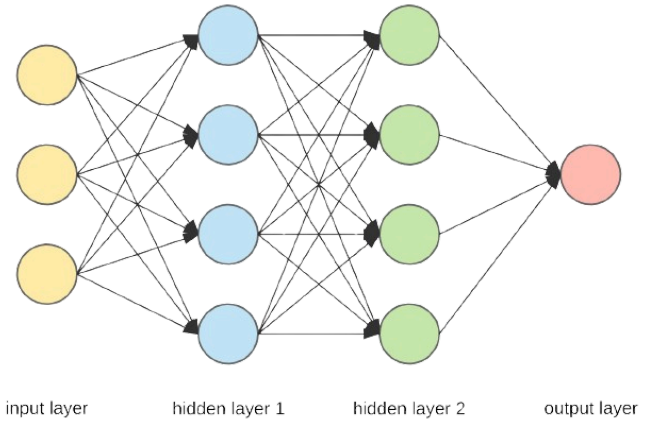
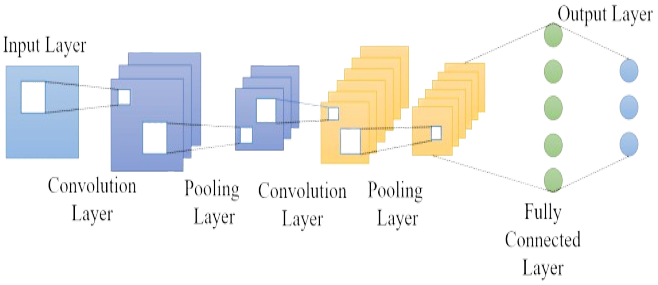
# Deep Learning Cheatsheet

## 1. ANN (Artificial Neural Network)



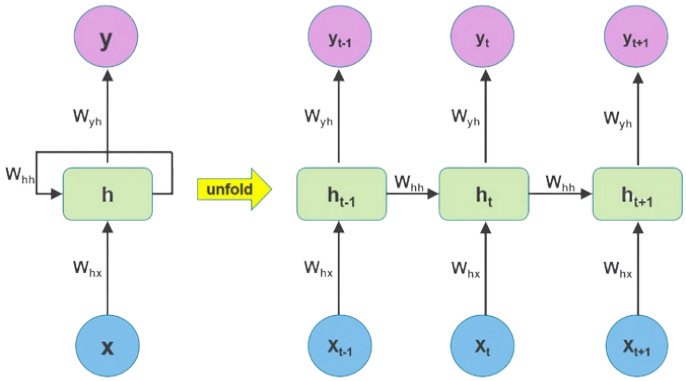

- Used for Tabular data, Structured Data
- **Application:** pattern recognition, classification, regression etc

## 2. CNN (Convolutional Neural Network)



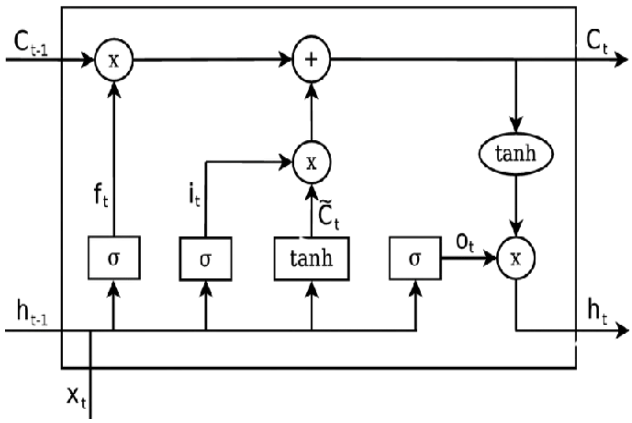

- Used for Image dataset
- **Application:** Image classification, object detection, facial recognition etc

## 3. RNN (Recurrent Neural Networks)



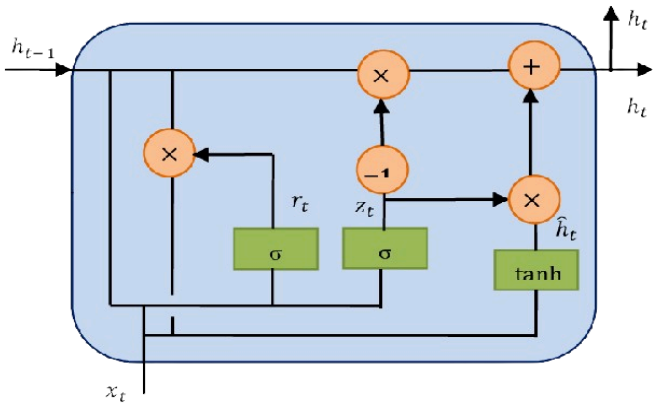

- Used for sequential data, time series dataset
- **Application:** speech recognition, time series prediction
- Vanishing Gradient Problem
- difficulty in capturing long-term dependencies

## 4. LSTM (Long Short-Term Memory)




- Used for sequential data with long-term dependencies
- **Applications:** Speech recognition, time series prediction etc
- More complex than traditional RNNs

## 5. GRU (Gated Recurrent Unit)




- Used for sequential data
- Removed Input, Forget gate concept
- **Application:** Language modeling, speech recognition
- Simpler than LSTMs
- struggle with very long-term dependencies

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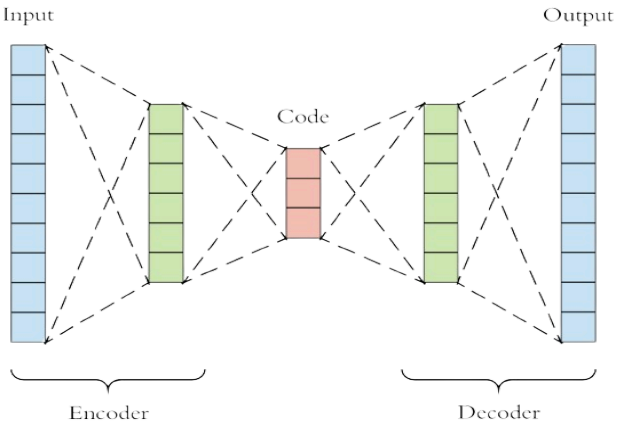
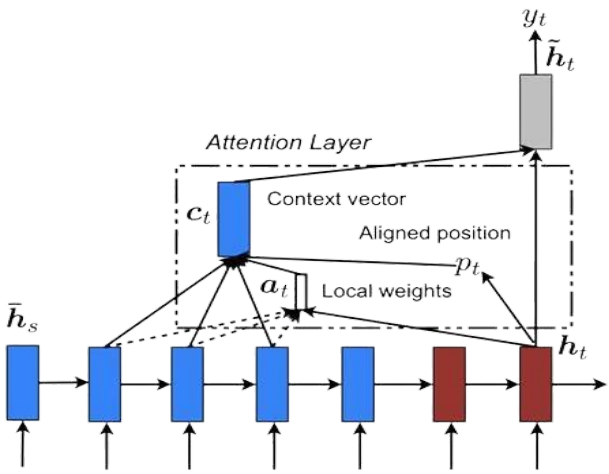
## 6. Encoder & Decoder



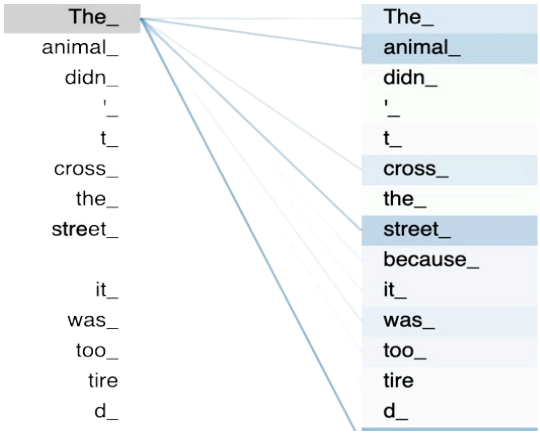

- Used for Sequence-to-sequence tasks
- **Application:** Language translation, image captioning
- Can be used for asynchronized problems
- Fails for sentence length greater than 30

## 7. Attention



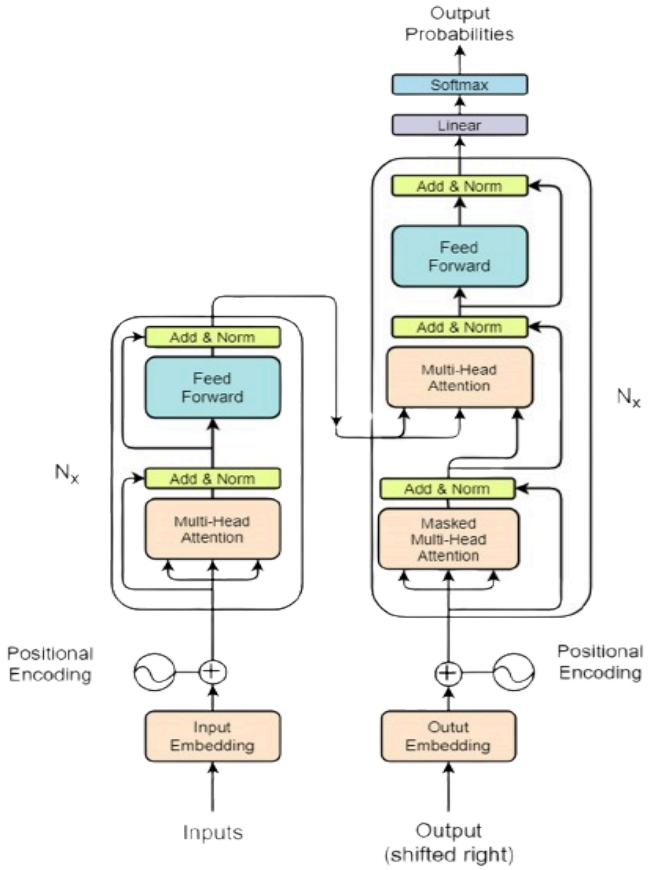

- Used for sequential data
- Focuses on specific parts of the input sequence which are directly related
- **Application:** Improving long-range dependencies in sequence tasks
- increase computational complexity

## 8. Self Attention




- Instead of mapping from input to output, self-attention occurs within the sentence itself.
- **Application:** Language modeling, document summarization
- Increased computational demands

## 9. Transformer




- Used for sequential data, natural language, image data
- **Application:** Machine translation, image classification, language modeling
- Computational demands
- Requires extensive computing resources

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