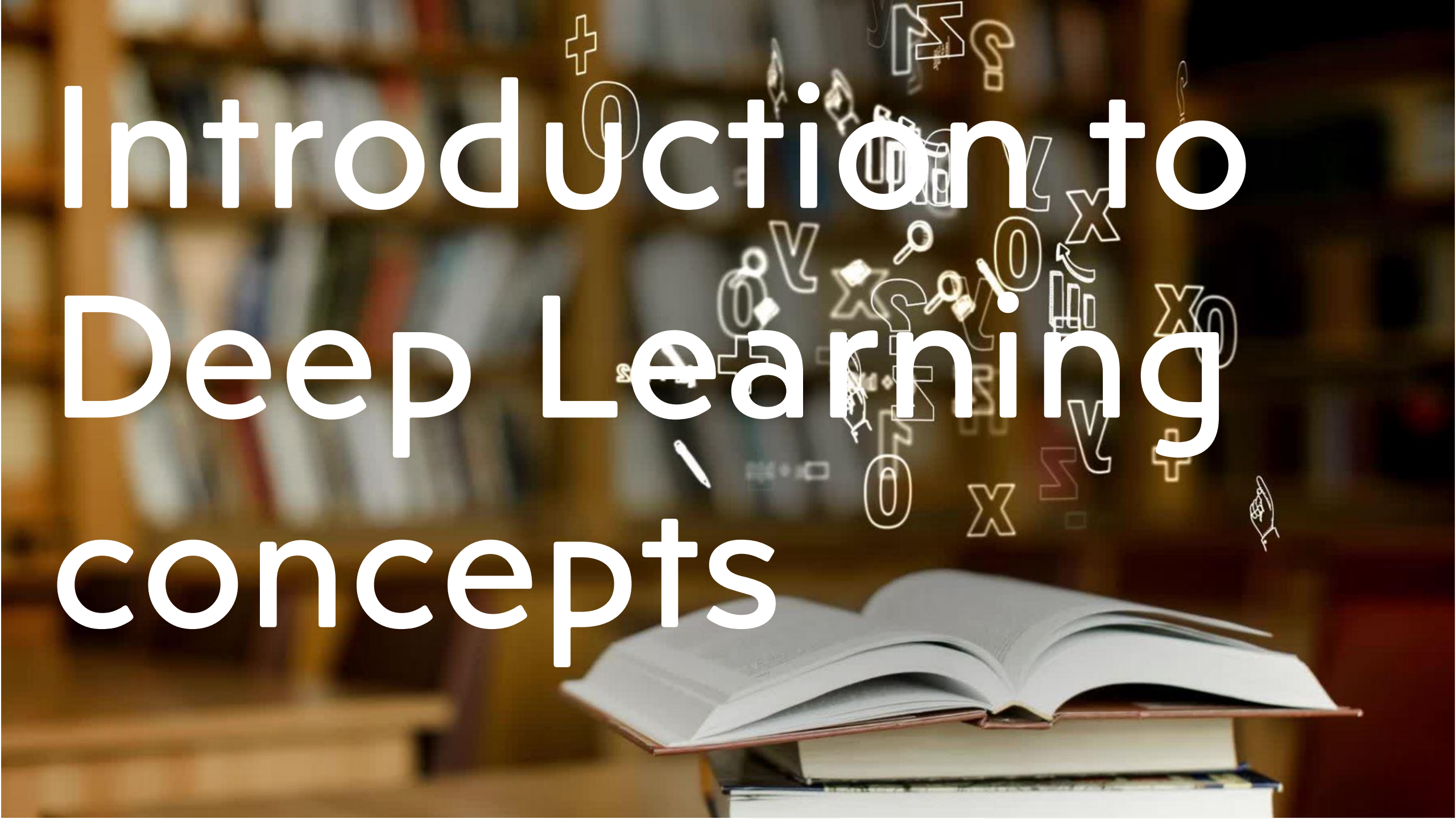
Deep Learning with Python

TODAY'S ROADMAP

- Introduction to Deep Learning Concepts
- Basics of Neural Networks
- From Linear to Logistic Regression
- Deep Neural Networks Insights
- Convolutional Neural Networks (CNNs)
- Wrap-Up and Q&A Session

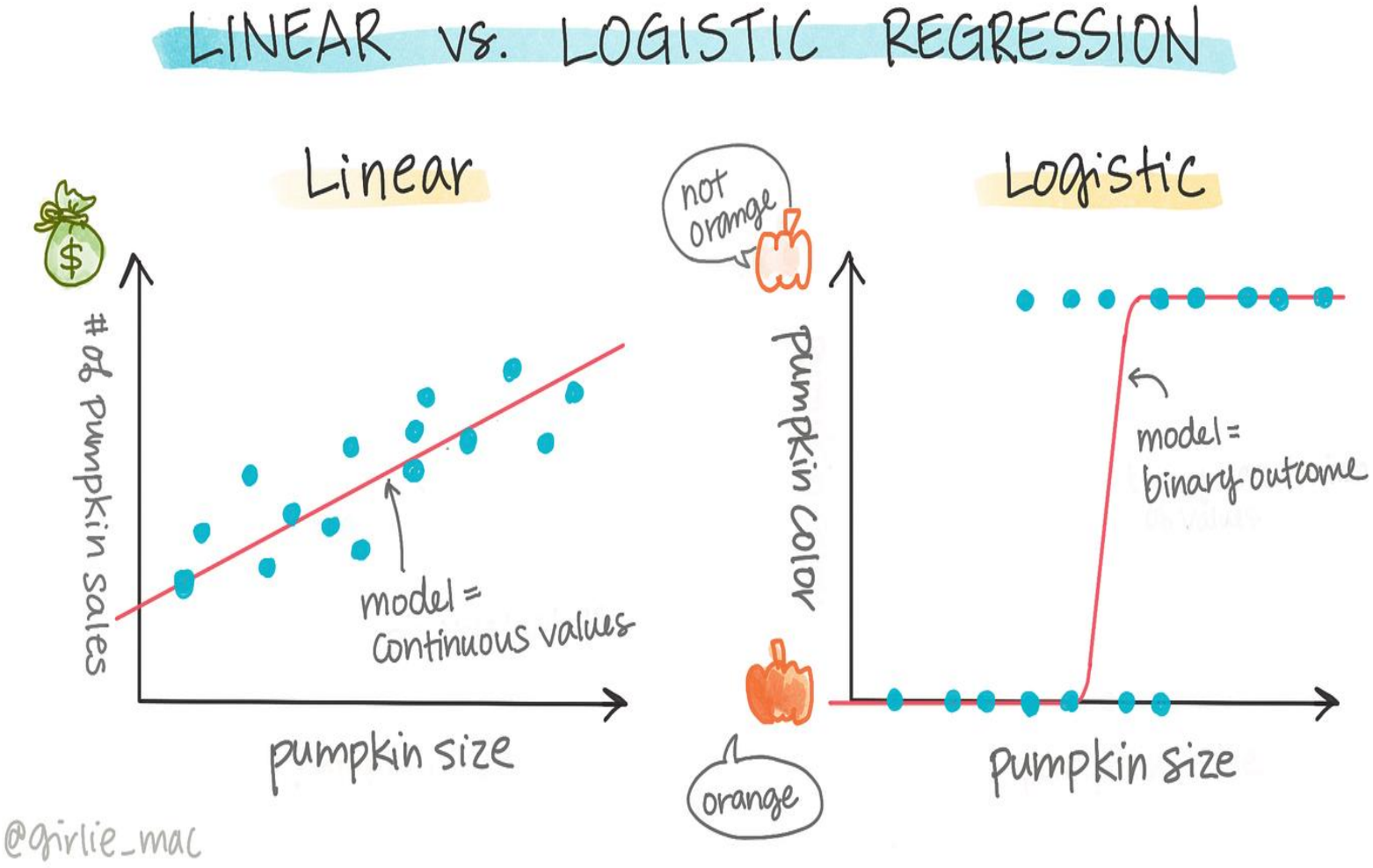
Introduction to Deep Learning concepts



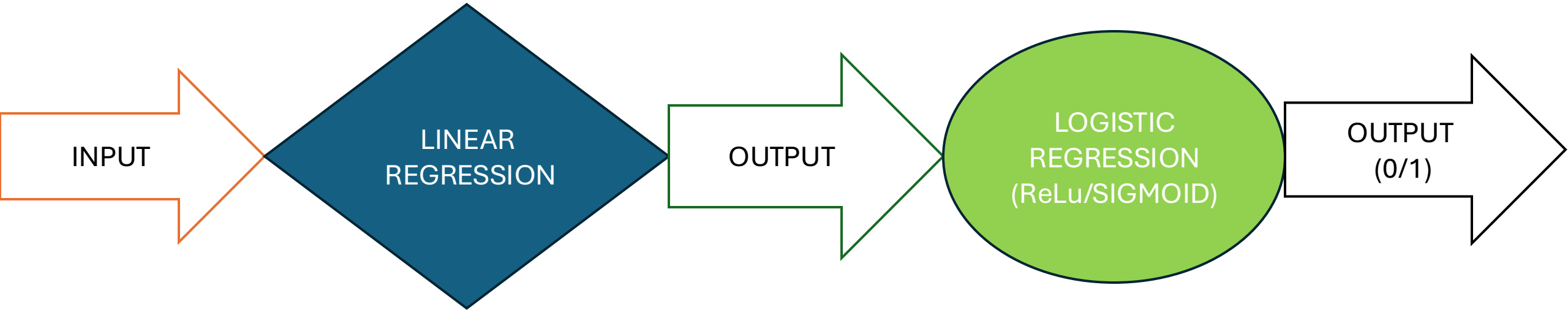
QUESTION 1:

What are some exciting applications of Deep Learning you have seen?

Linear & Logistic Regression

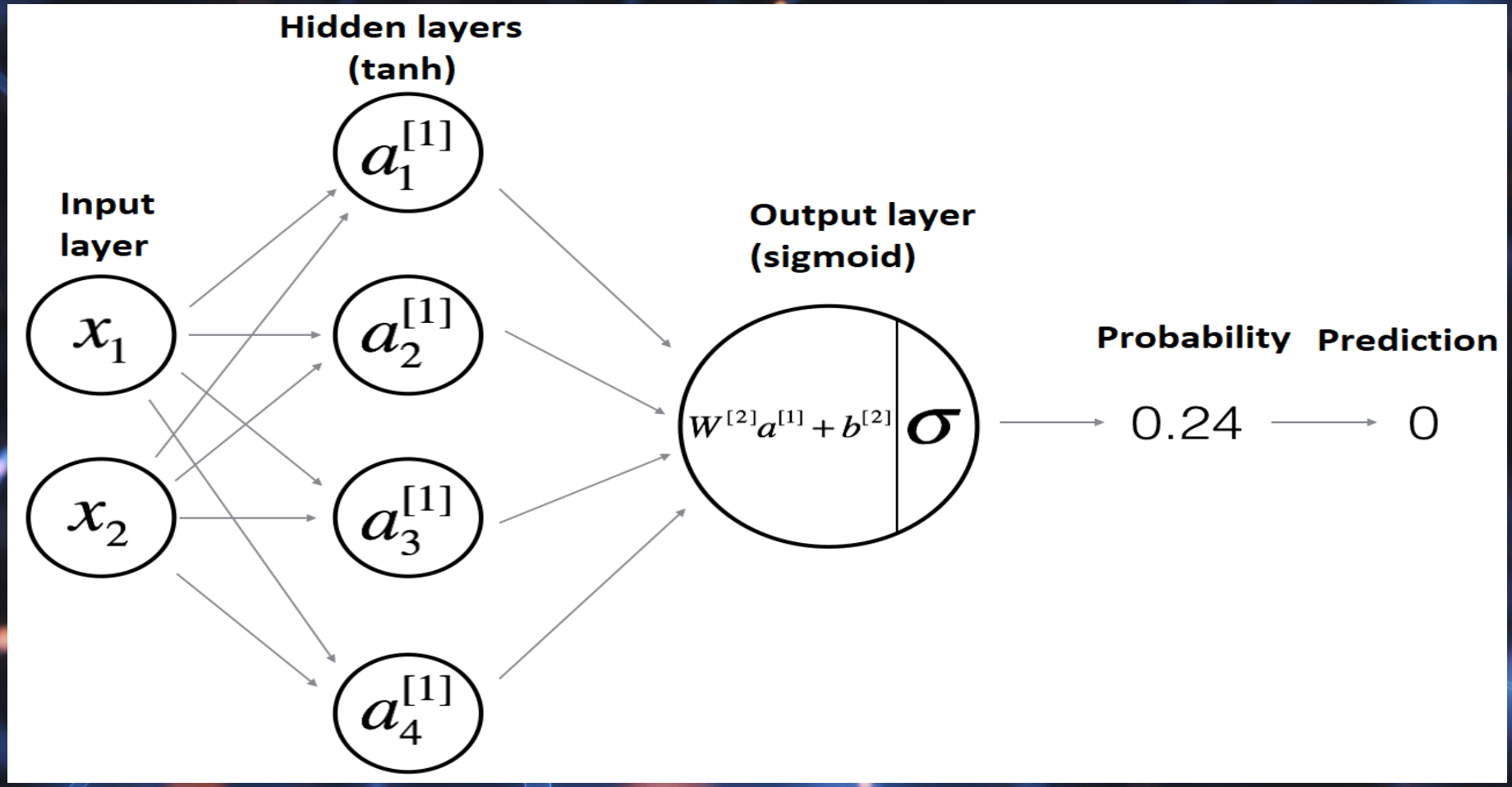


Linear Regression	Logistic Regression
Predicts continuous outcomes.	Predicts categorical outcomes (binary, multinomial).
Assumes a linear relationship between input and output variables.	Uses a logistic function to model a binary outcome.
Output can be any real number.	Output is typically a probability that ranges from 0 to 1.
Commonly used for prediction of amounts or sizes.	Commonly used for classification problems (e.g., spam detection, diagnosis).
Least squares estimation is used for fitting.	Maximum likelihood estimation is used for fitting.
Sensitive to outliers.	Less sensitive to outliers due to the nature of the logistic function.
Assumes homoscedasticity (constant variance of error terms).	Does not assume constant variance of errors.
Coefficients represent the change in the dependent variable for a one unit change in an independent variable.	Coefficients are log-odds, which can be converted into odds ratios for interpretation.


INPUT
LINEAR
REGRESSION
OUTPUT
LOGISTIC
REGRESSION
(ReLu/SIGMOID)
OUTPUT
(0/1)

QUESTION 2:

What do you think makes logistic regression suitable for classification tasks?



NEURAL NETWORKS

Common Activation Functions

- **Sigmoid**
- **ReLu**
- **Tanh**

ACTIVITY

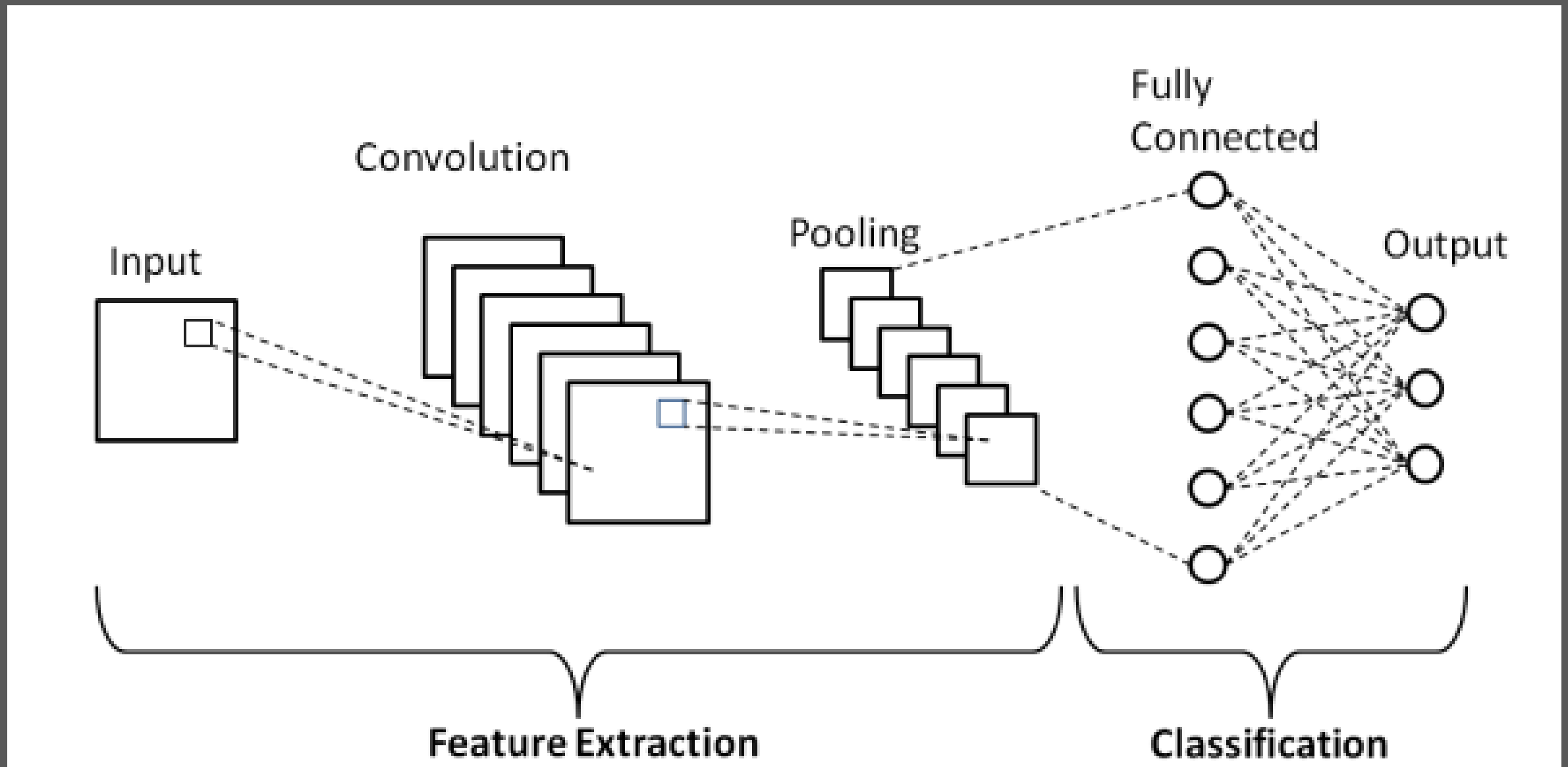

LET'S CODE


CLASSIC NEURAL NETWORKS
CONVOLUTIONAL NEURAL NETWORKS
RECURRENT NEURAL NETWORKS
RESTRICTED BOLTZMANN MACHINES
TRANSFER LEARNING
10 DEEP LEARNING ALGORITHMS
GENERATIVE ADVERSARIAL NETWORKS
SELF - ORGANIZING MAPS
DEEP REINFORCEMENT LEARNING
AUTOENCODERS
BACKPROPAGATION


Building a Deep Learning Model
LET'S DO THIS!

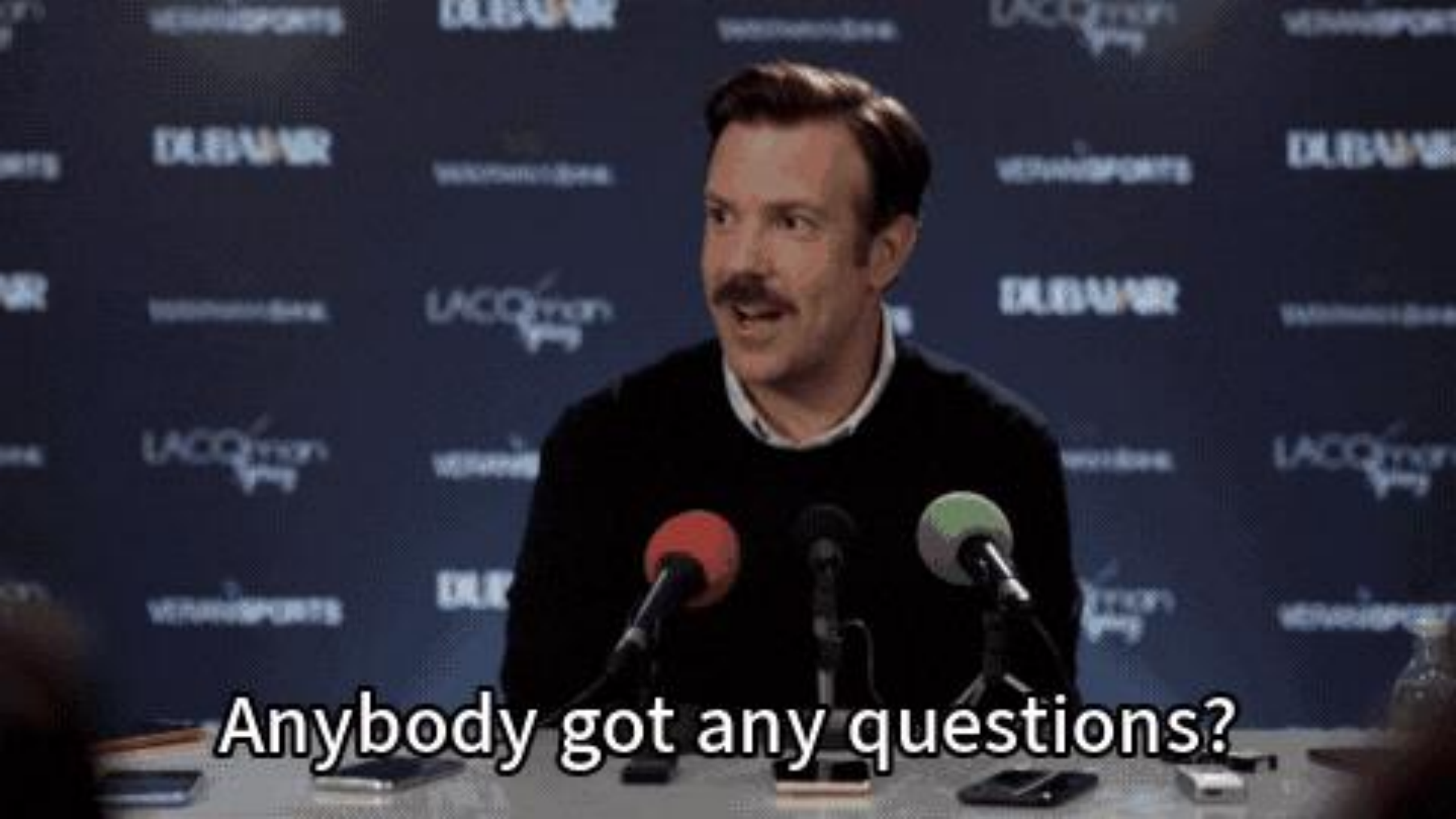
Convolutional Neural Networks (CNN)

CNNs perform more efficiently on image processing tasks. CNNs use a technique known as parameter sharing that makes them much more efficient at handling image data.


Fully
Connected
Convolution
Pooling
Input
Output
Feature Extraction
Classification


LET'S CODE


ACTIVITY


Anybody got any questions?


Bye.