

WELCOME

Bootcamp

on

AI/ML

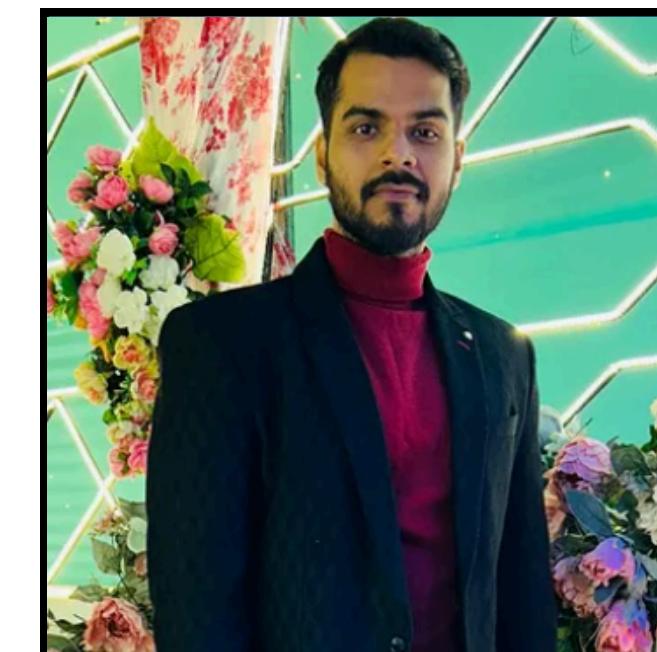


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So

What is AI?





**AI is the ability of a machine to
integrate and mimic natural
intelligence.**

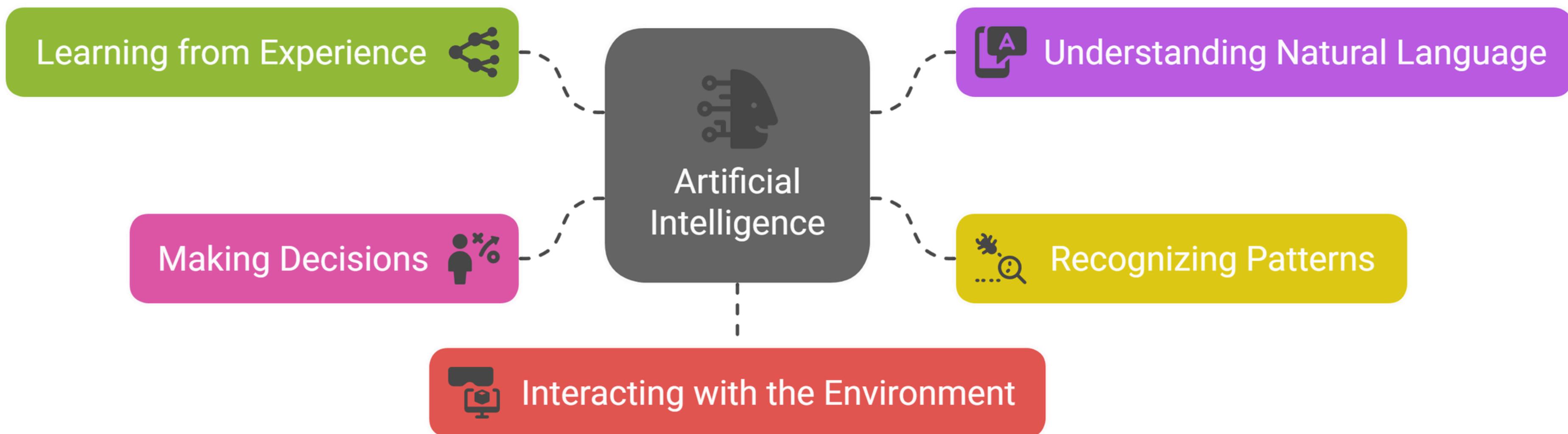
Branch of computer science that focuses on creating systems that can perform tasks that typically require human intelligence.

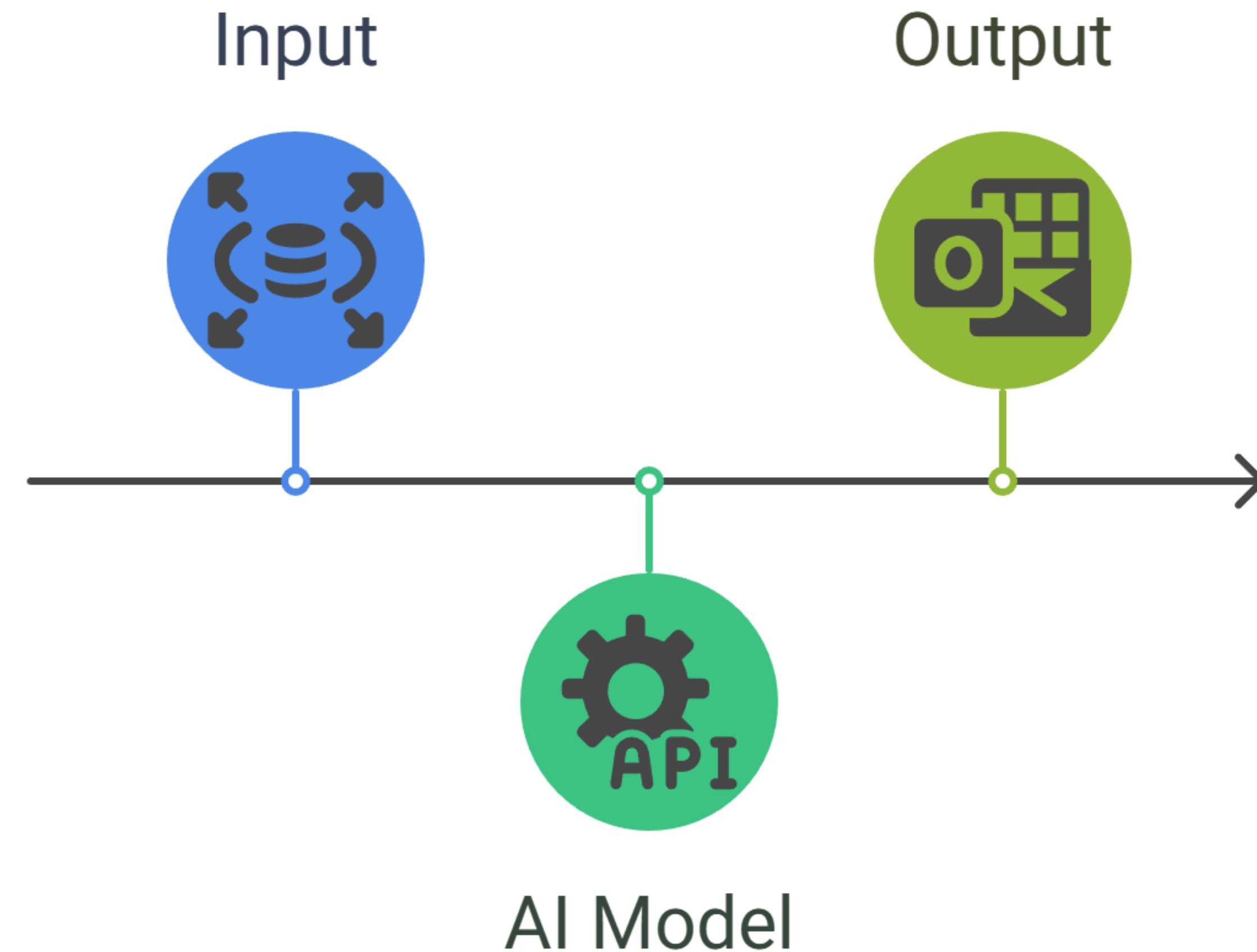
These tasks include:

- Learning from experience (like humans do)
- Understanding natural language (text or speech)
- Recognizing patterns (images, data, behavior)
- Making decisions or solving problems
- Interacting with the environment (robots, autonomous systems)

Core capabilities of AI

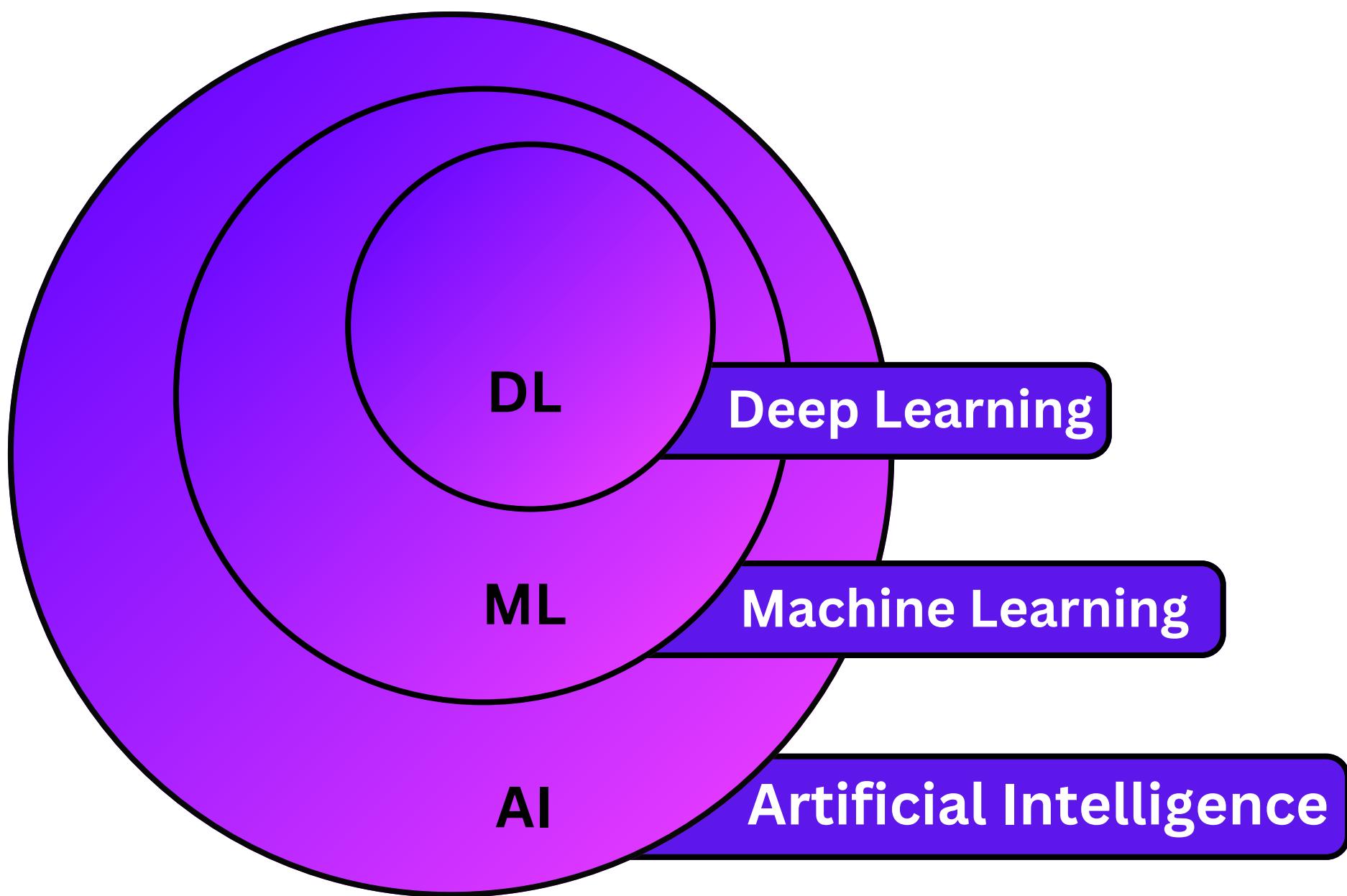
What is AI?





Core Concepts of AI

Machine Learning



Machine Learning



Traditional Programming

Follows predefined rules to generate output

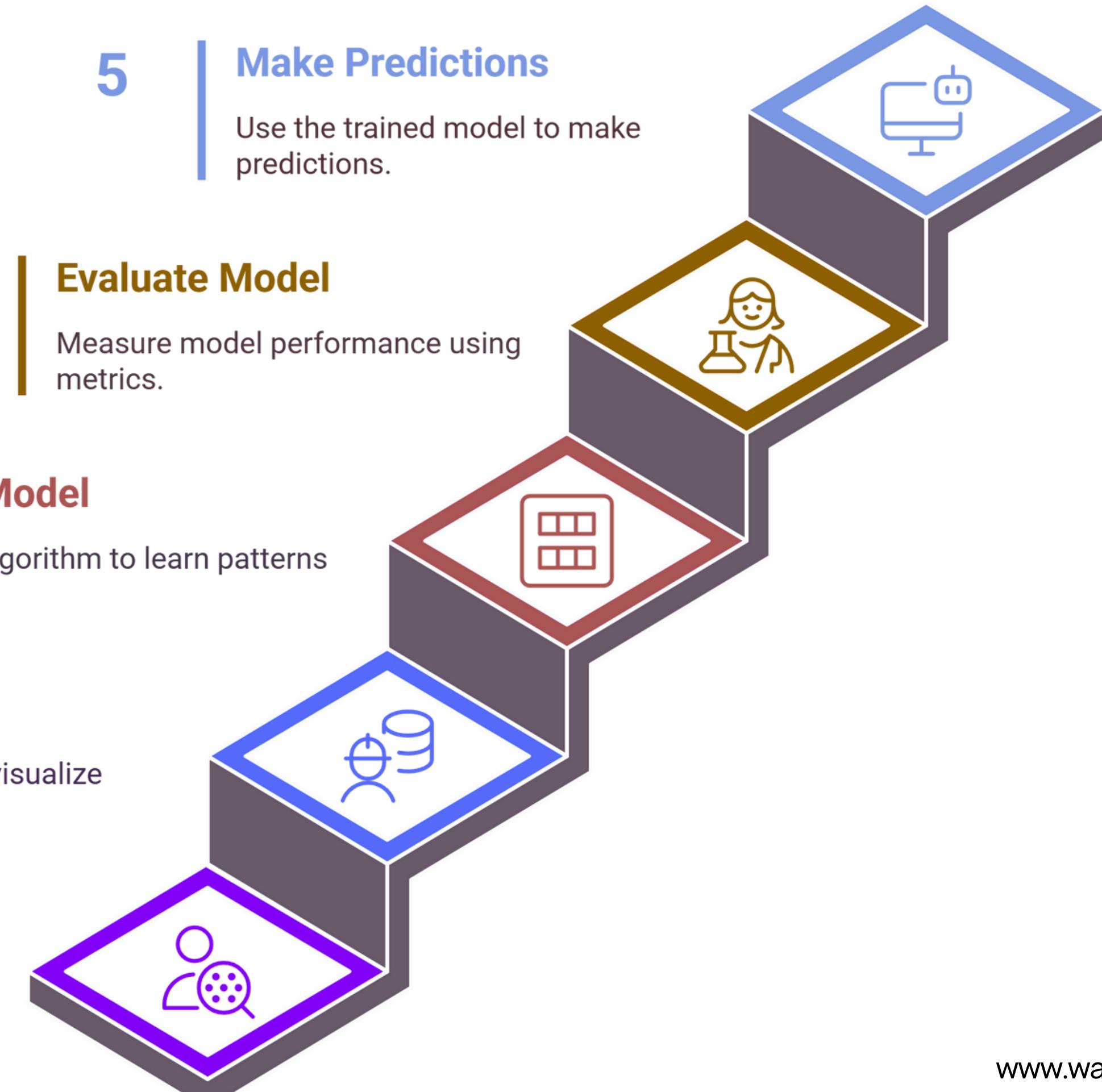


Machine Learning

Derives rules from data to generate output

Machine Learning Steps

- 1 Collect Data**
Gather relevant data (structured or unstructured).
- 2 Preprocess Data**
Clean, transform, and visualize data.
- 3 Train Model**
Use an algorithm to learn patterns in data.
- 4 Evaluate Model**
Measure model performance using metrics.
- 5 Make Predictions**
Use the trained model to make predictions.

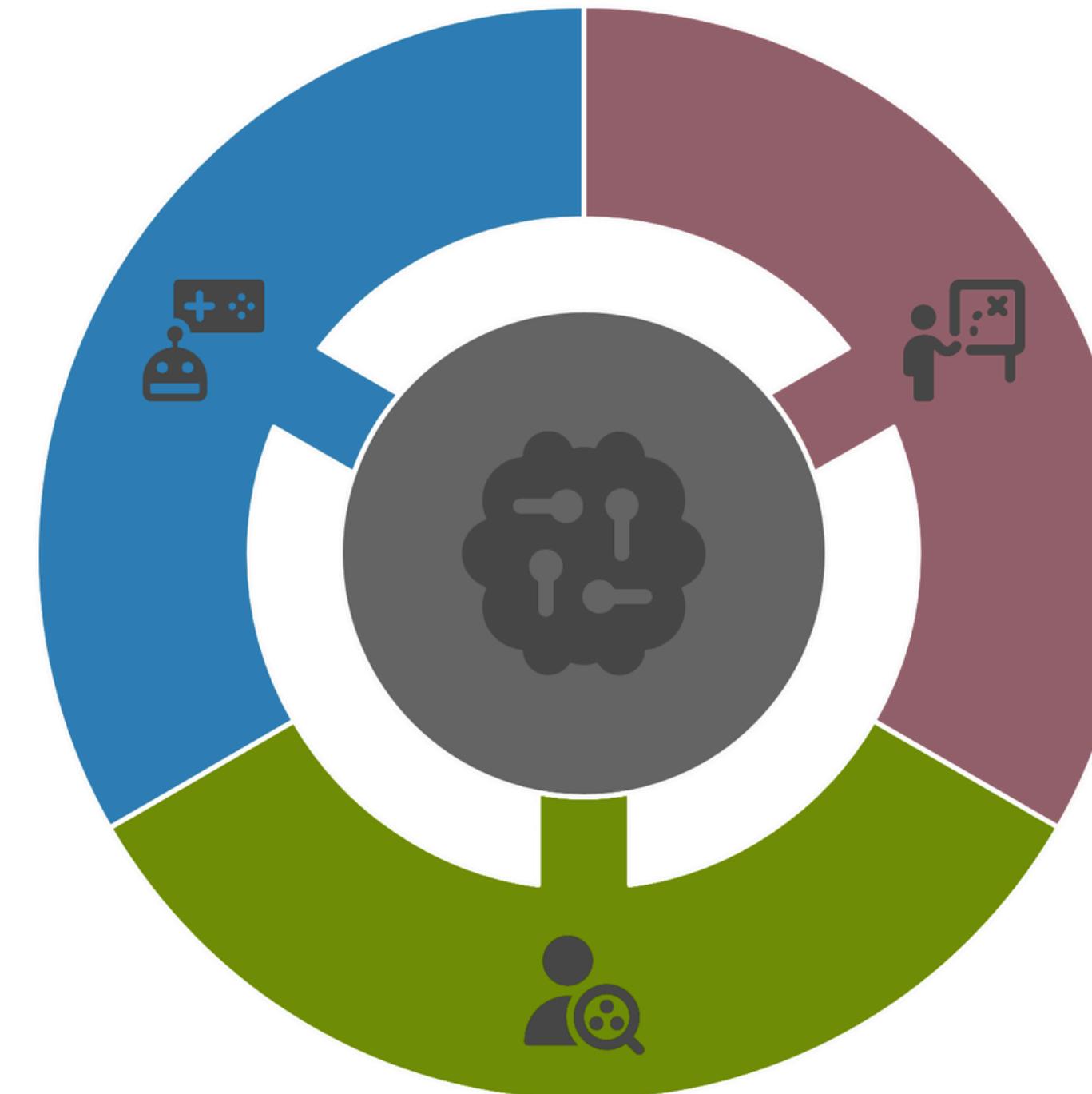


Types of Machine Learning

Core Concepts of AI

Reinforcement Learning

Adapts through interaction and feedback



Supervised Learning

Learns from labeled data to make predictions

Unsupervised Learning

Discovers patterns in unlabeled data

Machine Learning

- Broad field of algorithms learning from data



Neural Networks

- Computational models inspired by the brain



Deep Learning

- Models complex patterns using neural networks

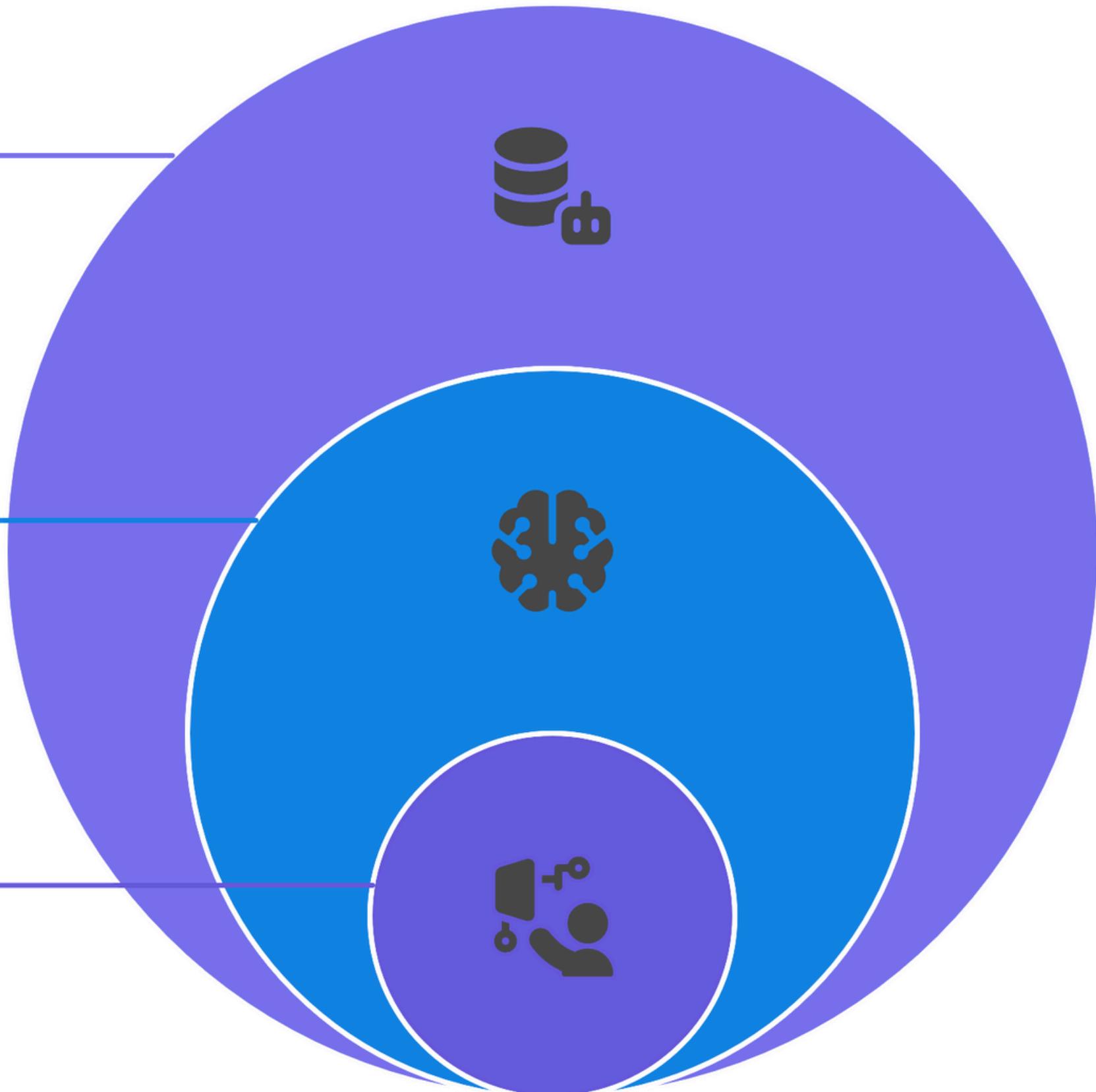




Image Recognition

Technology that identifies objects in images.

Technology that converts spoken language into text.

Speech Recognition



Language Translation

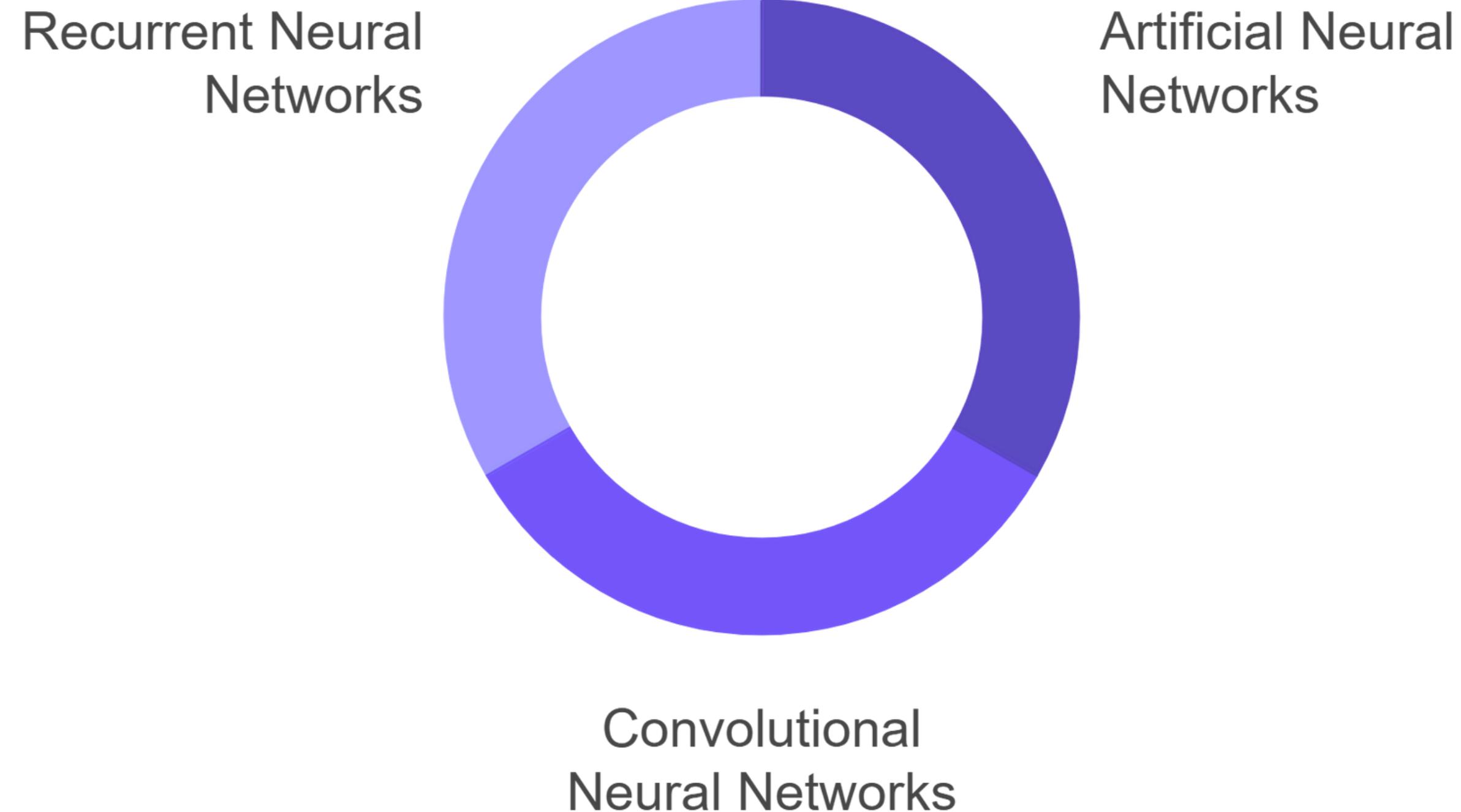
Technology that translates text from one language to another.

Technology that allows vehicles to drive themselves.

Autonomous Driving



Types of Deep Learning



Tools we need for

Python

NumPy

Pandas

Scikit

Matplotlib

Seaborn

TensorFlow

Jupyter Notebook

VSCODE

Install Python

Download from Python.org

<https://www.python.org/downloads/windows/>

Download version 3.9.13 supported by TensorFlow

or

Download from Wayo Labs :Code Lab Google Drive

https://drive.google.com/drive/folders/1I1hu2P34R_yrx4jxxiR-E8ck3RobO1Qa?usp=drive_link

Start Terminal and install tensorflow

```
pip install tensorflow
```

Test TensorFlow

```
python -c "import tensorflow as tf; print(tf.__version__)"
```

Option 1. With Python Only

Install other libraries

```
pip install pandas numpy matplotlib seaborn scikit-learn
```

Option 1. With Python Only

VSCODE

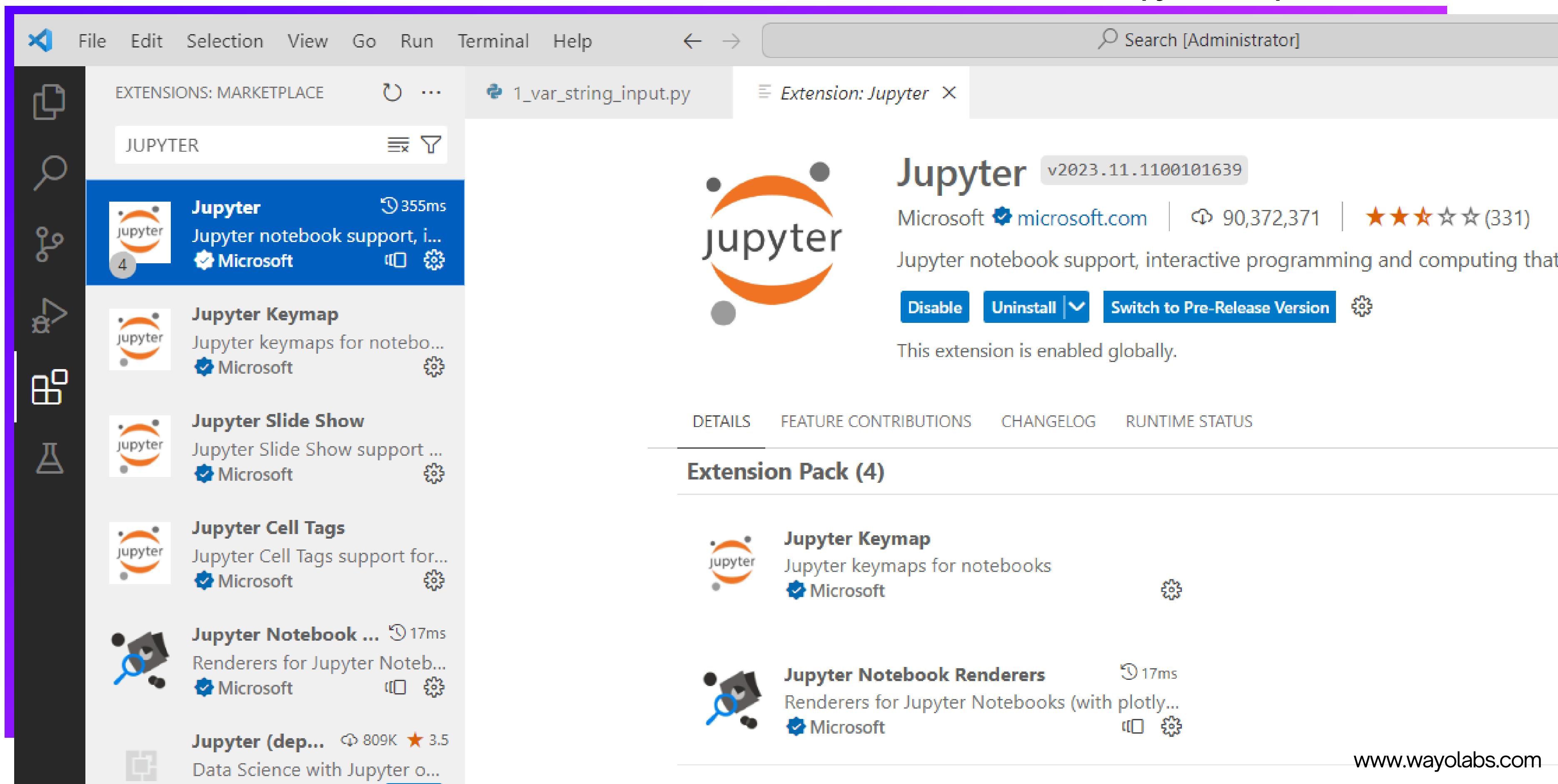
IDE of choice

<https://code.visualstudio.com/>

Option 1. With Python Only

Installation

Jupyter Notepad Extension in VSC



The screenshot shows the Visual Studio Code (VSC) interface. The top bar includes File, Edit, Selection, View, Go, Run, Terminal, Help, and a search bar. On the left is a dark sidebar with icons for file, search, connections, and others. The main area shows an 'EXTENSIONS: MARKETPLACE' sidebar with 'JUPYTER' selected. Under 'JUPYTER', the 'Jupyter' extension by Microsoft is highlighted, showing it's version 2023.11.1100101639, has 90,372,371 installs, and a 4.5-star rating. It provides support for Jupyter notebooks. Below it are other Jupyter extensions: 'Jupyter Keymap', 'Jupyter Slide Show', 'Jupyter Cell Tags', and 'Jupyter Notebook Renderers'. The 'Jupyter' extension details page is open, showing its logo, version, developer, popularity, and a message stating it's enabled globally. It also lists its extension pack and individual components.

File Edit Selection View Go Run Terminal Help ← → Search [Administrator]

EXTENSIONS: MARKETPLACE ...

JUPYTER

Jupyter 355ms
Jupyter notebook support, i... Microsoft

Jupyter Keymap
Jupyter keymaps for notebo... Microsoft

Jupyter Slide Show
Jupyter Slide Show support ... Microsoft

Jupyter Cell Tags
Jupyter Cell Tags support for... Microsoft

Jupyter Notebook Renderers 17ms
Renderers for Jupyter Noteb... Microsoft

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Data Science with Jupyter o...

Extension: Jupyter

Jupyter v2023.11.1100101639

Microsoft microsoft.com | 90,372,371 | ★★★★☆ (331)

Jupyter notebook support, interactive programming and computing that

Disable Uninstall Switch to Pre-Release Version ⚙

This extension is enabled globally.

DETAILS FEATURE CONTRIBUTIONS CHANGELOG RUNTIME STATUS

Extension Pack (4)

Jupyter Keymap
Jupyter keymaps for notebooks Microsoft

Jupyter Notebook Renderers 17ms
Renderers for Jupyter Notebooks (with plotly...) Microsoft

www.wayolabs.com

Download & Install one of the following

https://drive.google.com/drive/folders/1I1hu2P34R_yrx4jxxiR-E8ck3RobO1Qa?usp=drive_link

Anaconda (take larger space)

or

Miniconda (for lower space)

Start Anaconda Prompt from Start Menu

```
conda create --name tensorflow_env python=3.9
conda activate tensorflow_env
conda install -c conda-forge tensorflow
python -c "import tensorflow as tf; print(tf.__version__)"
```

Install other libraries

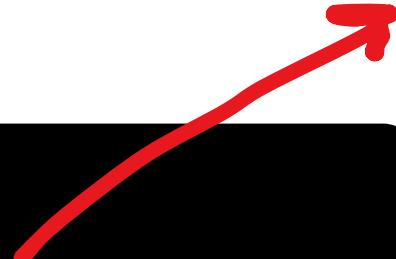
```
pip install pandas numpy matplotlib seaborn scikit-learn
```

Option 2. With Conda Environment

Reinstalling Trial

```
conda deactivate
```

If environment is active, deactivate first



```
conda remove --name tf_env --all
```

environment name

```
conda clean --all --yes
```

Now try Installation

Python for AI/ML

- **Python Foundations for AI/ML**
- **Python Data Structures + NumPy**
- **Pandas + Data Visualization**
- **Python for ML – Scikit-learn Essentials**