■ My Flashcards

Card 1

■ Question:

What is the drawback of using Diffusion Models for image generation?

■ Answer:

Diffusion Models are slow during generation, require strong GPUs for fast inference, and are harder to use for real-time tasks.

Card 2

■ Question:

What is the benefit of using Diffusion Models for image generation?

■ Answer:

Diffusion Models produce extremely high-quality and detailed images, have stable and predictable training, and great diversity and control over output style.

Card 3

■ **Question:**

What is the drawback of using GANs for image generation?

■ Answer:

GANs have unstable and difficult training, risk of mode collapse, and are not suitable for long-sequence text or reasoning.

Card 4

■ **Question:**

What is the benefit of using GANs for image generation?

■ Answer:

GANs produce sharp, high-quality images, are fast during inference, and are effective for style transfer and image-to-image tasks.

Card 5

■ Question:

What is the drawback of using LLMs for language tasks?

■ Answer:

LLMs are prone to hallucinations, require massive compute for training, and are sensitive to poor or biased training data.

Card 6

■ Question:

What is the benefit of using LLMs for language tasks?

■ Answer:

LLMs are strong at language tasks, handle long context and complex instructions, and support zero-shot, few-shot, and chain-of-thought reasoning.

Card 7

■ Question:

What is the typical use case for chain-of-thought prompting?

■ Answer:

The typical use case for chain-of-thought prompting is math, logic, planning, multiprocess, or multi-step problems.

Card 8

■ Question:

What is the typical use case for few-shot prompting?

■ Answer:

The typical use case for few-shot prompting is niche tasks where zero-shot may confuse the model.

Card 9

■ Question:

What is the typical use case for zero-shot prompting?

■ Answer:

The typical use case for zero-shot prompting is common tasks like translation, classification, summarization, or factual Q&A.;

Card 10

■ Question:

What is the key idea behind chain-of-thought prompting?

■ Answer:

The key idea behind chain-of-thought prompting is that the model explains how it thinks.

Card 11

■ **Question:**

What is the key idea behind few-shot prompting?

■ Answer:

The key idea behind few-shot prompting is that the model imitates the examples provided.

Card 12

■ **Question:**

What is the key idea behind zero-shot prompting?

■ Answer:

The key idea behind zero-shot prompting is that the model understands the task automatically.

Card 13

■ **Question:**

What foundation models are used in Meeting Assistants?

■ Answer:

Meeting Assistants use a Speech Model (e.g., Whisper), an LLM for summarization (e.g., GPT-4), and an embedding model for topic segmentation (e.g., BERT-based).

Card 14

■ **Question:**

What foundation models are used in Speech Systems?

■ Answer:

Speech Systems use a TTS Model + Neural Vocoder (e.g., WaveNet).

Card 15

■ **Question:**

What foundation models are used in Speech Systems?

■ Answer:

Speech Systems use an ASR (Automatic Speech Recognition) Model (e.g., Whisper).

Card 16

■ **Question:**

What foundation models are used in Image Captioning Systems?

■ Answer:

Image Captioning Systems use a vision encoder (e.g., ViT) and a language decoder (e.g., BLIP-2).

Card 17

■ **Question:**

What foundation models are used in RAG Systems?

■ Answer:

RAG Systems use an embedding model (e.g., BERT) and a generative LLM (e.g., GPT-4).

Card 18

■ **Question:**

What are typical use cases for Diffusion Models?

■ Answer:

Typical use cases for Diffusion Models include image generation, video synthesis, design tools, character creation, and animation.

Card 19

■ **Question:**

What are the drawbacks of Diffusion Models?

■ Answer:

Diffusion Models are slow during generation, require strong GPUs for fast inference, and are harder to use for real-time tasks.

Card 20

■ **Question:**

What are the benefits of Diffusion Models?

■ Answer:

Diffusion Models produce extremely high-quality and detailed images, have stable and predictable training, and great diversity and control over output style.

Card 21

■ **Question:**

What are Diffusion Models?

■ Answer:

Diffusion Models are based on the denoising diffusion process and are often combined with text encoders for text-to-image generation.

Card 22

■ **Question:**

What are typical use cases for GANs?

■ Answer:

Typical use cases for GANs include deepfakes, art generation, super-resolution, face synthesis, and style transfer.

Card 23

■ Question:

What are the drawbacks of GANs?

■ Answer:

GANs have unstable and difficult training, risk of mode collapse, and are not suitable for long-sequence text or reasoning.

Card 24

■ Question:

What are the benefits of GANs?

■ Answer:

GANs produce sharp, high-quality images, are fast during inference, and are effective for style transfer and image-to-image tasks.

Card 25

■ Question:

What is GANs (Generative Adversarial Networks)?

■ Answer:

GANs consist of two neural networks trained together: a generator and a discriminator.

Card 26

■ Question:

What are typical use cases for LLMs?

■ Answer:

Typical use cases for LLMs include chatbots, code assistants, RAG, summarization, translation, email writing, and planning.

Card 27

■ Question:

What are the drawbacks of LLMs?

■ Answer:

LLMs are prone to hallucinations, require massive compute for training, and are sensitive to poor or biased training data.

Card 28

■ Question:

What are the benefits of LLMs?

■ Answer:

LLMs are strong at language tasks, handle long context and complex instructions, and support zero-shot, few-shot, and chain-of-thought reasoning.

Card 29

■ **Question:**

What is LLMs (Large Language Models)?

■ Answer:

LLMs are based on the Transformer architecture and use self-attention layers to understand relationships between words.

Card 30

■ **Question:**

What is chain-of-thought prompting?

■ Answer:

Chain-of-thought prompting is a technique that encourages the model to show step-by-step reasoning before giving the final answer.

Card 31

■ **Question:**

What is few-shot prompting?

■ Answer:

Few-shot prompting is a technique where the user provides a few examples showing how the task should be done.

Card 32

■ **Question:**

What is zero-shot prompting?

■ Answer:

Zero-shot prompting is a technique where the model is given only the instruction and must complete the task using its pre-trained knowledge.

Card 33

■ Question:

What is the typical use case of Code Assistants?

■ Answer:

Providing code completion and suggestions based on code context.

Card 34

■ Question:

What is the typical use case of Meeting Assistants?

■ Answer:

Summarizing meeting content and detecting topics, tasks, and action items.

Card 35

■ Question:

What is the typical use case of Speech Systems (TTS)?

■ Answer:

Generating human-like speech from text.

Card 36

■ Question:

What is the typical use case of Speech Systems (STT)?

■ Answer:

Transcribing spoken language into text.

Card 37

■ **Question:**

What is the typical use case of Image Captioning Systems?

■ Answer:

Generating captions for images based on their visual features.

Card 38

■ **Question:**

What is the typical use case of RAG?

■ Answer:

Answering user queries with accurate and relevant information.

Card 39

■ **Question:**

What is the training process of LLMs?

■ Answer:

Trained on large text datasets for language understanding and generation.

Card 40

■ **Question:**

What is the pipeline of LLMs?

■ Answer:

Tokenizer → Embeddings → Multiple Transformer Layers → Next-token prediction.

Card 41

■ Question:

What is the architecture of LLMs?

■ Answer:

Tokenizer → Embeddings → Multiple Transformer Layers → Next-token prediction.

Card 42

■ Question:

What is Code Assistants (Copilot)?

■ Answer:

Analyze code context, predict next lines.

Card 43

■ Question:

What are the foundation models used in Meeting Assistants?

■ Answer:

Speech Model (e.g., Whisper), LLM for summarization (e.g., GPT-4), embedding model for topic segmentation (e.g., BERT-based).

Card 44

■ Question:

What is Meeting Assistants (Zoom AI)?

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 45

■ Question:

What are the foundation models used in Speech Systems (TTS)?

■ Answer:

TTS Model + Neural Vocoder (e.g., WaveNet).

Card 46

■ Question:

What is Speech Systems (TTS – Text-to-Speech)?

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 47

■ **Question:**

What are the foundation models used in Speech Systems (STT)?

■ Answer:

ASR (Automatic Speech Recognition) Model (e.g., Whisper).

Card 48

■ **Question:**

What is Speech Systems (STT – Speech-to-Text)?

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 49

■ **Question:**

What are the foundation models used in Image Captioning Systems?

■ Answer:

Vision Encoder (e.g., ViT) and Language Decoder (e.g., BLIP-2).

Card 50

■ **Question:**

What is Image Captioning Systems?

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 51

■ **Question:**

What are the foundation models used in RAG?

■ Answer:

Embedding Model (e.g., BERT) and Generative LLM (e.g., GPT-4).

Card 52

■ **Question:**

What is RAG (Retrieval-Augmented Generation) Systems?

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, LLM reads the retrieved documents and generates an accurate answer.

Card 53

■ **Question:**

What are the typical use cases of Diffusion Models?

■ Answer:

Image generation (Stable Diffusion, DALL·E), video synthesis, design tools, character creation, animation.

Card 54

■ **Question:**

What are the drawbacks of Diffusion Models?

■ Answer:

Slow generation because of many denoising steps, requires strong GPUs for fast inference, harder to use for real-time tasks.

Card 55

■ Question:

What are the benefits of Diffusion Models?

■ Answer:

Extremely high-quality and detailed images, stable and predictable training process, great diversity and control over output style.

Card 56

■ Question:

What is Diffusion Models?

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 57

■ **Question:**

What are the typical use cases of GANs?

■ Answer:

Deepfakes, art generation, super-resolution, face synthesis, style transfer.

Card 58

■ **Question:**

What are the drawbacks of GANs?

■ Answer:

Training is unstable and difficult to tune, risk of mode collapse, not suitable for long-sequence text or reasoning.

Card 59

■ **Question:**

What are the benefits of GANs?

■ Answer:

Produces sharp, high-quality images, fast generation during inference, effective for style transfer and image-to-image tasks.

Card 60

■ **Question:**

What is GANs (Generative Adversarial Networks)?

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 61

■ Question:

What are the typical use cases of LLMs?

■ Answer:

Chatbots, code assistants, RAG, summarization, translation, email writing, planning.

Card 62

■ Question:

What are the drawbacks of LLMs?

■ Answer:

Hallucinations, needs massive compute for training, sensitive to poor or biased training data.

Card 63

■ **Question:**

What are the benefits of LLMs?

■ Answer:

Strong at language tasks, handles long context and complex instructions, supports zero-shot, few-shot, chain-of-thought reasoning.

Card 64

■ **Question:**

What is LLMs (Large Language Models)?

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 65

■ **Question:**

What is chain-of-thought prompting?

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 66

■ **Question:**

What is few-shot prompting?

■ Answer:

The user provides a few examples showing how the task should be done.

Card 67

■ **Question:**

What is zero-shot prompting?

■ Answer:

The model is given only the instruction and must complete the task using its pre-trained knowledge.

Card 68

■ **Question:**

Define: Code Assistants (Copilot) • How They Work

■ Answer:

o Analyze code context.

Card 69

■ **Question:**

Define: Meeting Assistants (Zoom AI) • How They Work

■ Answer:

o STT model transcribes speech.

Card 70

■ **Question:**

Define: • Foundation Models Used

■ Answer:

o TTS Model + Neural Vocoder ■ Example: WaveNet • Why These Models Are Used:
o Produce natural, expressive speech for dialogue systems.

Card 71

■ **Question:**

Define: • Foundation Models Used

■ Answer:

o ASR (Automatic Speech Recognition) Model ■ Example: Whisper • Why These Models Are Used: o Trained on large audio datasets for accurate transcription.

Card 72

■ **Question:**

Define: • Foundation Models Used

■ Answer:

o Vision Encoder ■ Example: ViT o Language Decoder ■ Example: BLIP-2 • Why These Models Are Used: o Vision encoder understands the image.

Card 73

■ Question:

Define: Image Captioning Systems • How They Work

■ Answer:

o Image → vision encoder extracts features.

Card 74

■ Question:

Define: • Foundation Models Used

■ Answer:

o Embedding Model (general term) ■ Example: BERT o Generative LLM ■ Example: GPT-4 • Why These Models Are Used: o Embedding models understand meaning.

Card 75

■ **Question:**

Define: RAG (Retrieval-Augmented Generation) Systems • How They Work

■ Answer:

o Convert user query into embeddings.

Card 76

■ **Question:**

Define: • Generation

■ Answer:

start from noise → gradually remove noise → final image.

Card 77

■ **Question:**

Define: • Training

■ Answer:

add noise to images in many steps.

Card 78

■ **Question:**

What is Drawbacks • Training?

■ Answer:

unstable and difficult to tune.

Card 79

■ **Question:**

What is o Discriminator – checks if data?

■ Answer:

real or fake.

Card 80

■ **Question:**

Define: • Pipeline

■ Answer:

o Tokenizer → Embeddings → Multiple Transformer Layers → Next-token prediction.

Card 81

■ **Question:**

Define: So total apples = 50." • Key idea

■ Answer:

Model explains how it thinks.

Card 82

■ **Question:**

Define: • Example

■ Answer:

o Prompt: "A shop had 30 apples, then bought 20 more.

Card 83

Define: • Example

■ Answer:

o Prompt: "Translate 'Good morning' into French." o Output: "Bonjour." • Key idea: Model understands the task automatically.

Card 84

What are • No examples or demonstrations?

■ Answer:

provided in the prompt.

Card 85

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

Training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 86

■ **Question:**

Define: * **LLM (Large Language Model)**

■ Answer:

Tokenizer → Embeddings → Multiple Transformer Layers → Next-token prediction.

Card 87

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 88

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate 'Good morning' into French.

Card 89

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation)**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 90

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 91

■ **Question:**

Define: * **GAN (Generative Adversarial Network)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 92

■ **Question:**

Define: * **LLM (Large Language Model)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 93

■ **Question:**

Define: * **Chain-of-thought**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 94

■ **Question:**

Define: * **Few-shot learning**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 95

■ **Question:**

What is **Definitions * **Zero-shot learning**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 96

■ **Question:**

Define: * **Code Assistants**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 97

■ **Question:**

Define: * **Meeting Assistants**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 98

■ **Question:**

Define: * **Speech Systems (TTS – Text-to-Speech)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 99

■ **Question:**

Define: * **Speech Systems (STT – Speech-to-Text)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 100

■ **Question:**

Define: * **Image Captioning Systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 101

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation) Systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 102

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 103

■ Question:

Define: * **GANs (Generative Adversarial Networks)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 104

■ Question:

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 105

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 106

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 107

■ **Question:**

What is **Key Points** * **Zero-shot prompting**: The model?

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 108

■ **Question:**

Define: **Study Summary

■ Answer:

Generative AI** **Introduction** Generative AI refers to a subset of artificial intelligence that enables machines to generate new, original content, such as text, images, or audio.

Card 109

■ Question:

Define: Answer

■ Answer:

b) High-quality and detailed images.

Card 110

■ Question:

What is What?

■ Answer:

the main benefit of using a Diffusion Model?

Card 111

■ Question:

Define: Answer

■ Answer:

c) To create and refine images.

Card 112

■ Question:

What is What?

■ Answer:

the purpose of the Generator and Discriminator in a GAN?

Card 113

■ **Question:**

Define: Answer

■ Answer:

b) Zero-shot uses pre-trained knowledge, few-shot uses examples.

Card 114

■ **Question:**

What is d) Zero-shot?

■ Answer:

used for language tasks, few-shot is used for image tasks.

Card 115

■ Question:

What is c) Zero-shot?

■ Answer:

used for common tasks, few-shot is used for niche tasks.

Card 116

■ Question:

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 117

■ **Question:**

What is * **Transformer architecture**: Encoder: [Embedding Layer → Self-Attention Layer → Feed-Forward Network] * n, Decoder: [Embedding Layer → Self-Attention Layer → Feed-Forward Network] * n, where n?

■ Answer:

the number of layers.

Card 118

■ **Question:**

What are **Equations/Formulas** * **Self-attention mechanism**: Q = K^T * V, where Q, K, and V?

■ Answer:

the query, key, and value vectors, respectively.

Card 119

■ **Question:**

Define: * **Image captioning system**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 120

■ **Question:**

Define: * **RAG system**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 121

■ Question:

Define: * **Chain-of-thought prompting

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 122

■ Question:

Define: * **Few-shot prompting

■ Answer:

Food: Pizza → Category: Fast food, Food: Dosa → Category: South Indian, Task: Food: Sushi → Category: ?

Card 123

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate "Good morning" into French.

Card 124

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

A type of AI model that uses a denoising diffusion process to generate images.

Card 125

■ **Question:**

Define: * **GAN

■ Answer:

A type of AI model that consists of two neural networks trained together: Generator and Discriminator.

Card 126

■ **Question:**

Define: * **LLM

■ Answer:

A type of AI model that uses a Transformer architecture to understand and generate human-like language.

Card 127

■ **Question:**

Define: * **Chain-of-thought**

■ Answer:

A reasoning process that involves breaking down a problem into smaller sub-problems and solving each one step-by-step.

Card 128

■ **Question:**

Define: * **Few-shot learning**

■ Answer:

The ability of a model to learn from a small number of examples.

Card 129

■ **Question:**

Define: **Definitions * **Zero-shot learning****

■ Answer:

The ability of a model to perform a task without any prior examples or training data.

Card 130

■ **Question:**

Define: * **Code assistants**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 131

■ **Question:**

Define: * **Meeting assistants**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 132

■ **Question:**

Define: * **Speech systems (TTS)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 133

■ **Question:**

Define: * **Speech systems (STT)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 134

■ **Question:**

Define: * **Image captioning systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 135

■ **Question:**

Define: * **RAG systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 136

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 137

■ **Question:**

Define: * **GANs**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 138

■ **Question:**

Define: * **LLMs**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 139

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 140

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 141

■ **Question:**

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 142

■ **Question:**

Define: **Study Summary

■ Answer:

Generative AI Models and Applications** **Introduction** Generative AI models have revolutionized the way we interact with technology, enabling applications such as language translation, image generation, and speech synthesis.

Card 143

■ Question:

What are Answer: b) They?

■ Answer:

prone to mode collapse.

Card 144

■ Question:

What are d) They?

■ Answer:

not suitable for long-sequence text or reasoning.

Card 145

■ **Question:**

What are c) They?

■ Answer:

difficult to train and deploy.

Card 146

■ **Question:**

What are b) They?

■ Answer:

prone to mode collapse.

Card 147

■ Question:

What are a) They?

■ Answer:

slow and inefficient.

Card 148

■ Question:

What is What?

■ Answer:

the main drawback of using GANs?

Card 149

■ **Question:**

Define: Answer

■ Answer:

c) They can handle long context and complex instructions.

Card 150

■ **Question:**

What are d) They?

■ Answer:

easy to train and deploy.

Card 151

■ **Question:**

What are b) They?

■ Answer:

accurate and reliable.

Card 152

■ **Question:**

What are a) They?

■ Answer:

fast and efficient.

Card 153

■ Question:

What is What?

■ Answer:

the main benefit of using LLMs?

Card 154

■ Question:

Define: Answer

■ Answer:

a) Zero-shot uses pre-trained knowledge, while few-shot uses examples.

Card 155

■ Question:

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 156

■ Question:

Define: **Equations/ Formulas * **Self-attention layer****

■ Answer:

Q = K^T * V * **Denoising diffusion process**: x_t = x_{t-1} + \epsilon * N(0, I) **Short Quiz** 1.

Card 157

■ **Question:**

Define: * **Image Captioning System**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 158

■ **Question:**

Define: * **RAG System**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 159

■ Question:

Define: * **Chain-of-thought prompting**

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 160

■ Question:

Define: * **Few-shot prompting**

■ Answer:

Food: Pizza → Category: Fast food, Food: Dosa → Category: South Indian, Task: Food: Sushi → Category: ?

Card 161

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate 'Good morning' into French.

Card 162

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

A type of AI model that uses denoising diffusion process to generate new content.

Card 163

■ **Question:**

Define: * **GAN (Generative Adversarial Network)**

■ Answer:

A type of AI model that consists of two neural networks trained together: Generator and Discriminator.

Card 164

■ **Question:**

Define: * **LLM (Large Language Model)**

■ Answer:

A type of AI model that uses self-attention layers to understand relationships between words.

Card 165

■ **Question:**

Define: * **Chain-of-thought learning**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 166

■ **Question:**

Define: * **Few-shot learning**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 167

■ **Question:**

What is **Definitions * **Zero-shot learning**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 168

■ **Question:**

Define: * **Code Assistants (Copilot)**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 169

■ **Question:**

Define: * **Meeting Assistants (Zoom AI)**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 170

■ **Question:**

Define: * **Speech Systems (TTS – Text-to-Speech)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 171

■ **Question:**

Define: * **Speech Systems (STT – Speech-to-Text)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 172

■ **Question:**

Define: * **Image Captioning Systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 173

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation) Systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 174

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 175

■ **Question:**

Define: * **GANs (Generative Adversarial Networks)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 176

■ **Question:**

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 177

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 178

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 179

■ Question:

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 180

■ Question:

Define: **Study Summary

■ Answer:

Generative AI** **Introduction** Generative AI refers to a class of artificial intelligence models that can generate new, original content, such as text, images, or audio.

Card 181

■ Question:

Define: a) Faster generation b) Higher quality images c) More stable training process d) Greater diversity and control over output style Answer

■ Answer:

d) Greater diversity and control over output style

Card 182

■ Question:

What is What?

■ Answer:

the main advantage of Diffusion Models over GANs?

Card 183

■ **Question:**

What is a) To generate fake images b) To check if data?

■ Answer:

real or fake c) To train the Generator d) To evaluate the performance of the GAN Answer: b) To check if data is real or fake 3.

Card 184

■ **Question:**

What is What?

■ Answer:

the purpose of the Discriminator in a GAN?

Card 185

■ **Question:**

Define: Answer

■ Answer:

b) Zero-shot uses pre-trained knowledge, few-shot uses examples.

Card 186

■ **Question:**

What is d) Zero-shot?

■ Answer:

used for image generation, few-shot is used for text generation.

Card 187

■ Question:

What is c) Zero-shot?

■ Answer:

used for common tasks, few-shot is used for niche tasks.

Card 188

■ Question:

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 189

Define: **Examples** * **Zero-shot prompting**

■ Answer:

"Translate 'Good morning' into French." * **Few-shot prompting**: "Food: Pizza → Category: Fast food", "Food: Dosa → Category: South Indian", "Food: Sushi → Category: ?" * **Chain-of-thought prompting**: "A shop had 30 apples, then bought 20 more.

Card 190

■ **Question:**

What is * **Diffusion Model**: A type of AI model that?

■ Answer:

based on the denoising diffusion process and is used for image generation.

Card 191

■ **Question:**

Define: * **GAN (Generative Adversarial Network)**

■ Answer:

A type of AI model that consists of two neural networks trained together: Generator and Discriminator.

Card 192

■ **Question:**

What is * **LLM (Large Language Model): A type of AI model that?**

■ Answer:

trained on large amounts of text data and can generate human-like language.

Card 193

■ **Question:**

Define: * **Chain-of-thought**

■ Answer:

A reasoning process that involves breaking down a problem into smaller sub-problems and solving each one step-by-step.

Card 194

■ **Question:**

Define: * **Few-shot learning**

■ Answer:

The ability of a model to learn from a few examples and perform a task.

Card 195

■ **Question:**

Define: **Definitions * **Zero-shot learning****

■ Answer:

The ability of a model to perform a task without any prior training or examples.

Card 196

■ **Question:**

Define: * **Code Assistants**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 197

■ **Question:**

Define: * **Meeting Assistants**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 198

■ **Question:**

Define: * **Speech Systems (TTS – Text-to-Speech)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 199

■ Question:

Define: * **Speech Systems (STT – Speech-to-Text)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 200

■ Question:

Define: * **Image Captioning Systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 201

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation) Systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, LLM reads the retrieved documents and generates an accurate answer.

Card 202

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 203

■ **Question:**

Define: * **GANs (Generative Adversarial Networks)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 204

■ **Question:**

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 205

■ Question:

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 206

■ Question:

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 207

■ Question:

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 208

■ Question:

Define: **Study Summary

■ Answer:

Generative AI** **Introduction** Generative AI refers to a class of artificial intelligence models that can generate new content, such as text, images, or audio, based on a given prompt or input.

Card 209

■ **Question:**

What is the purpose of semantic tags?

■ Answer:

Semantic tags describe meaning, not just appearance, and make web pages easier to read, maintain, and index by search engines.

Card 210

■ **Question:**

What is the difference between inline and external CSS?

■ Answer:

Inline CSS is used to style a single element, while external CSS is used to style multiple elements.

Card 211

■ **Question:**

What is the purpose of JavaScript?

■ Answer:

JavaScript is a programming language used to add interactivity to web pages.

Card 212

■ **Question:**

What is the purpose of CSS?

■ Answer:

CSS is a styling language used to control the layout and appearance of web pages.

Card 213

■ **Question:**

What is the purpose of HTML5 documents?

■ Answer:

HTML5 documents have a standard structure that tells the browser how to display content.

Card 214

■ **Question:**

What is the main difference between Machine Learning and Deep Learning?

■ Answer:

Machine Learning uses algorithms, while Deep Learning uses neural networks.

Card 215

■ **Question:**

What is the main difference between GET and POST HTTP request methods?

■ Answer:

GET is used to retrieve data from the server, while POST is used to send data to the server.

Card 216

■ **Question:**

What is the purpose of semantic tags?

■ Answer:

Semantic tags describe meaning, not just appearance, and make web pages easier to read, maintain, and index by search engines.

Card 217

■ **Question:**

What is the difference between inline and external CSS?

■ Answer:

Inline CSS is used to style a single element, while external CSS is used to style multiple elements.

Card 218

■ **Question:**

What is the purpose of JavaScript?

■ Answer:

JavaScript is a programming language used to add interactivity to web pages.

Card 219

■ Question:

What is the purpose of CSS?

■ Answer:

CSS is a styling language used to control the layout and appearance of web pages.

Card 220

■ Question:

What is the purpose of HTML5 documents?

■ Answer:

HTML5 documents have a standard structure that tells the browser how to display content.

Card 221

■ **Question:**

What is the main difference between Machine Learning and Deep Learning?

■ Answer:

Machine Learning uses algorithms, while Deep Learning uses neural networks.

Card 222

■ **Question:**

What is the main difference between GET and POST HTTP request methods?

■ Answer:

GET is used to retrieve data from the server, while POST is used to send data to the server.

Card 223

■ Question:

What is the purpose of semantic tags?

■ Answer:

Semantic tags describe meaning, not just appearance, and make web pages easier to read, maintain, and index by search engines.

Card 224

■ Question:

What is the difference between inline and external CSS?

■ Answer:

Inline CSS is used to style a single element, while external CSS is used to style multiple elements.

Card 225

■ Question:

What is the purpose of JavaScript?

■ Answer:

JavaScript is a programming language used to add interactivity to web pages.

Card 226

■ Question:

What is the purpose of CSS?

■ Answer:

CSS is a styling language used to control the layout and appearance of web pages.

Card 227

■ **Question:**

What is the purpose of HTML5 documents?

■ Answer:

HTML5 documents have a standard structure that tells the browser how to display content.

Card 228

■ **Question:**

What is the main difference between Machine Learning and Deep Learning?

■ Answer:

Machine Learning uses algorithms, while Deep Learning uses neural networks.

Card 229

■ **Question:**

What is the main difference between GET and POST HTTP request methods?

■ Answer:

GET is used to retrieve data from the server, while POST is used to send data to the server.

Card 230

■ **Question:**

What is the purpose of semantic tags?

■ Answer:

Semantic tags describe meaning, not just appearance, and make web pages easier to read, maintain, and index by search engines.

Card 231

■ **Question:**

What is the difference between inline and external CSS?

■ Answer:

Inline CSS is used to style a single element, while external CSS is used to style multiple elements.

Card 232

■ **Question:**

What is the purpose of JavaScript?

■ Answer:

JavaScript is a programming language used to add interactivity to web pages.

Card 233

■ **Question:**

What is the purpose of CSS?

■ Answer:

CSS is a styling language used to control the layout and appearance of web pages.

Card 234

■ **Question:**

What is the purpose of HTML5 documents?

■ Answer:

HTML5 documents have a standard structure that tells the browser how to display content.

Card 235

■ **Question:**

What is the main difference between Machine Learning and Deep Learning?

■ Answer:

Machine Learning uses algorithms, while Deep Learning uses neural networks.

Card 236

■ **Question:**

What is the main difference between GET and POST HTTP request methods?

■ Answer:

GET is used to retrieve data from the server, while POST is used to send data to the server.

Card 237

■ **Question:**

What is the purpose of semantic tags in HTML5?

■ Answer:

Semantic tags describe meaning, not just appearance, and make web pages easier to read, maintain, and index by search engines.

Card 238

■ **Question:**

What is Generative AI?

■ Answer:

Generative AI models learn patterns from data and create new content that looks similar to what they learned.

Card 239

■ **Question:**

What is Cognitive Computing?

■ Answer:

Cognitive Computing tries to imitate human thought processes and can understand natural language, reason, and give human-like responses.

Card 240

■ **Question:**

What is Deep Learning?

■ Answer:

Deep Learning is a special type of Machine Learning that uses neural networks with many layers to automatically learn complex patterns.

Card 241

■ Question:

What is Machine Learning?

■ Answer:

Machine Learning uses algorithms that learn patterns from data and make predictions.

Card 242

■ Question:

What is the main use of Code Assistants?

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 243

■ **Question:**

What is the main use of Meeting Assistants?

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 244

■ **Question:**

What is the main use of STT-TTS?

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 245

■ **Question:**

What is the main use of Image Captioning Systems?

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 246

■ **Question:**

What is the main use of RAG Systems?

■ Answer:

Convert user query into embeddings, retrieve relevant documents, and generate an accurate answer.

Card 247

■ **Question:**

What is the main use of Diffusion Models?

■ Answer:

Image generation (Stable Diffusion, DALL·E), video synthesis, design tools, character creation, animation.

Card 248

■ **Question:**

What is the main use of GANs?

■ Answer:

Produces sharp, high-quality images.

Card 249

■ Question:

What is the main use of LLMs?

■ Answer:

Strong at language tasks (reasoning, coding, summarization).

Card 250

■ Question:

What is the main difference between zero-shot and few-shot prompting?

■ Answer:

Zero-shot is used for common tasks, while few-shot is used for niche tasks.

Card 251

■ Question:

What is the main use of Code Assistants?

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 252

■ Question:

What is the main use of Meeting Assistants?

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 253

■ **Question:**

What is the main use of STT-TTS?

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 254

■ **Question:**

What is the main use of Image Captioning Systems?

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 255

■ **Question:**

What is the main use of RAG Systems?

■ Answer:

Convert user query into embeddings, retrieve relevant documents, and generate an accurate answer.

Card 256

■ **Question:**

What is the main use of Diffusion Models?

■ Answer:

Image generation (Stable Diffusion, DALL·E), video synthesis, design tools, character creation, animation.

Card 257

■ **Question:**

What is the main use of GANs?

■ Answer:

Produces sharp, high-quality images.

Card 258

■ **Question:**

What is the main use of LLMs?

■ Answer:

Strong at language tasks (reasoning, coding, summarization).

Card 259

■ **Question:**

What is the main difference between zero-shot and few-shot prompting?

■ Answer:

Zero-shot is used for common tasks, while few-shot is used for niche tasks.

Card 260

■ **Question:**

What is the main use of Code Assistants?

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 261

■ **Question:**

What is Code Assistants (Copilot)?

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 262

■ **Question:**

What is the main use of Meeting Assistants?

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 263

■ **Question:**

What is Meeting Assistants (Zoom AI)?

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 264

■ **Question:**

What is the main use of STT-TTS?

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 265

■ **Question:**

What is STT-TTS?

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 266

■ **Question:**

What is the main use of Image Captioning Systems?

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 267

■ **Question:**

What is Image Captioning Systems?

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 268

■ **Question:**

What is the main use of RAG Systems?

■ Answer:

Convert user query into embeddings, retrieve relevant documents, and generate an accurate answer.

Card 269

■ **Question:**

What is RAG (Retrieval-Augmented Generation) Systems?

■ Answer:

Convert user query into embeddings, retrieve relevant documents, and generate an accurate answer.

Card 270

■ **Question:**

What is the main use of Diffusion Models?

■ Answer:

Image generation (Stable Diffusion, DALL·E), video synthesis, design tools, character creation, animation.

Card 271

■ **Question:**

What are Diffusion Models?

■ Answer:

Based on denoising diffusion process.

Card 272

■ **Question:**

What is the main use of GANs?

■ Answer:

Produces sharp, high-quality images.

Card 273

■ Question:

What is GANs (Generative Adversarial Networks)?

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 274

■ Question:

What is the main use of LLMs?

■ Answer:

Strong at language tasks (reasoning, coding, summarization).

Card 275

■ **Question:**

What is LLMs (Large Language Models)?

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 276

■ **Question:**

What is the purpose of chain-of-thought prompting?

■ Answer:

Reduces errors by forcing the model to reason clearly.

Card 277

■ **Question:**

What is chain-of-thought prompting?

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 278

■ **Question:**

What is few-shot prompting?

■ Answer:

The user provides a few examples showing how the task should be done.

Card 279

■ **Question:**

What is the main difference between zero-shot and few-shot prompting?

■ Answer:

Zero-shot is used for common tasks, while few-shot is used for niche tasks.

Card 280

■ **Question:**

What is zero-shot prompting?

■ Answer:

The model is given only the instruction and must complete the task using its pre-trained knowledge.

Card 281

■ **Question:**

Define: Answer

■ Answer:

b) They produce high-quality and detailed images.

Card 282

■ **Question:**

What are d) They?

■ Answer:

easy to use.

Card 283

■ **Question:**

What are c) They?

■ Answer:

stable and predictable.

Card 284

■ **Question:**

What are a) They?

■ Answer:

fast and efficient.

Card 285

■ Question:

What is What?

■ Answer:

the main advantage of Diffusion Models?

Card 286

■ Question:

Define: Answer

■ Answer:

a) To generate new images.

Card 287

■ **Question:**

What is What?

■ Answer:

the purpose of the generator in a GAN?

Card 288

■ **Question:**

Define: Answer

■ Answer:

a) Zero-shot uses pre-trained knowledge, while few-shot uses examples.

Card 289

■ **Question:**

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 290

■ **Question:**

What is * **Diffusion Model architecture: x_t = x_{t-1} + \epsilon * \sigma^{-1} (x_{t-1} - x_{t-2}), where x_t?**

■ Answer:

the output at time t, \epsilon is the noise vector, and \sigma is the standard deviation.

Card 291

■ **Question:**

What is * **GAN architecture**: G(z) = x, where G?

■ Answer:

the generator and z is the input noise vector.

Card 292

■ **Question:**

What are **Equations/Formulas** * **Transformer architecture**: Q = K^T * V, where Q, K, and V?

■ Answer:

the query, key, and value vectors.

Card 293

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

Generate a new image of a landscape.

Card 294

■ **Question:**

Define: * **GAN**

■ Answer:

Generate a new image of a cat.

Card 295

Define: * **LLM**

■ Answer:

Translate "Hello" into Spanish.

Card 296

■ Question:

Define: * **Chain-of-thought prompting**

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 297

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

Food: Pizza → Category: Fast food, Food: Dosa → Category: South Indian, Task: Food: Sushi → Category: ?

Card 298

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate "Good morning" into French.

Card 299

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

A type of Generative AI model based on denoising diffusion process.

Card 300

■ **Question:**

Define: * **GAN (Generative Adversarial Network)**

■ Answer:

A type of Generative AI model that consists of two neural networks trained together.

Card 301

■ **Question:**

Define: * **LLM (Large Language Model)**

■ Answer:

A type of Generative AI model based on Transformer architecture.

Card 302

■ **Question:**

Define: * **Chain-of-thought**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 303

■ Question:

Define: * **Few-shot**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 304

■ Question:

What is **Definitions** * **Zero-shot**: The model?

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 305

■ **Question:**

Define: * **Code Assistants (Copilot)**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 306

■ **Question:**

Define: * **Meeting Assistants (Zoom AI)**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 307

■ **Question:**

Define: * **Speech Systems (TTS – Text-to-Speech)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 308

■ **Question:**

Define: * **Speech Systems (STT – Speech-to-Text)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 309

■ **Question:**

Define: * **Image Captioning Systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 310

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation) Systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 311

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 312

■ **Question:**

Define: * **GANs (Generative Adversarial Networks)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 313

■ **Question:**

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 314

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 315

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 316

■ **Question:**

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 317

■ Question:

Define: **Study Summary

■ Answer:

Generative AI** **Introduction** Generative AI refers to a subset of artificial intelligence that enables machines to generate new, original content, such as text, images, or audio.

Card 318

■ Question:

Define: * **Meeting assistant**

■ Answer:

Use speech model to transcribe speech, LLM to summarize meeting content, and embedding model to detect topics, tasks, and action items.

Card 319

■ **Question:**

Define: * **Speech system**

■ Answer:

Use speech encoder to recognize phonemes and words, and use decoder to generate text output.

Card 320

■ **Question:**

Define: * **Image captioning system**

■ Answer:

Use vision encoder to extract features from an image, and use language decoder to generate captions.

Card 321

■ **Question:**

Define: **Examples** * **RAG system**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and use LLM to generate accurate answers.

Card 322

■ **Question:**

Define: * **Code assistant**

■ Answer:

A type of AI system that uses code-specific LLMs to analyze code context and predict next lines or entire functions.

Card 323

■ Question:

Define: * **Meeting assistant**

■ Answer:

A type of AI system that uses a combination of speech models, LLMs, and embedding models to summarize meeting content.

Card 324

■ Question:

Define: * **Speech system**

■ Answer:

A type of AI system that uses a combination of speech encoders and decoders to generate text output.

Card 325

■ Question:

Define: * **Image captioning system**

■ Answer:

A type of AI system that uses a combination of vision encoders and language decoders to generate captions.

Card 326

■ Question:

Define: **Definitions * **RAG system****

■ Answer:

A type of AI system that uses a combination of embedding models and LLMs to generate accurate answers.

Card 327

■ Question:

Define: * **Code assistants**

■ Answer:

Use code-specific LLMs to analyze code context and predict next lines or entire functions.

Card 328

■ Question:

Define: * **Meeting assistants**

■ Answer:

Use a combination of speech models, LLMs, and embedding models to summarize meeting content.

Card 329

■ **Question:**

Define: * **Speech systems**

■ Answer:

Use a combination of speech encoders and decoders to generate text output.

Card 330

■ **Question:**

Define: * **Image captioning systems**

■ Answer:

Use a combination of vision encoders and language decoders to generate captions.

Card 331

■ Question:

Define: **Key Points * **RAG systems****

■ Answer:

Use a combination of embedding models and LLMs to generate accurate answers.

Card 332

■ Question:

Define: **Mod 4

■ Answer:

Generative AI Applications** **Introduction** Generative AI has a wide range of applications, including image captioning, RAG systems, meeting assistants, speech systems, and code assistants.

Card 333

■ **Question:**

Define: Answer

■ Answer:

a) Slow generation because of many denoising steps.

Card 334

■ **Question:**

What is What?

■ Answer:

the main drawback of using Diffusion Models?

Card 335

■ **Question:**

Define: Answer

■ Answer:

a) Produces sharp, high-quality images.

Card 336

■ **Question:**

What is What?

■ Answer:

the main benefit of using GANs?

Card 337

■ **Question:**

Define: Answer

■ Answer:

b) Zero-shot uses pre-trained knowledge, few-shot uses examples.

Card 338

■ **Question:**

What is c) Zero-shot?

■ Answer:

used for common tasks, few-shot is used for niche tasks.

Card 339

■ Question:

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 340

■ Question:

What is * **Generator-Discriminator architecture: G(z) → D(G(z)), where G?**

■ Answer:

the Generator and D is the Discriminator.

Card 341

■ **Question:**

What is **Equations/ Formulas** * **Self-attention mechanism**: Q = K^T * V, where Q?

■ Answer:

the query, K is the key, and V is the value.

Card 342

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 343

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

Food: Pizza → Category: Fast food, Food: Dosa → Category: South Indian, Task: Food: Sushi → Category: ?

Card 344

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate "Good morning" into French.

Card 345

■ Question:

Define: * **Diffusion Model**

■ Answer:

A type of AI model that uses a denoising diffusion process to generate images.

Card 346

■ Question:

Define: * **GAN**

■ Answer:

A type of AI model that consists of two neural networks trained together: Generator and Discriminator.

Card 347

■ **Question:**

Define: * **LLM**

■ Answer:

A type of AI model that uses self-attention mechanisms to understand relationships between words.

Card 348

■ **Question:**

Define: * **Chain-of-thought**

■ Answer:

A reasoning process that involves breaking down a problem into smaller sub-problems and solving each one step-by-step.

Card 349

■ Question:

Define: * **Few-shot learning**

■ Answer:

The ability of a model to learn a task with only a few examples.

Card 350

■ Question:

Define: **Definitions * **Zero-shot learning****

■ Answer:

The ability of a model to perform a task without any prior training on that task.

Card 351

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 352

■ **Question:**

Define: * **GANs (Generative Adversarial Networks)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 353

■ **Question:**

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 354

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 355

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 356

■ **Question:**

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 357

■ **Question:**

Define: **Structured Study Summary **Mod 2**

■ Answer:

Generative AI Fundamentals** **Introduction** Generative AI refers to a class of artificial intelligence models that can generate new content, such as text, images, or audio, based on a given prompt or input.

Card 358

■ **Question:**

Define: Answer

■ Answer:

a) Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 359

■ Question:

What is What?

■ Answer:

the main application of a Code Assistant?

Card 360

■ Question:

Define: Answer

■ Answer:

b) Extremely high-quality and detailed images.

Card 361

■ **Question:**

What is What?

■ Answer:

the main benefit of using a Diffusion Model?

Card 362

■ **Question:**

Define: Answer

■ Answer:

a) Zero-shot uses pre-trained knowledge, few-shot uses examples.

Card 363

■ Question:

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 364

■ Question:

Define: **Equations/Formulas * **Self-attention layer****

■ Answer:

Q = K^T * V / sqrt(d) * **Generator**: G(z) = σ(Wz + b) * **Discriminator**: D(x) = σ(Wx + b) **Short Quiz** 1.

Card 365

■ **Question:**

Define: * **Diffusion Model

■ Answer:

Generate a new image of a landscape.

Card 366

■ **Question:**

Define: * **GAN

■ Answer:

Generate a new image of a cat.

Card 367

■ Question:

Define: * **LLM**

■ Answer:

Translate a sentence from English to Spanish.

Card 368

■ Question:

Define: * **Chain-of-thought prompting**

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 369

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

Food: Pizza → Category: Fast food, Food: Dosa → Category: South Indian, Task: Food: Sushi → Category: ?

Card 370

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate "Good morning" into French.

Card 371

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

A type of AI model that uses denoising diffusion process to generate new content.

Card 372

■ **Question:**

Define: * **GAN (Generative Adversarial Network)**

■ Answer:

A type of AI model that consists of two neural networks trained together: Generator and Discriminator.

Card 373

■ **Question:**

Define: * **LLM (Large Language Model)**

■ Answer:

A type of AI model that uses self-attention layers to understand relationships between words.

Card 374

■ **Question:**

Define: * **Chain-of-thought**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 375

■ Question:

Define: * **Few-shot learning**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 376

■ Question:

What is **Definitions * **Zero-shot learning**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 377

■ **Question:**

Define: * **Code Assistants**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 378

■ **Question:**

Define: * **Meeting Assistants**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 379

■ **Question:**

Define: * **Speech Systems (TTS – Text-to-Speech)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 380

■ **Question:**

Define: * **Speech Systems (STT – Speech-to-Text)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 381

■ **Question:**

Define: * **Image Captioning Systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 382

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation) Systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 383

■ **Question:**

Define: * **Diffusion Models

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 384

■ **Question:**

Define: * **GANs (Generative Adversarial Networks)

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 385

■ **Question:**

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 386

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 387

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 388

■ **Question:**

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 389

■ Question:

Define: **Study Summary

■ Answer:

Generative AI** **Introduction** Generative AI refers to a class of artificial intelligence (AI) models that can generate new, original content, such as text, images, or audio.

Card 390

■ Question:

Define: Answer

■ Answer:

a) They can generate high-quality images.

Card 391

■ **Question:**

What is What?

■ Answer:

the main advantage of Diffusion Models over other Generative AI models?

Card 392

■ **Question:**

Define: Answer

■ Answer:

a) To generate new content.

Card 393

■ Question:

What is b) To check if the generated content?

■ Answer:

real or fake.

Card 394

■ Question:

What is What?

■ Answer:

the purpose of the Generator in a GAN?

Card 395

■ Question:

Define: Answer

■ Answer:

a) Zero-shot uses pre-trained knowledge, while few-shot uses examples.

Card 396

■ Question:

What is What?

■ Answer:

the main difference between zero-shot and few-shot prompting?

Card 397

■ **Question:**

What is * **Generator-Discriminator architecture: Generator: x →
G(x), Discriminator: x → D(x), where x?**

■ Answer:

the input data.

Card 398

■ **Question:**

What are **Equations/Formulas * **Self-attention layer**: Q = K^T
* V, where Q, K, and V?**

■ Answer:

the query, key, and value vectors.

Card 399

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

Generate high-quality images, create videos, or produce 3D models.

Card 400

■ **Question:**

Define: * **GAN**

■ Answer:

Generate realistic images, create art, or produce music.

Card 401

■ **Question:**

Define: * **LLM**

■ Answer:

Translate text from one language to another, summarize long documents, or generate code.

Card 402

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

A shop had 30 apples, then bought 20 more.

Card 403

Define: * **Few-shot prompting**

■ Answer:

Food: Pizza → Category: Fast food, Food: Dosa → Category: South Indian, Task: Food: Sushi → Category: ?

Card 404

■ **Question:**

Define: **Examples * **Zero-shot prompting****

■ Answer:

Translate 'Good morning' into French.

Card 405

■ **Question:**

Define: * **Diffusion Model**

■ Answer:

A type of AI model that uses denoising diffusion process to generate new content.

Card 406

■ **Question:**

Define: * **GAN (Generative Adversarial Network)**

■ Answer:

A type of AI model that consists of two neural networks trained together: Generator and Discriminator.

Card 407

■ **Question:**

Define: * **LLM (Large Language Model)**

■ Answer:

A type of AI model that uses self-attention layers to understand relationships between words.

Card 408

■ **Question:**

Define: * **Chain-of-thought learning**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 409

■ **Question:**

Define: * **Few-shot learning**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 410

■ **Question:**

What is **Definitions * **Zero-shot learning**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 411

■ Question:

Define: * **Code Assistants (Copilot)**

■ Answer:

Analyze code context, predict next lines or entire functions, fix errors and generate documentation.

Card 412

■ Question:

Define: * **Meeting Assistants (Zoom AI)**

■ Answer:

STT model transcribes speech, LLM summarizes meeting content, embedding model detects topics, tasks, and action items.

Card 413

■ **Question:**

Define: * **Speech Systems (TTS – Text-to-Speech)**

■ Answer:

Convert text → phonemes → acoustic representation, neural vocoder generates human-like audio.

Card 414

■ **Question:**

Define: * **Speech Systems (STT – Speech-to-Text)**

■ Answer:

Convert audio waveform into spectrogram, speech encoder recognizes phonemes and words, decoder generates text output.

Card 415

■ **Question:**

Define: * **Image Captioning Systems**

■ Answer:

Image → vision encoder extracts features, text decoder converts visual features to words.

Card 416

■ **Question:**

Define: * **RAG (Retrieval-Augmented Generation) Systems**

■ Answer:

Convert user query into embeddings, retrieve relevant documents from a vector database, and LLM reads the retrieved documents and generates an accurate answer.

Card 417

■ **Question:**

Define: * **Diffusion Models**

■ Answer:

Based on denoising diffusion process, training: add noise to images in many steps, generation: start from noise → gradually remove noise → final image.

Card 418

■ **Question:**

Define: * **GANs (Generative Adversarial Networks)**

■ Answer:

Consists of two neural networks trained together: Generator and Discriminator.

Card 419

■ **Question:**

Define: * **LLMs (Large Language Models)**

■ Answer:

Based on Transformer architecture, uses self-attention layers to understand relationships between words.

Card 420

■ **Question:**

Define: * **Chain-of-thought prompting**

■ Answer:

Encourages the model to show step-by-step reasoning before giving the final answer.

Card 421

■ **Question:**

Define: * **Few-shot prompting**

■ Answer:

The user provides a few examples showing how the task should be done.

Card 422

■ **Question:**

What is **Key Points * **Zero-shot prompting**: The model?**

■ Answer:

given only the instruction and must complete the task using its pre-trained knowledge.

Card 423

■ **Question:**

Define: **Structured Study Summary

■ Answer:

Generative AI** **Introduction** Generative AI refers to a class of artificial intelligence models that can generate new, original content, such as text, images, or audio.

Card 424

■ **Question:**

a) Creates new text, images, or audio b) Learns patterns from large datasets c) Responds creatively to prompts d) All of the above Answer: d) All of the above

■ Answer:

Recall details / explanation: a) Creates new text, images, or audio b) Learns patterns from large datasets c) Responds creatively to prompts d) All of the above Answer: d) All of the above

Card 425

■ Question:

What is the key feature of Generative AI systems?

■ Answer:

Recall details / explanation: What is the key feature of Generative AI systems?

Card 426

■ Question:

a) Changes colors, fonts, sizes, and alignment b) Modifies request or response c) Decides which function runs for a given URL d) Indicates the status of a request Answer: a) Changes colors, fonts, sizes, and alignment 3.

■ Answer:

Recall details / explanation: a) Changes colors, fonts, sizes, and alignment b) Modifies request or response c) Decides which function runs for a given URL d) Indicates the status of a request Answer: a) Changes colors, fonts, sizes, and alignment 3.

Card 427

■ **Question:**

What is the role of CSS in improving webpage appearance?

■ Answer:

Recall details / explanation: What is the role of CSS in improving webpage appearance?

Card 428

■ **Question:**

a) Face recognition on smartphones b) Image captioning c) Text-to-image prompts d) Prompt engineering Answer: a) Face recognition on smartphones 2.

■ Answer:

Recall details / explanation: a) Face recognition on smartphones b) Image captioning c) Text-to-image prompts d) Prompt engineering Answer: a) Face recognition on smartphones 2.

Card 429

■ **Question:**

What is the everyday use of computer vision in modern systems?

■ Answer:

Recall details / explanation: What is the everyday use of computer vision in modern systems?

Card 430

■ **Question:**

Key Points * **Mod 2** + Everyday use of computer vision: face recognition on smartphones + Retrieval-Augmented Generation (RAG): combines retrieval and generation to improve accuracy + Text-to-text prompts: input text → output text (e.g., answers, summaries) + Text-to-image prompts: input text → output image (e.g., pictures or illustrations) + Prompt engineering: designing clear and specific prompts to improve AI results + AI-assisted software testing: automates finding bugs in softw...

■ Answer:

Recall details / explanation: **Key Points** * **Mod 2** + Everyday use of computer vision: face recognition on smartphones + Retrieval-Augmented Generation (RAG): combines retrieval and generation to improve accuracy + Text-to-text prompts: input text → output text (e.g., answers, summaries) + Text-to-image prompts: input text → output image (e.g., pictures or illustrations) + Prompt engineering: designing clear and specific prompts to improve AI results + AI-assisted software testing: automates finding bugs in software + Generative AI: creates new text, images, or audio from patterns learned from large datasets * **Mod 3** + Semantic elements in HTML5: , , , + Role of CSS in improving webpage appearance: changes colors, fonts, sizes, and align...