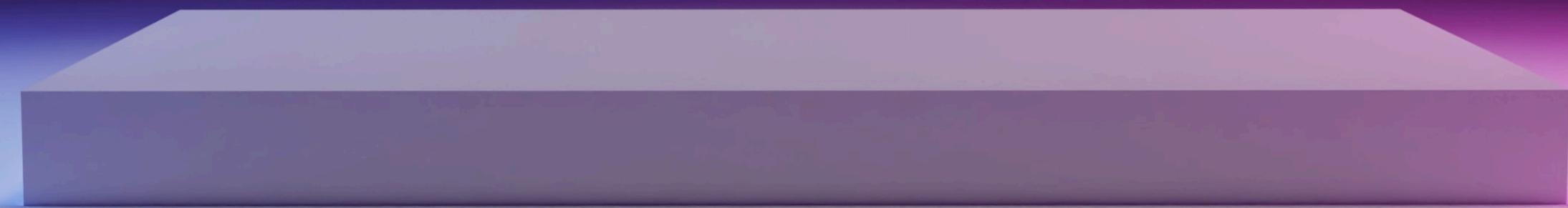


# ML SIG

## DAY -1



# WHAT IS ML?



# WHY ML?

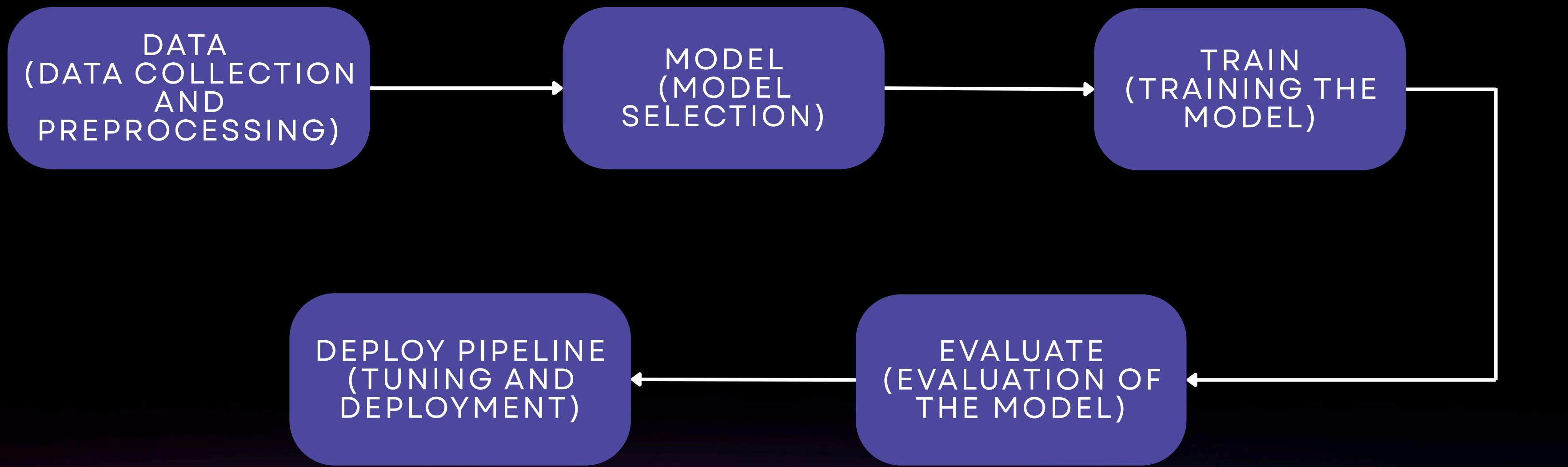


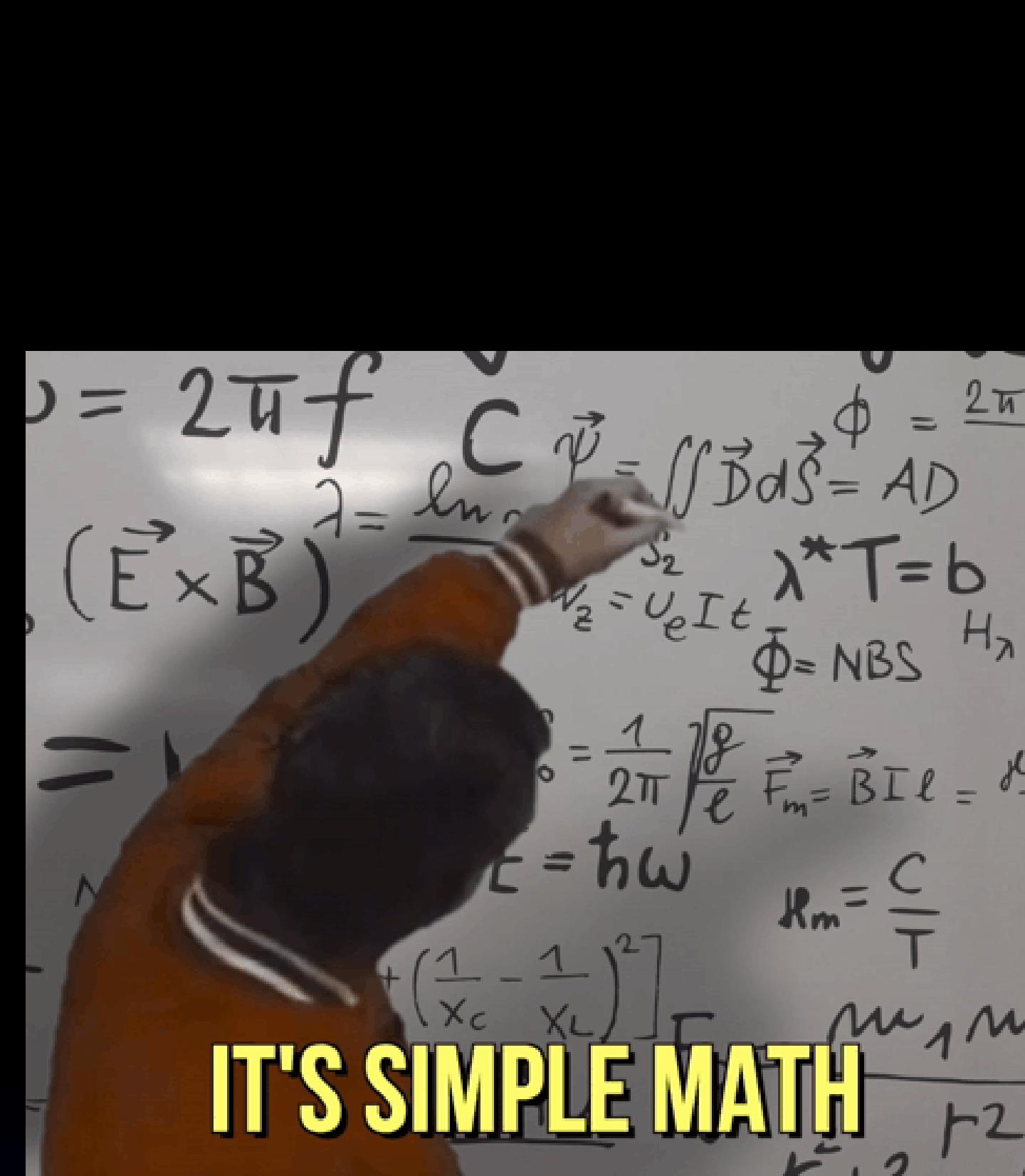
# TRADITIONAL VS ML

FEATURE	TRADITIONAL PROGRAMMING	MACHINE LEARNING
INPUT	Rules + Data	Data + Labels
OUTPUT	Output	Models/Predictions
USED FOR	Simple, deterministic tasks (e.g., calculators, billing)	Complex, pattern-based tasks (e.g., image recognition, translation)
EXAMPLE	Writing if-else conditions to detect spam	Learning from thousands of emails to classify spam vs non-spam



# ML WORKFLOW





**IT'S SIMPLE MATH**

# WHAT IS A “MODEL”?



# LINEAR REGRESSION

A SUPERVISED LEARNING METHOD THAT MODELS THE RELATIONSHIP BETWEEN ONE OR MORE INPUT FEATURES  $X$  AND A CONTINUOUS OUTPUT  $Y$  BY FITTING A STRAIGHT LINE (OR HYPERPLANE).

FOR NOW JUST SEE IT AS,  
YOU WANNA FIND THE BEST SLOPE AND INTERCEPT FOR YOUR LINE

LINEAR REGRESSION

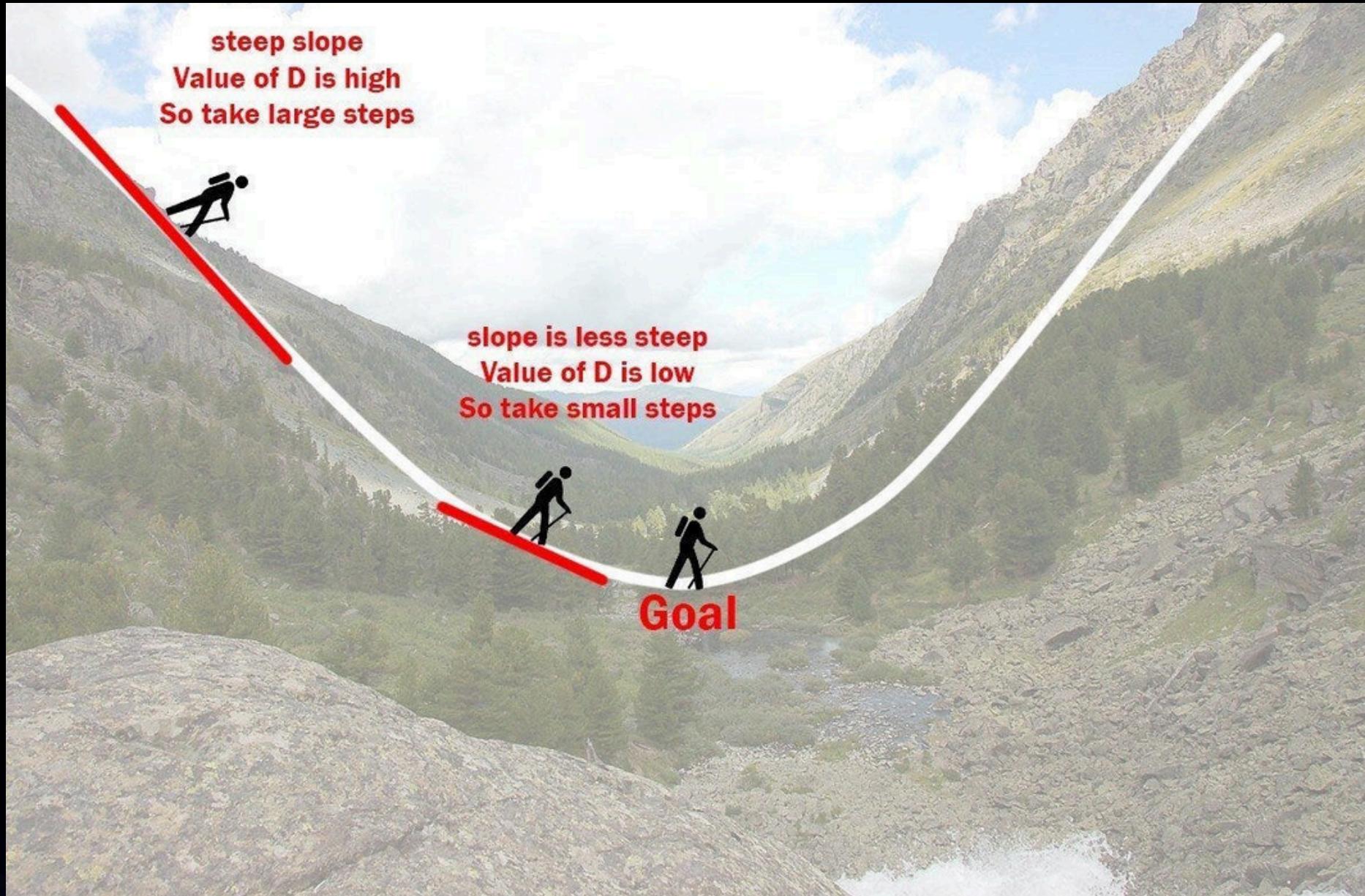


# LOSS AND COST FUNCTIONS

TERM	MEANING	EXAMPLE
ERROR	The difference between the predicted value and the actual value	$\text{Error} = \text{y\_pred} - \text{y\_true}$
LOSS	A numeric value representing how wrong a prediction is for one data point	E.g., Squared Error: $(\text{y\_pred} - \text{y\_true})^2$
COST	The average loss over the entire training dataset. Used to update model parameters.	$\text{Cost} = \text{Mean of all Losses}$



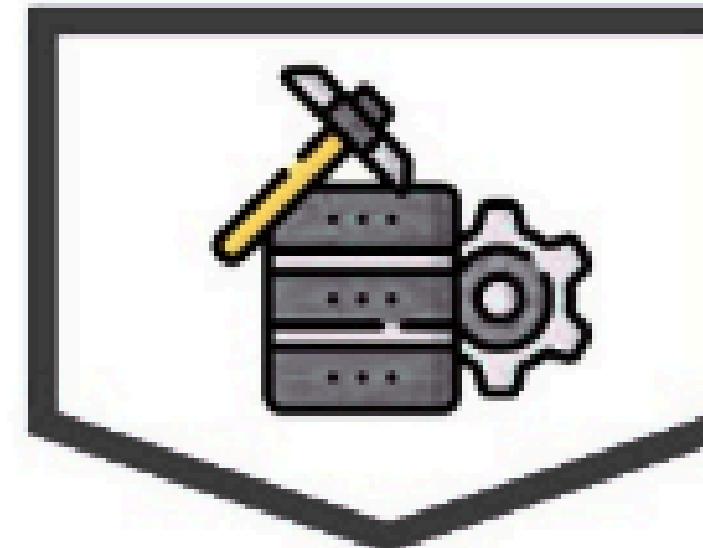
# GRADIENT DESCENT



GRADIENT DESCENT

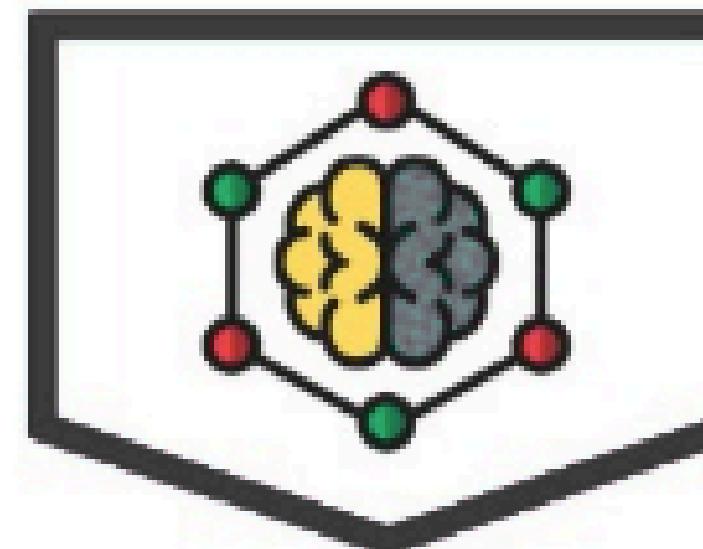


# The Machine Learning Process



## Data Pre-Processing

- Import the data
- Clean the data
- Split into training & test sets



## Modelling

- Build the model
- Train the model
- Make predictions



## Evaluation

- Calculate performance metrics
- Make a verdict



# QUIZ?



# THANK YOU!