Difference Between ANN, CNN, and RNN

ANN (Artificial Neural Network)

- **Structure**: Fully connected layers (input → hidden → output)
- **Data Type**: General-purpose (structured or tabular data)
- **Memory**: No memory of previous inputs

Used For:

- Tabular data classification or regression
- Spam detection
- Stock price prediction (basic)
- Credit scoring

CNN (Convolutional Neural Network)

- **Structure:** Uses convolutional and pooling layers to extract spatial features
- **Data Type:** 2D/3D data (images, videos)
- **Memory:** No memory of sequences

Used For:

- Image classification (e.g., cats vs dogs)
- Object detection (e.g., YOLO, SSD)
- Medical imaging (e.g., Tumour detection)
- Video frame analysis
- Face recognition

RNN (Recurrent Neural Network)

- **Structure:** Recurrent connections; output depends on previous inputs
- **Data Type:** Sequential (time-series, text)
- **Memory:** Remembers previous steps in a sequence

Used For:

- Time series forecasting (weather, stock prices)
- Text generation and sentiment analysis
- Language translation (with LSTM/GRU)
- Speech recognition

Quick Comparison Table

Feature	ANN	CNN	RNN
Input Type	Tabular	Images / Spatial data	Sequences / Time series
Key Layer	Dense	Convolutional	Recurrent (LSTM/GRU)
Memory	❌	❌	✅
Used For	Classification	Vision tasks	Language, speech, time