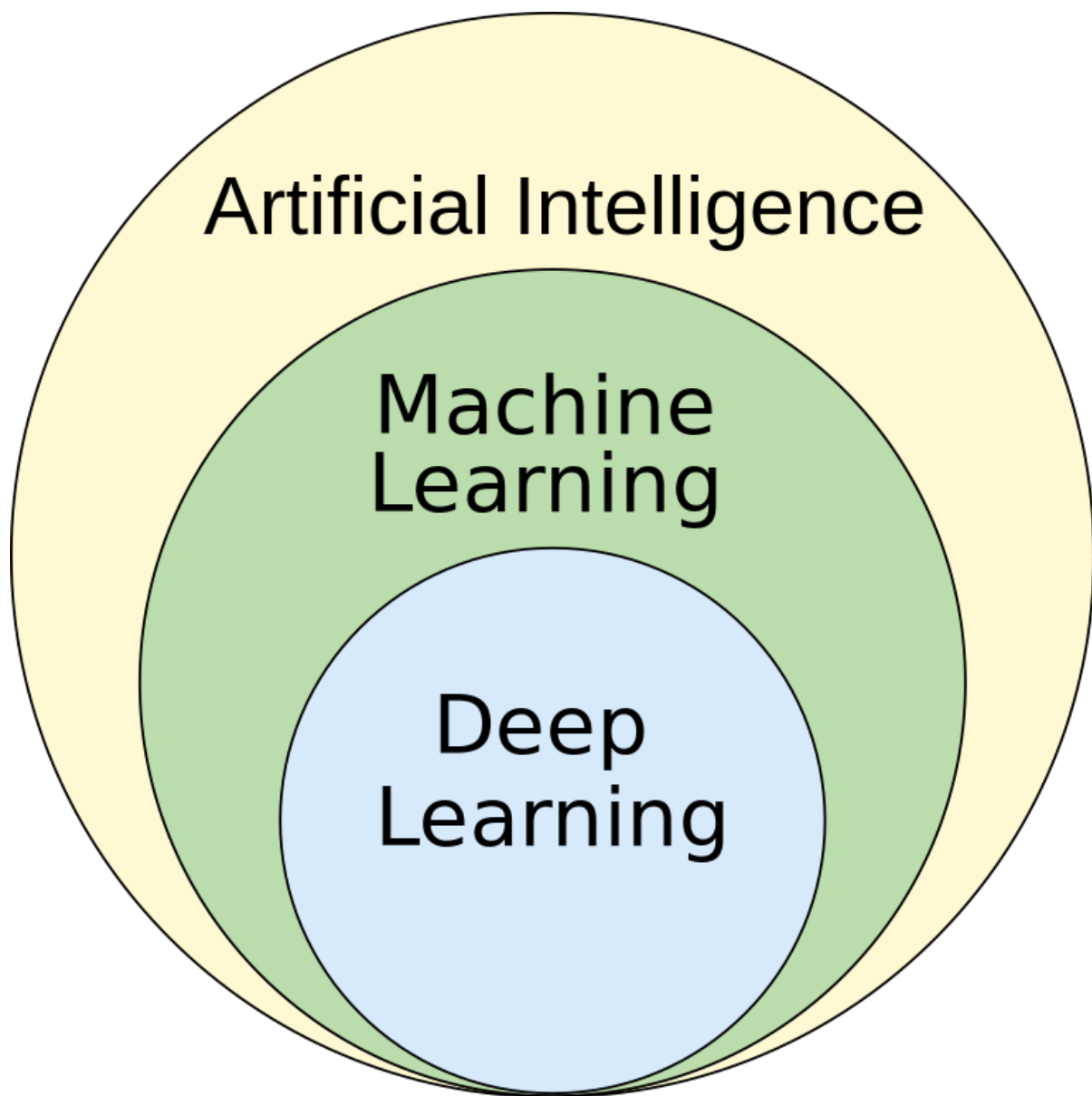


■ What is Deep Learning?

- A type of machine learning based on artificial [neural](#) networks in which multiple layers of processing are used to extract [progressively](#) higher level features from data.
- Deep learning is a subfield of artificial intelligence that uses artificial neural networks to learn and make decisions from data.
- Subfield of AI where artificial neural networks use data to learn and make decisions from data.

■ Machine Learning:-

- Machine learning is turning things into numbers (data), and finding patterns in that data.
- Formally, Machine learning is a subfield of artificial intelligence that enables computer systems to automatically learn and improve from experience without being explicitly programmed.



■ What Deep Learning is good for?

1) Problems with long list of rules.

2) Traditional approach fail khayō vane, ML/DL might help

3) Continuously changing environment xa vane ,DL can easily adapt new changes

4) Large data bata insight nikalda.

■ What Deep Learning is typically not good for?

➤ When we need explainability.

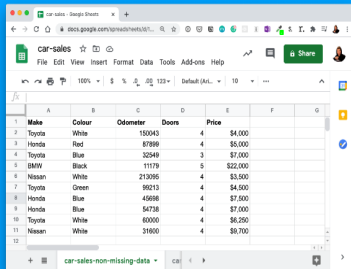
➤ Traditional approach le easily problem solve hunxa vane ,we need not to implement ML/DL.

➤ When errors are unacceptable.

➤ Large amount of data nahuda, ML/DL apply garna sakkina.

Machine Learning vs. Deep Learning

Machine Learning




	Make	Colour	Odometer	Doors	Price
1	Toyota	White	150041	4	\$4,000
2	Honda	Red	97989	4	\$5,000
3	Toyota	Blue	32549	3	\$7,000
4	BMW	Black	11179	5	\$22,000
5	Nissan	White	21395	4	\$3,500
6	Toyota	Green	99213	4	\$4,500
7	Honda	Blue	45688	4	\$7,000
8	Honda	Blue	67738	4	\$7,000
9	Toyota	White	60000	4	\$6,250
10	Nissan	White	31600	4	\$9,700



Structured data

Deep Learning



Daniel Bourke @mrbourke · Nov 1
"How do I learn #machinelearning?"

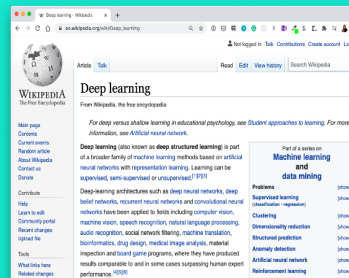
What you want to hear:

1. Learn Python
2. Learn Math/Stats/Probability
3. Learn software engineering
4. Build

What you need to do:

1. Google it
2. Go down the rabbit hole
3. Resurface in 6-9 months and reassess

See you on the other side.



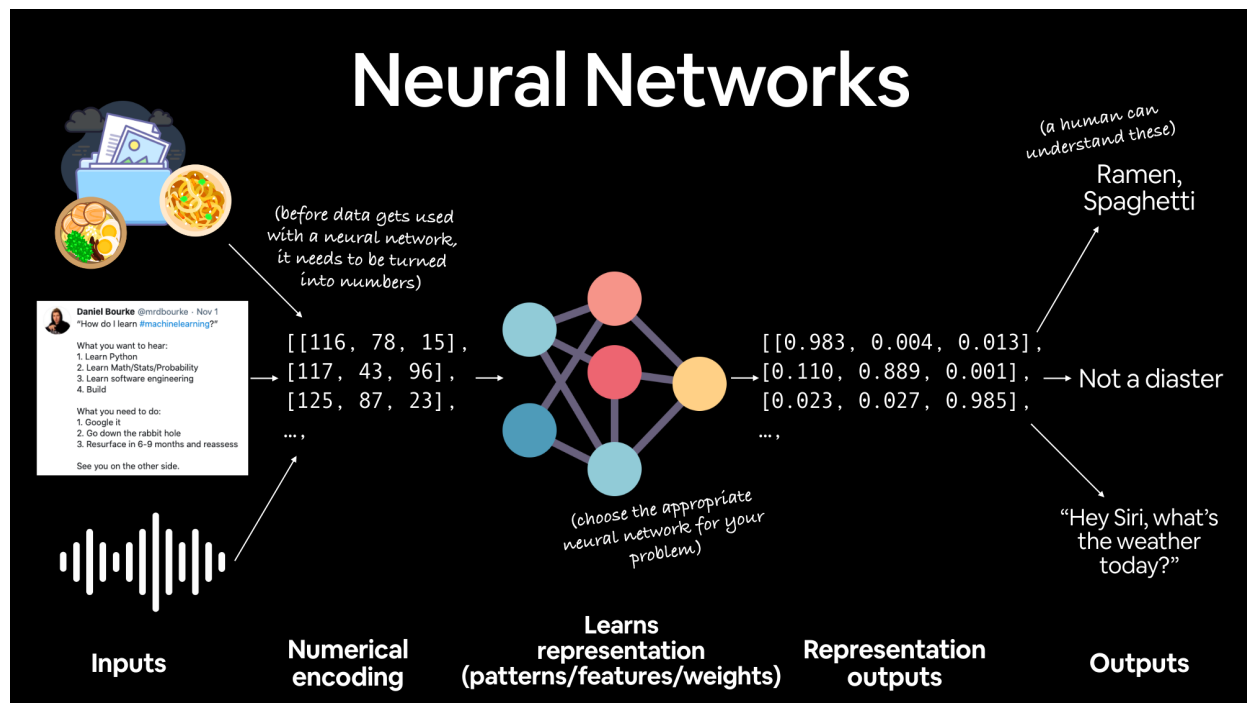
Unstructured data

■ Neural Network:-

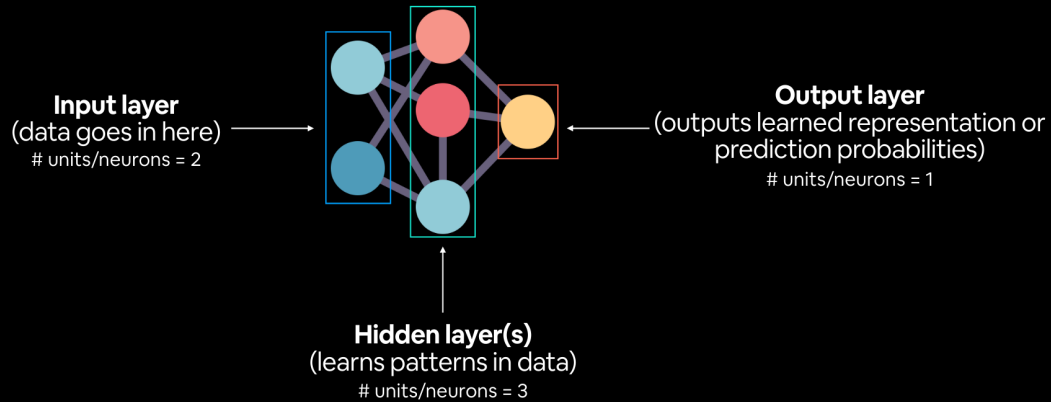
➤ Neural networks are computational models composed of interconnected nodes, designed to simulate the information processing of biological neurons, used for various machine learning tasks including pattern recognition and data analysis.

➤ AI ko euta method jasl human brain maa jasari neurons ek arka sanga interconnect vayera information

process garxan,tesari nai neural network maa pani
neurons haru hunxan and they are used for ml tasks
including pattern recognition and data analysis.



Anatomy of Neural Networks



Note: “patterns” is an arbitrary term, you’ll often hear “embedding”, “weights”, “feature representation”, “feature vectors” all referring to similar things.

■ Types of learning:-

➤ **Supervised:-** The model is trained on labeled data to make predictions or classifications.

(input ra label haru hunxa)

➤ **Semi-supervised:-** Uses a combination of labeled and unlabeled data to improve model performance.

(label vanda input dherai hunxa)

➤ **Unsupervised:-** Model learns patterns and structures from unlabeled data without predefined target outcomes.

(data matrai hunxa label hudaina ,model le aafai pattern patta lagayera output /label dinxa.)

➤ **Transfer learning:-** A machine learning technique that uses a pre-trained model to improve the performance of a new model on a related task.

■ **Tensorflow** :-

- TensorFlow is an open-source machine learning framework developed by Google that enables the creation and training of neural networks for various artificial intelligence tasks.
- End-to-end machine learning platform.
- we can write fast ML/DL code in python or in other language (able to run on GPU/TPU→Tensor Processing Unit)
- We can access many prebuilt deep learning models.

■ **What is a Tensor?**

- A tensor is a multi-dimensional array of elements organized by a set of indices.
- Tensors are a way to represent information in a numerical way.

■ Tensorflow workflow:-

