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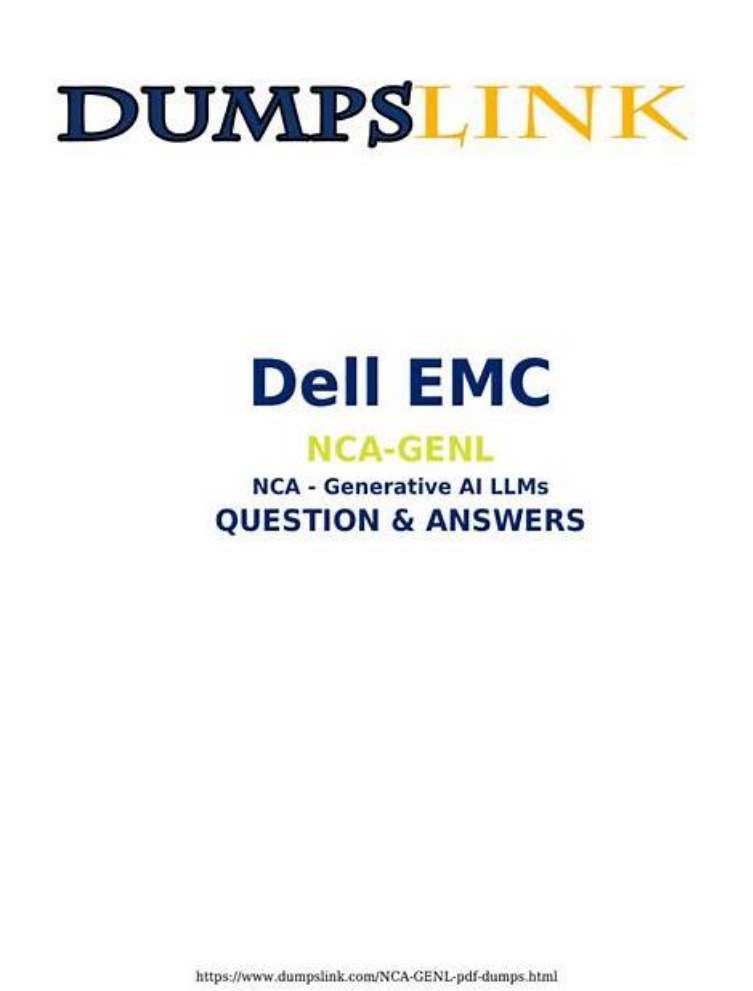

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NVIDIA NCA-GENL Exam Syllabus Topics:

Topic	Details
Topic 1	• LLM Integration and Deployment: This section of the exam measures skills of AI Platform Engineers and covers connecting LLMs with applications or services through APIs, and deploying them securely and efficiently at scale. It also includes considerations for latency, cost, monitoring, and updates in production environments.
Topic 2	• Data Preprocessing and Feature Engineering: This section of the exam measures the skills of Data Engineers and covers preparing raw data into usable formats for model training or fine-tuning. It includes cleaning, normalizing, tokenizing, and feature extraction methods essential to building robust LLM pipelines.
Topic 3	• Python Libraries for LLMs: This section of the exam measures skills of LLM Developers and covers using Python tools and frameworks like Hugging Face Transformers, LangChain, and PyTorch to build, fine-tune, and deploy large language models. It focuses on practical implementation and ecosystem familiarity.

Topic 4	• This section of the exam measures skills of AI Product Developers and covers how to strategically plan experiments that validate hypotheses, compare model variations, or test model responses. It focuses on structure, controls, and variables in experimentation.
Topic 5	• Prompt Engineering: This section of the exam measures the skills of Prompt Designers and covers how to craft effective prompts that guide LLMs to produce desired outputs. It focuses on prompt strategies, formatting, and iterative refinement techniques used in both development and real-world applications of LLMs.
Topic 6	• Software Development: This section of the exam measures the skills of Machine Learning Developers and covers writing efficient, modular, and scalable code for AI applications. It includes software engineering principles, version control, testing, and documentation practices relevant to LLM-based development.
Topic 7	• Experimentation: This section of the exam measures the skills of ML Engineers and covers how to conduct structured experiments with LLMs. It involves setting up test cases, tracking performance metrics, and making informed decisions based on experimental outcomes.:
Topic 8	• Fundamentals of Machine Learning and Neural Networks: This section of the exam measures the skills of AI Researchers and covers the foundational principles behind machine learning and neural networks, focusing on how these concepts underpin the development of large language models (LLMs). It ensures the learner understands the basic structure and learning mechanisms involved in training generative AI systems.
Topic 9	• Data Analysis and Visualization: This section of the exam measures the skills of Data Scientists and covers interpreting, cleaning, and presenting data through visual storytelling. It emphasizes how to use visualization to extract insights and evaluate model behavior, performance, or training data patterns.
Topic 10	• Alignment: This section of the exam measures the skills of AI Policy Engineers and covers techniques to align LLM outputs with human intentions and values. It includes safety mechanisms, ethical safeguards, and tuning strategies to reduce harmful, biased, or inaccurate results from models.

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NVIDIA Generative AI LLMs Sample Questions (Q19-Q24):

NEW QUESTION # 19
In transformer-based LLMs, how does the use of multi-head attention improve model performance compared to single-head attention, particularly for complex NLP tasks?

- A. Multi-head attention allows the model to focus on multiple aspects of the input sequence simultaneously.
- B. Multi-head attention reduces the model's memory footprint by sharing weights across heads.
- C. Multi-head attention simplifies the training process by reducing the number of parameters.
- D. Multi-head attention eliminates the need for positional encodings in the input sequence.

Answer: A

Explanation:
Multi-head attention, a core component of the transformer architecture, improves model performance by allowing the model to attend to multiple aspects of the input sequence simultaneously. Each attention head learns to focus on different relationships (e.g., syntactic, semantic) in the input, capturing diverse contextual dependencies. According to "Attention is All You Need" (Vaswani et al., 2017) and NVIDIA's NeMo documentation, multi-head attention enhances the expressive power of transformers, making them

highly effective for complex NLP tasks like translation or question-answering. Option A is incorrect, as multi-head attention increases memory usage. Option C is false, as positional encodings are still required. Option D is wrong, asmulti-head attention adds parameters.
References:
Vaswani, A., et al. (2017). "Attention is All You Need."
NVIDIA NeMo Documentation: https://docs.nvidia.com/deeplearning/nemo/user-guide/docs/en/stable/nlp/intro.html

NEW QUESTION # 20
How does A/B testing contribute to the optimization of deep learning models' performance and effectiveness in real-world applications? (Pick the 2 correct responses)

- A. A/B testing is irrelevant in deep learning as it only applies to traditional statistical analysis and not complex neural network models.
- B. A/B testing guarantees immediate performance improvements in deep learning models without the need for further analysis or experimentation.
- C. A/B testing allows for the comparison of different model configurations or hyperparameters to identify the most effective setup for improved performance.
- D. A/B testing helps validate the impact of changes or updates to deep learning models bystatistically analyzing the outcomes of different versions to make informed decisions for model optimization.
- E. A/B testing in deep learning models is primarily used for selecting the best training dataset without requiring a model architecture or parameters.

Answer: C,D

Explanation:
A/B testing is a controlled experimentation technique used to compare two versions of a system to determine which performs better. In the context of deep learning, NVIDIA's documentation on model optimization and deployment (e.g., Triton Inference Server) highlights its use in evaluating model performance:
* Option A: A/B testing validates changes (e.g., model updates or new features) by statistically comparing outcomes (e.g., accuracy or user engagement), enabling data-driven optimization decisions.
References:
NVIDIA Triton Inference Server Documentation: https://docs.nvidia.com/deeplearning/triton-inference-server/user-guide/docs/index.html

NEW QUESTION # 21
You are working with a data scientist on a project that involves analyzing and processing textual data to extract meaningful insights and patterns. There is not much time for experimentation and you need to choose a Python package for efficient text analysis and manipulation. Which Python package is best suited for the task?

- A. Pandas
- B. Matplotlib
- C. spaCy
- D. NumPy

Answer: C

Explanation:
For efficient text analysis and manipulation in NLP projects, spaCy is the most suitable Python package, as emphasized in NVIDIA's Generative AI and LLMs course. spaCy is a high-performance library designed specifically for NLP tasks, offering robust tools for tokenization, part-of-speech tagging, named entity recognition, dependency parsing, and word vector generation. Its efficiency and pre-trained models make it ideal for extracting meaningful insights from text under time constraints. Option A, NumPy, is incorrect, as it is designed for numerical computations, not text processing. Option C, Pandas, is useful for tabular data manipulation but lacks specialized NLP capabilities. Option D, Matplotlib, is for data visualization, not text analysis. The course highlights: "spaCy is a powerful Python library for efficient text analysis and manipulation, providing tools for tokenization, entity recognition, and other NLP tasks, making it ideal for processing textual data." References: NVIDIA Building Transformer-Based Natural Language Processing Applications course; NVIDIA Introduction to Transformer-Based Natural Language Processing.

NEW QUESTION # 22
What is Retrieval Augmented Generation (RAG)?

- A. RAG is a methodology that combines an information retrieval component with a response generator.
- B. RAG is a technique used to fine-tune pre-trained LLMs for improved performance.
- C. RAG is an architecture used to optimize the output of an LLM by retraining the model with domain- specific data.
- D. RAG is a method for manipulating and generating text-based data using Transformer-based LLMs.

Answer: A

Explanation:
Retrieval-Augmented Generation (RAG) is a methodology that enhances the performance of large language models (LLMs) by integrating an information retrieval component with a generative model. As described in the seminal paper by Lewis et al. (2020), RAG retrieves relevant documents from an external knowledge base (e.g., using dense vector representations) and uses them to inform the generative process, enabling more accurate and contextually relevant responses. NVIDIA's documentation on generative AI workflows, particularly in the context of NeMo and Triton Inference Server, highlights RAG as a technique to improve LLM outputs by grounding them in external data, especially for tasks requiring factual accuracy or domain- specific knowledge. Option A is incorrect because RAG does not involve retraining the model but rather augments it with retrieved data. Option C is too vague and does not capture the retrieval aspect, while Option D refers to fine-tuning, which is a separate process.
References:
Lewis, P., et al. (2020). "Retrieval-Augmented Generation for Knowledge-Intensive NLP Tasks." NVIDIA NeMo Documentation: https://docs.nvidia.com/deeplearning/nemo/user-guide/docs/en/stable/nlp
/intro.html

NEW QUESTION # 23
What are the main advantages of instructed large language models over traditional, small language models (<
300M parameters)? (Pick the 2 correct responses)

- A. Trained without the need for labeled data.
- B. It is easier to explain the predictions.
- C. Smaller latency, higher throughput.
- D. Cheaper computational costs during inference.
- E. Single generic model can do more than one task.

Answer: D,E

Explanation:
Instructed large language models (LLMs), such as those supported by NVIDIA's NeMo framework, have significant advantages over smaller, traditional models:
* Option D: LLMs often have cheaper computational costs during inference for certain tasks because they can generalize across multiple tasks without requiring task-specific retraining, unlike smaller models that may need separate models per task.
References:
NVIDIA NeMo Documentation: https://docs.nvidia.com/deeplearning/nemo/user-guide/docs/en/stable/nlp
/intro.html
Brown, T., et al. (2020). "Language Models are Few-Shot Learners."

NEW QUESTION # 24
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