NARESH i®
technologies
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PROMPT ENGINEER

ROADMAP

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1. PROMPT ENGINEER

- What is prompt engineer
- Why to learn prompt Engineering?
- LLM MODEL (LLM) SETTING
- PROMPT ELEMENTS
- PROMPT ENGINEERING TECHNIQUES (SHOT)
- CHAIN OF THOUGHTS (COT) PROMPTING
- SELF CONSISTENCY IN PROMPT ENGINEERING
- Out of date learning IN PROMPT ENGINEERIN
- ROLE PLAYING IN PROMPT ENGINEERING
- RAG IN PROMPT ENGINEERING
- REACT IN PROMPT ENGINEERING
- DSP (Dynamic Structured Prompting)

2. GENERATIVE AI

- Text bases model
- Multimodel
- Clip Architecture
- VQGAN Architecture
- Taming Transformer Architecture
- Autoencoder
- VAE(Variational Auto Encoder)
- RETRIEVAL AUGMENTED GENERATION (RAG)
- HUGGING FACE
- CREW AI
- GROQ
- STABLE DIFFUSION
- GITHUB COPILOT
- LLAMAINDEX
- FAST API

3. LLM MODEL

- **OPEN AI**
  - LANGCHAIN FRAMEWORK
  - OPEN AI WHISPER

- **GOOGLE**
  - GEMINI AI
  - VERTEX AI
  - GOOGLE VISION
- **META**
  - LLAMA3
  - BUILD GENERARTIVE AI ON CLOUD
  - FOUNDATION MODEL
  - FINE TUNE LLM MODEL WITH QUANTIZATION,LORA & QLORA

4. VECTOR DATABASE

- CHROMA DB
- PINECONE
- MILVUS
- QDRANT
- FAISS

5. DEEP LEARNING | NEURAL NETWORK

- Introduction to Neural Network
  Biological and Artificial Neuron
- Introduction to perceptron
  Perceptron and its learning rule and drawbacks
  Multilayer Perceptron, loss function
- Neural Network Activation function
  Training MLP: Backpropagation
- Cost Function
- Gradient Descent Backpropagation - Vanishing and Exploding Gradient Problem

5.1. PYTORCH

- Introduce to Py-torch
- Regularization
- Optmizers
- Hyperparameters and tuning of the same

5.2. TENSORFLOW FRAMEWORK

- Introduction to TensorFlow
- TensorFlow Basic Syntax

- TensorFlow Graphs
- Variables and Placeholders
- TensorFlow Playground

5.3 ANN (Artificial Neural Network)

- ANN Architecture
  - Forward & Backward Propagation, Epoch
  - Introduction to TensorFlow, Keras
- Vanishing Gradient Descend
  - Fine-tuning neural network hyperparameter
  - Number of hidden layers, Number of neurons per hidden layer
  - Activation function
- INSTALLATION OF YOLO V8, KERAS, THEANO

5.4 RNN (Recurrent Neural Network)

- Introduction to RNN
- Back Propagation through time"
  - Input and output sequences
  - RNN vs ANN
  - LSTM (Long Short-Term Memory)
- Different types of RNN: LSTM, GRU
- Biirectional RNN
- Sequential-to-sequential architecture (Encoder Decoder)
- BERT Transformers
- Text generation and classification using Deep Learning
- Generative-AI (Chat-GPT)

5.5. Basics of Image Processing

- Histogram of images
- Basic filters applied on the images

5.6 Convolutional Neural Networks (CNN)

- ImageNet Dataset
- Project: Image Classification
- Different types of CNN architectures
- Recurrent Neural Network (RNN)
- Using pre-trained model: Transfer Learning

6. NAURAL LANGUAGE PROCESSING

- Text Cleaning
- Texts, Tokens
- Basic text classification based on Bag of Words

6.1 Document Vectorization

- Bag of Words
- TF-IDF Vectorizer
- n-gram: Unigram, Bigram
- Word vectorizer basics, One Hot Encoding
- Count Vectorizer
- Word cloud and gensim
- Word2Vec and Glove
- Text classification using Word2Vec and Glove
- Parts of Speech Tagging (PoS Tagging or POST)
- Topic Modelling using LDA
- Sentiment Analysis

6.2 Twitter Sentiment Analysis Using Textblob

1. TextBlob
2. Installing textblob library
3. Simple TextBlob Sentiment Analysis Example
4. Using NLTK's Twitter Corpus

6.3 Spacy Library

- Introduction, What is a Token, Tokenization
- Stop words in spacy library
- Stemming
- Lemmatization,
- Lemmatization through NLTK
- Lemmatization using spacy
- Word Frequency Analysis
- Counter
- Part of Speech, Part of Speech Tagging
- Pos by using spacy and nltk

- Dependency Parsing
- Named Entity Recognition(NER)
- NER with NLTK
- NER with spacy

7. COMPUTER VISION

- **Human vision vs Computer vision**
  - CNN Architecture
  - CONVOLUTION – MAX POOLING – FLATTEN LAYER – FULLY CONNECTED LAYER
  - CNN Architecture
  - Striding and padding
  - Max pooling
  - Data Augmentation
  - Introduction to OpenCV & YoloV3 Algorithm

7.1 Image Processing with OpenCV

- Image basics with OpenCV
  Opening Image Files with OpenCV
- Drawing on Images, Image files with OpenCV
- Face Detection with OpenCV

7.2 Video Processing with OpenCV

- Introduction to Video Basics, Object Detection
- Object Detection with OpenCV

8. PYTHON - DATA TYPES & UTILITIES

- **8.1 List, List of Lists and List Comprehension**
  - List creation
  - Create a list with variable
  - List mutable concept
  - len() || append() || pop()
  - insert() || remove() || sort() || reverse()
  - Forward indexing
  - Backward Indexing
  - Forward slicing
  - Backward slicing
  - Step slicing

- **8.2 Set**
  - SET creation with variable
  - len() || add() || remove() || pop()
  - union() | intersection() || difference()

- **8.3 Tuple**
  - TUPLE Creation
  - Create Tuple with variable
  - Tuple Immutable concept
  - len() || count() || index()
  - Forward indexing
  - Backward Indexing

- **8.4 Dictionary and Dictionary comprehension**
  - create a dictionary using variable
  - keys:values concept
  - len() || keys() || values() || items()
  - get() || pop() || update()
  - comparision of datastructure
  - Introduce to range()
  - pass range() in the list
  - range() arguments
  - For loop introduction using range()

- **8.5 Functions**
  - Inbuilt vs User Defined
  - User Defined Function
  - Function Argument
  - Types of Function Arguments
  - Actual Argument
  - Global variable vs Local variable
  - Anonymous Function | LAMBDA

- **8.6 Packages**

- **8.7 Map Reduce**

9. OOPs

- **9.1 Class & Object**
  - what is mean by inbuild class
  - how to creat user class
  - crate a class & object
  - __init__ method
  - python constructor
  - constructor, self & comparing objects
  - instane variable & class variable
  - Methods:
  - what is instance method
  - what is class method
  - what is static method
  - Accessor & Mutator

- **9.2 Python DECORATOR**
  - how to use decorator
  - inner class, outerclass
  - Inheritence
  - Polymorphism:
  - duck typing
  - operator overloading
  - method overloading & method overridding
  - Magic method
  - Abstract class & Abstract method
  - Iterator
  - Generators in python

- **9.3 Python - Production Level**
  - Error / Exception Handling
  - File Handling
  - Docstrings
  - Modularization