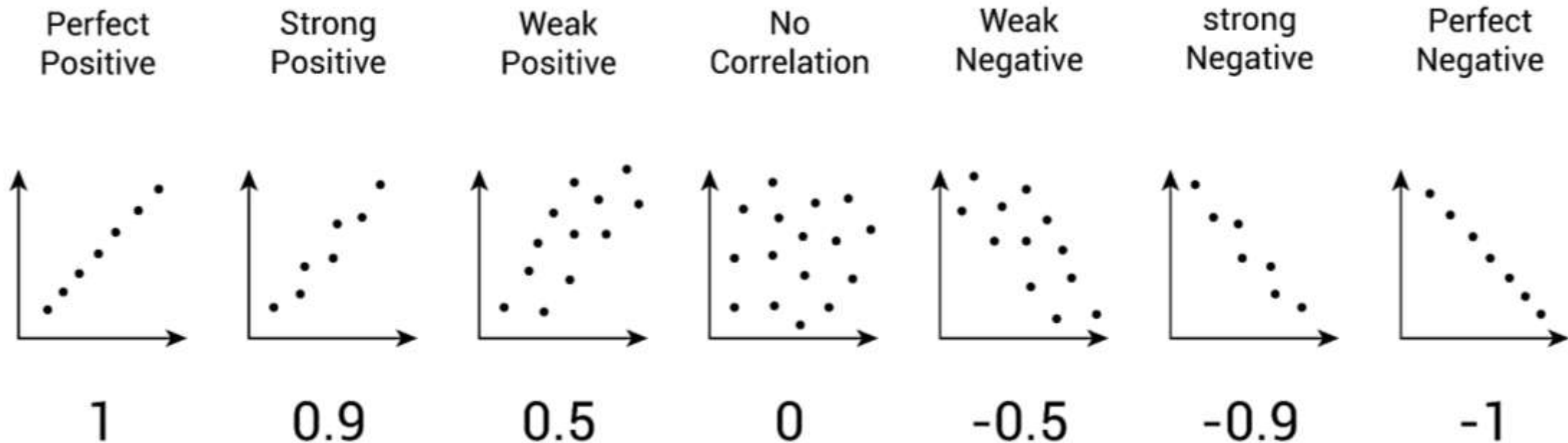


Perfect negative correlation



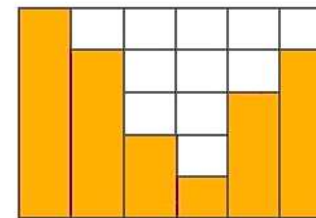
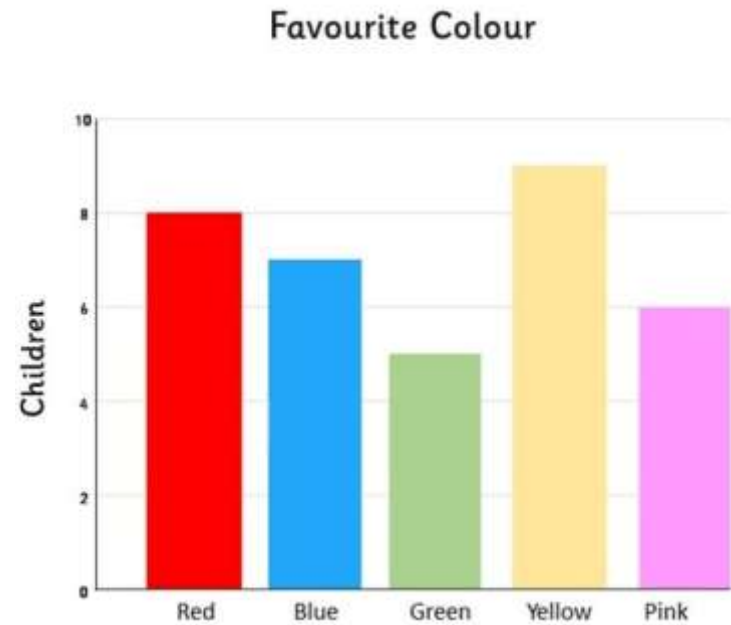
Correlation Coefficient

A correlation coefficient is a number between -1 and 1 that tells you the strength and direction of a relationship between variables.

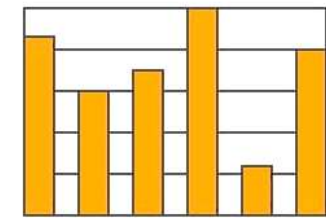


Univariate Data

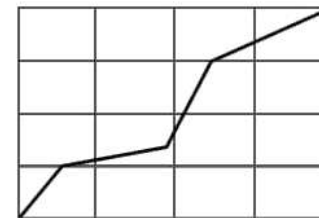
- It consists of observations for a single characteristic or variable, used to describe and summarize its distribution, central tendency, and variability.
- Data can be displayed using frequency polygon, histograms, stem and leaf plots, box and whisker plots, or pie charts.



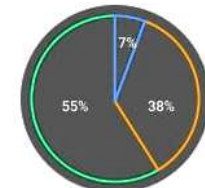
Histogram



Bar Chart



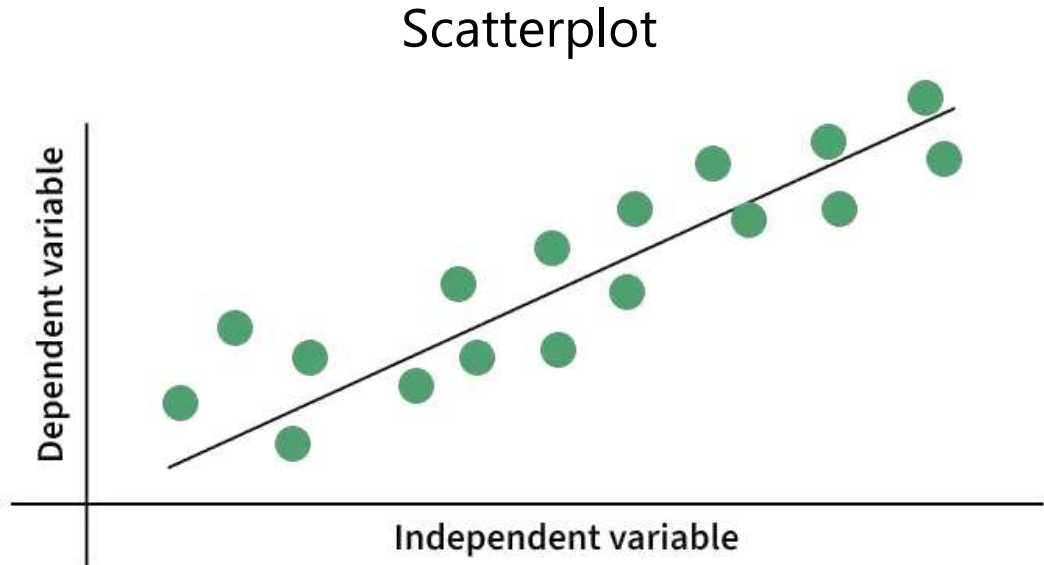
Frequency polygon



Pie Chart

Bivariate Data

- It consists of two variables where each data point has a value for both, used to analyze the relationship between them.
- Often analyzed using a scatterplot, where one variable is plotted on the x-axis and the other on the y-axis.
- Each data point represents two pieces of information.



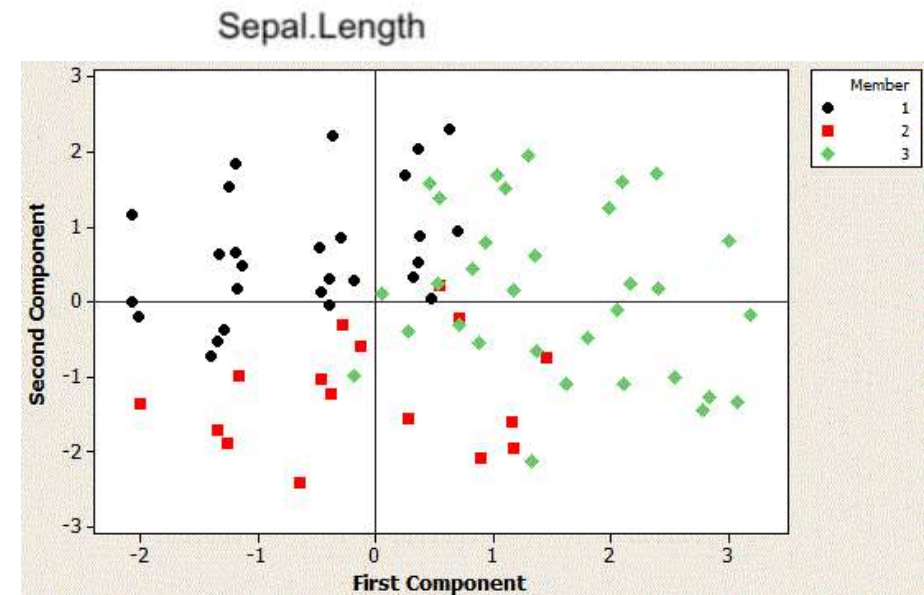
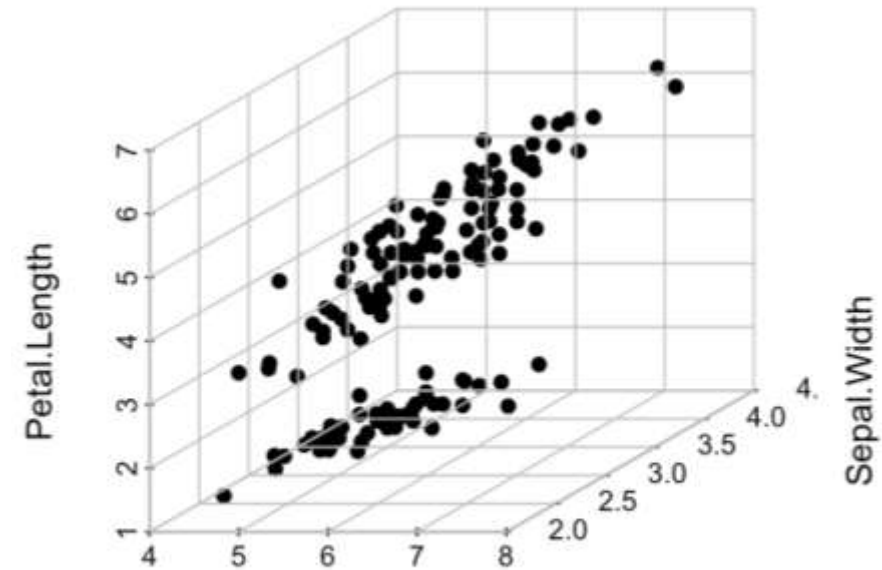
Years of Schooling	Annual Income
12	\$36,000
11	\$32,000
16	\$58,000
16	\$65,000
16	\$76,000
18	\$89,000
17	\$45,000
20	\$84,000
17	\$125,000
...	...

Multivariate Data

- It consists of observations for two or more variables for each unit in a dataset, such as a person's age, weight, and blood pressure.

Household ID	Household Size	Annual Income	Number of Pets
1	2	\$37,000	0
2	4	\$49,000	0
3	4	\$58,000	1
4	1	\$68,000	3
5	3	\$61,000	2
6	5	\$64,000	2
7	6	\$79,000	1
8	4	\$89,000	1
9	7	\$104,000	1
10	2	\$95,000	0

Scatterplot



Thank You

