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SUNRISE INSTITUTE

# MACHINE LEARNING

EMBARKING ON A JOURNEY  
INTO DATA SCIENCE

YA MANON



You can have data without information but you  
cannot have information without data.

-Daniel Keys Maran

# Question

*“In your experience so far, from the courses you’ve completed (Fundamental Data Science, Programming for Data Science, Statistics for Data Science, etc.), what are the key concepts or skills you’ve found most useful in your work? Could you give examples of how you applied them?”*

- **Programming**
- **Data Analysis and Visualization**
- **Statistics Exploration**

# Library We Used

General Purpose  
Programming



Data Manipulation  
& Analysis



Data Visualization



Machine Learning



# Library We Will Be Using

General Purpose  
Programming



Data Manipulation  
& Analysis



Data Visualization



Machine Learning



# Library We Will Be Using

## General Purpose Programming



## Data Manipulation & Analysis



**Pandas** helps us structure our data into dataset formats similar to that which you'd see in SQL or Excel. It also provides us with an arsenal of analytical functions that help us manipulate data and calculate the metrics we need to understand our data

## Data Visualization



**Matplotlib** and **Seaborn** can create a wide array of visually appealing, static visualizations

**Plotly** can be used to create interactive visualizations and dynamic dashboards

## Machine Learning



**Scikit learn** is among the most popular tools for building and testing machine learning models

**Statsmodels** provides a suite of tools for model building and statistical analysis

**TensorFlow** is the industry standard for developing deep learning models

# ML?



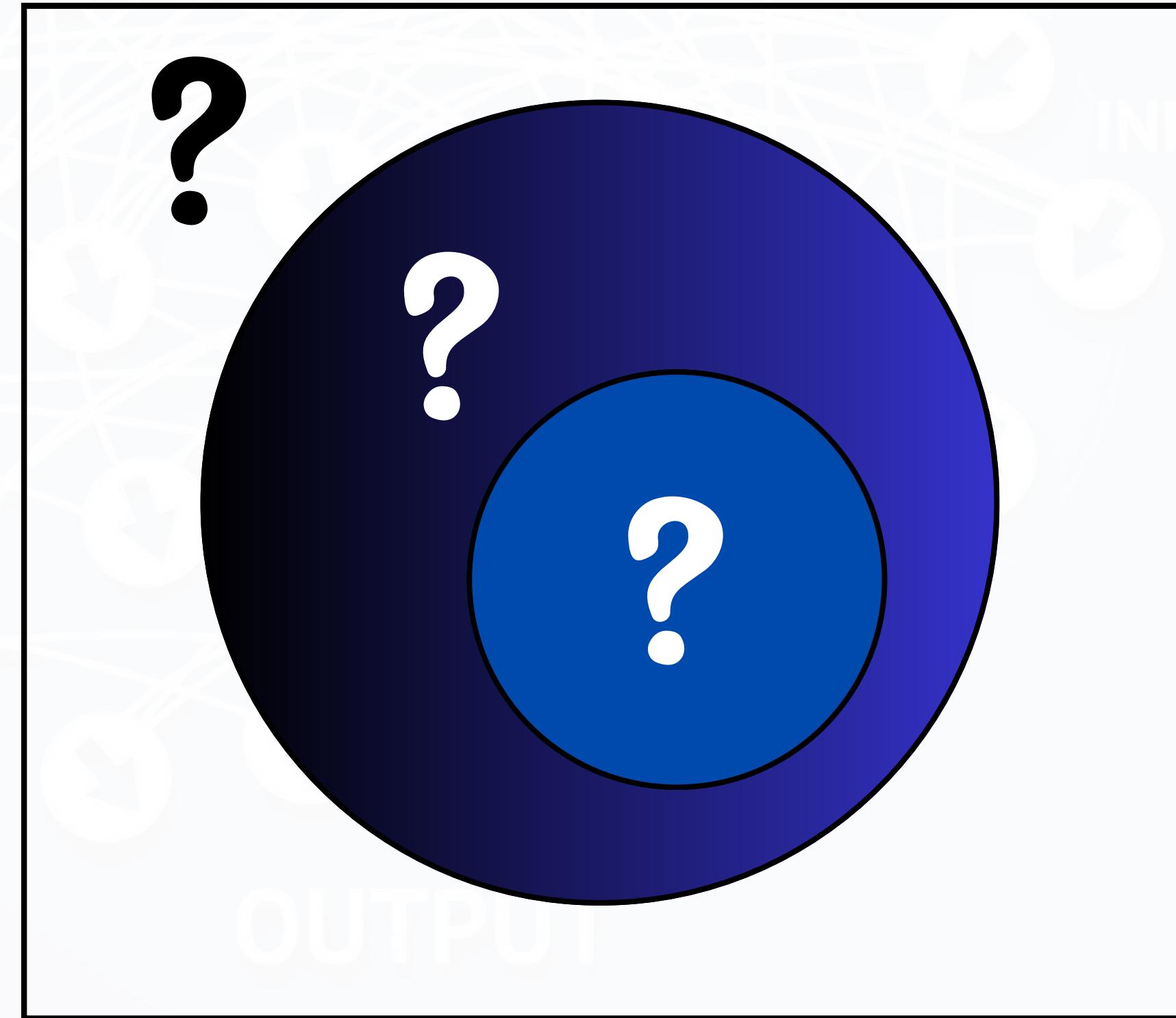
# Meet Artificial intelligence

- Face recognition
- ChatGPT (Generative AI)
- Recommendation System

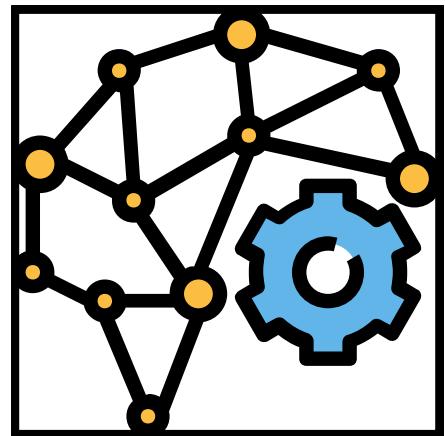
Machine Learning

Artificial Intelligence

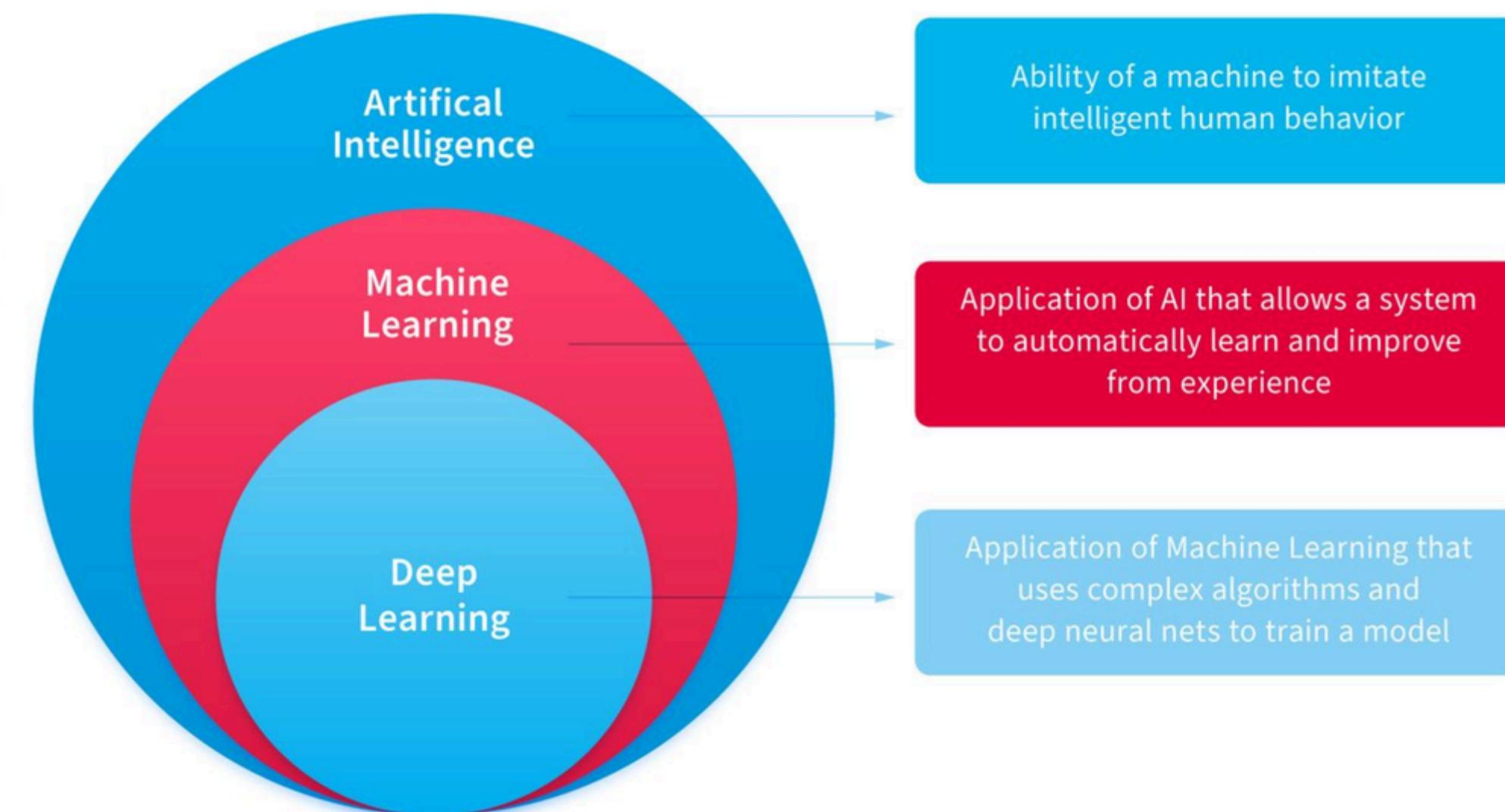
Deep Learning



# Meet Machine Learning



- **Machine Learning** is a subset of **Artificial Intelligence** (AI) that enables systems to learn from data, identify patterns, and make decisions with minimal human intervention.



# Application of Machine Learning

**Social Media Features**

**Sentiment Analysis**

**Image Recognition**

**Product Recommendations**

**NLP Detection**

**Language Translation**

**Customer Churn**

# Challenges in ML Deployment

# MLC?



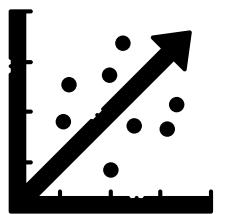
As per [research](#), only 13% of ML models ever make it to production. This is a huge gap, considering the possibilities that AI model deployment can bring to the organization.

# Types of Machine Learning



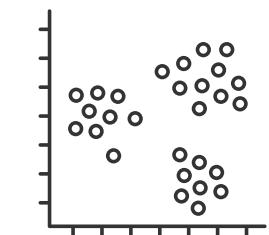
## Machine Learning

### Supervised Learning



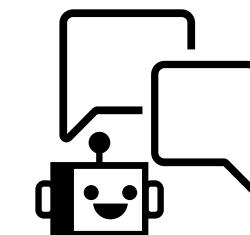
Task Driven  
Classification/Regression

### Unsupervised Learning



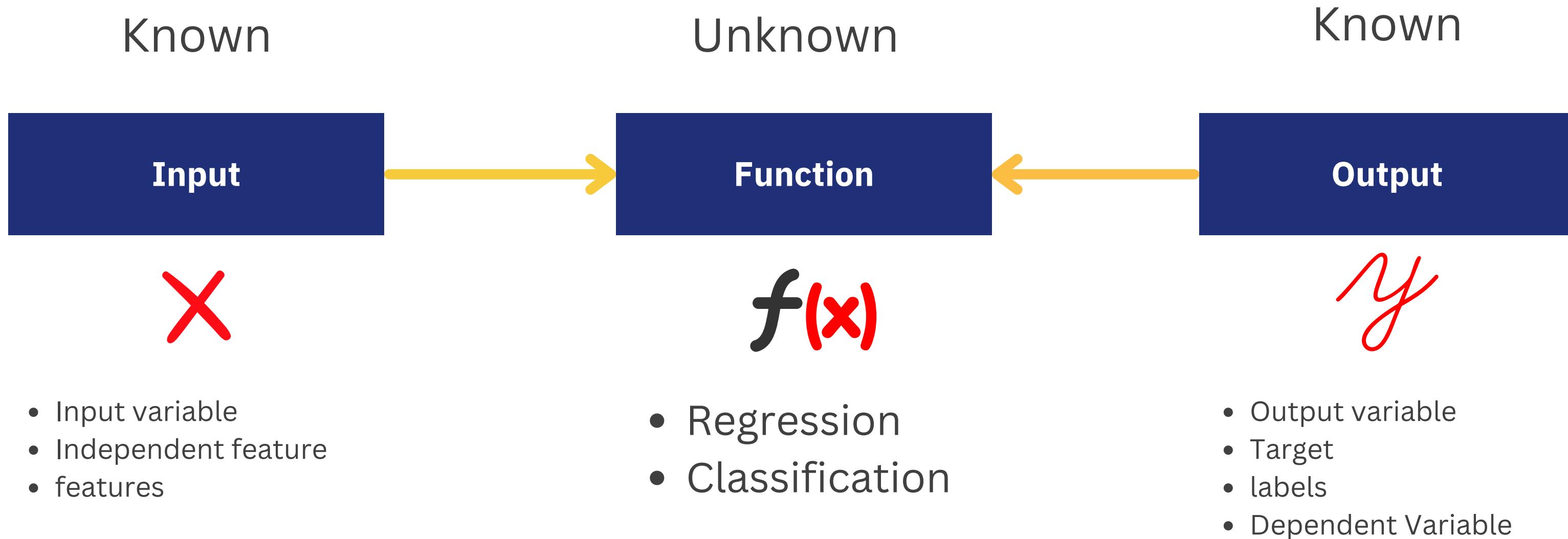
Data Driven  
Clustering

### Reinforcement Learning



Learning from mistake  
Game/self driven car

# Supervised Learning



**Machine Learning** is (supervised learning) models learn from data and make predictions.

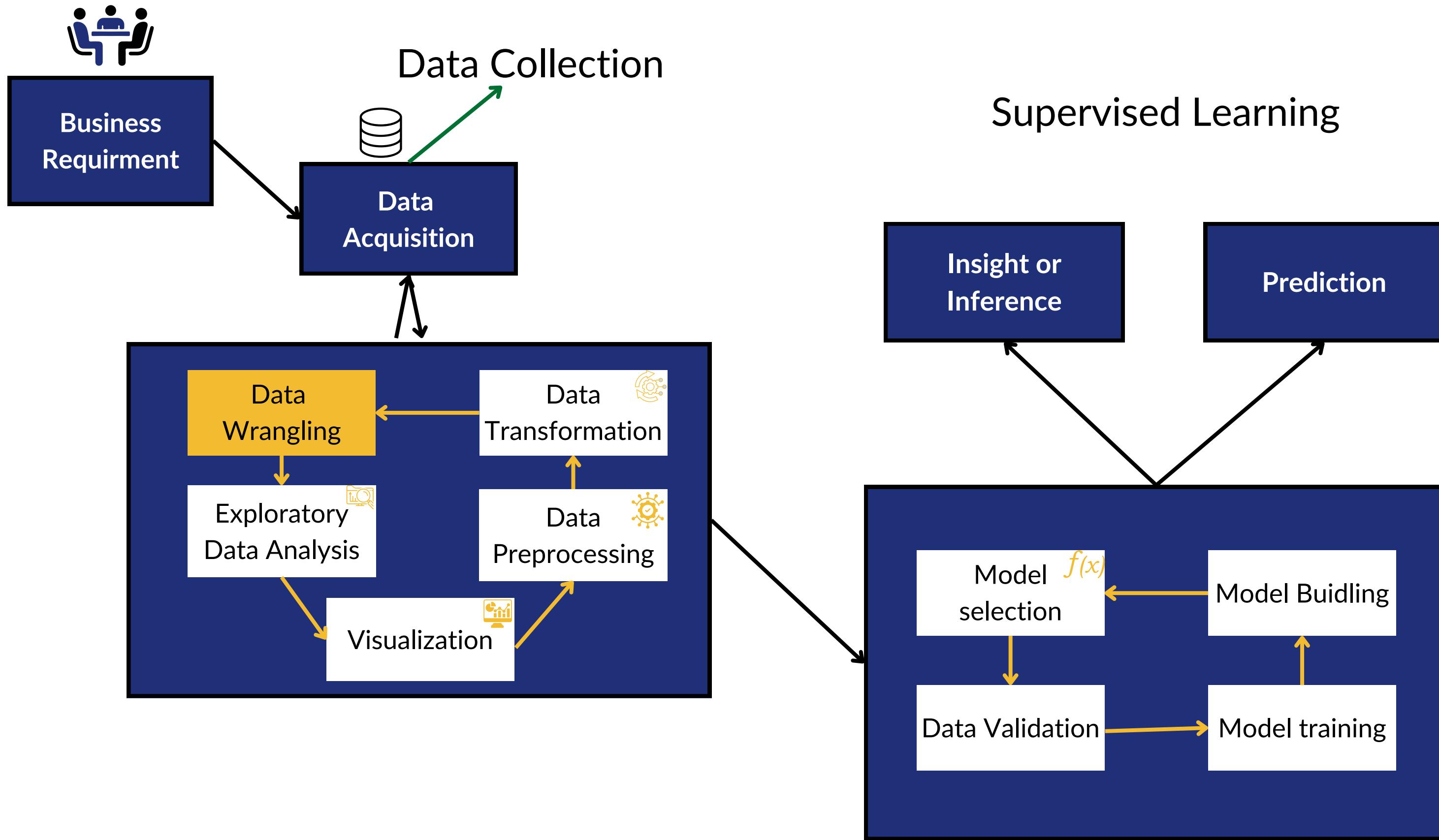
# Supervised Learning/Classification

Classification	Answer
<ul style="list-style-type: none"><li>• Will this loan application be approved or denied?</li><li>• Will a customer churn or stay with the company?</li><li>• Is this spam gmail?</li><li>• You have cancer or not?</li><li>• Is this image a cat, dog, or another animal?</li></ul>	<ul style="list-style-type: none"><li>• approved or denied</li><li>• Non-churn or Churn</li><li>• Spam or Not</li><li>• Yes or no</li><li>• Dog , Cat, another</li></ul>

# Supervised Learning/Regression

Regression	Answer
<ul style="list-style-type: none"><li>• Predict the amount of loan disbursed to a customer based on their profile.</li><li>• Predict the interest rate offered to a customer based on their financial and credit history.</li><li>• Predict a customer's income based on their loan application and credit data.</li><li>• You have cancer or not?</li><li>• Is this image a cat, dog, or another animal?</li></ul>	<ul style="list-style-type: none"><li>• Loan amount</li><li>• Predicting Interest Rate</li><li>• Customer's Income</li><li>• Yes or no</li><li>• Dog , Cat, another</li></ul>

# Machine Learning Life Circle



# Supervised Learning

