Date: Day:

Oracle Cloud Infrastructure AI Foundations

AI → Ability to mimic human intelligence

ML → Algorithm to learn from Data and predict

DL → Uses NN to solve complex problems

Supervised → Labels to Data

Unsupervised → Unlabeled

Reinforcement → Rewards/Punish

Machine learning

- Ecommerce
- Netflix
- Spam mail
- Self-driving Cars

(Mapping b/w I/O)

Supervised learning

- Continous → Regression
- Category → Classification
  - Binary
  - Multi-Class

Logistic Regression

- S-shaped Sigmoid

* Independent Feature → I
* Dependant Feature → O
* Difference b/w Actual & Predict Value is called error

Pass ← Output > Threshold

Fail ← " < "

$$Loss = (P - A)^2$$

Date: _____ Day: _____

Machine Learning Process

→ Loading Data → Preprocess → Train → Evaluate → Predict

→ Standardization → mean = 0, S.D = 1 StandardScaler()

→ Validation

(Unsupervised Learning)

↳ Patterns are explored implicitely based on some common feature

Similarity → How close two datasets are to each other

0 —— 1

Prepare → Similarity Metrics → Clustering Algo's → Adjust Clusters

(Reinforcement learning)

↳ Learn from interactions

→ Agent

→ Environment

(RL Training Loop)

→ State → Current Situation

→ Action

→ Policy → Brain / function

Date: _____ Day: _____

Deep Learning

- ANNs
  - Automatically Learn
  - Parallel Process
  - Extract Features on own

(I) → (A.F) → (O)

Back-Propagation Algorithm

Sequence Models

- Paragraph

RNNs → Gradience Issue

- one to one
- one to many
- Many to One
- Many to many

↳ Process one element at a time

LSTM

- Keep long term Dependencies
- Gating Mechanism
  - Input Gate
  - Forget Gate
  - Output Gate

Models

- FNN (Feed Forward Neural Network) → MLP (Multilayer Perceptron)
- CNN (Convolutional Neural Network)
- RNN (Sequential Data)

- Autoencoders
- GAN (Generative Adversial Networks)
- Transformers

Date: Day:

CNN → Convolutional layer
→ Activation Layer
→ Pooling Layer

Limitations
↳ Computation Black Box overfitting

Generative AI & LLM

↳ New content
↳ Model learn on own
↳ Unstructured content

Types
↳ Text Based
↳ Multi-Modal

Transformers
↳ knows about words and relation

LLMs
↳ Probablistic Model of Text
↳ Based on Transformer

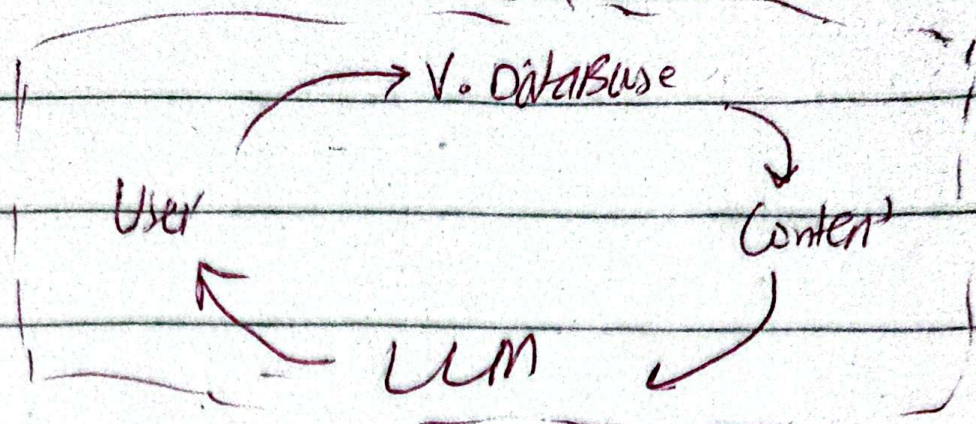
* Encoder
→ Make embedding

* Decoder
→ Always predict single token at a time

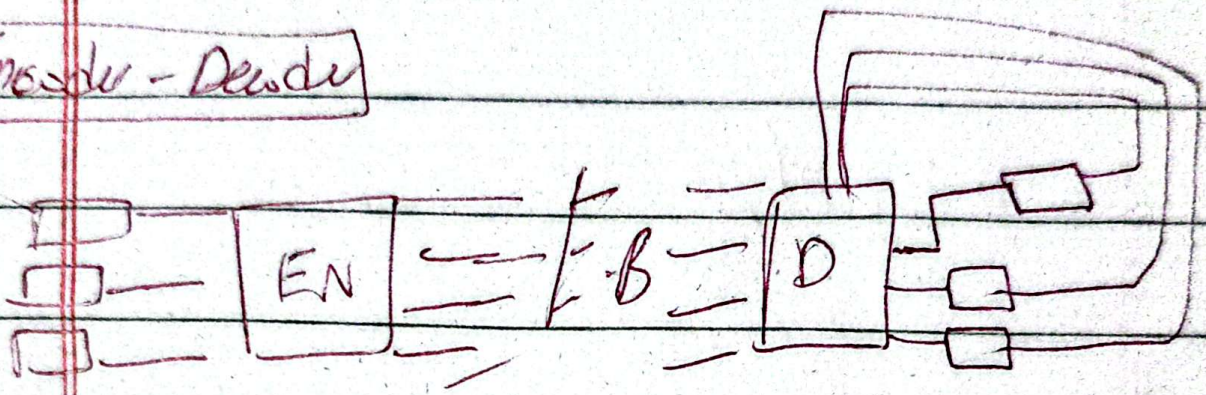
Tokens → word → Punctuation

Embeddings
↳ Numerical Representation

Date: 5th RAG Day:



Encoder - Decoder



Prompt Engineering

→ Instruction Tuning

→ Context Prompt

→ K-Shot Prompt

→ Chain of Thought Prompt

→ Hallucination Issue

(RLHF)

↳ Reinforcement Learning through Human Feedback

Fine tuning & Inference

↳ Smaller & Specific Dataset

OCI AI Services → Vision.

OCI Data Scienc → ML Servic

GPU → Ampere
→ Hopper
↓ → Blackwell
Grace

RDMA (Remote Direct Memory Access) → Super Clusters
↳ Clos Fabric

Vector Search → Oracle ai 23 DataBase