List of questions

# Module 1: Introduction

### Lesson 1: Neo4j and genai

1. What are the potential benefits and challenges of integrating Generative AI with Neo4j?
2. How can Large Language Models (LLMs) be utilized in conjunction with knowledge graphs?
3. Define ‘hallucination’ in the context of LLMs and provide an example.
4. Why is it important to ground LLMs, and what strategies can be employed to avoid hallucinations?
5. Explain how vectors can enhance semantic search in Neo4j.
6. Discuss the role of vector indexes in improving the accuracy of semantic searches.
7. Describe the process of integrating Neo4j with Langchain using Python.
8. What are the advantages of using an LLM for query generation in Neo4j?
9. How does the Cypher QA Chain work, and what specific instructions are necessary for its effective operation?
10. In what ways can a conversational agent be beneficial when connected to Neo4j?

### Lesson 2: Hallucination

1. What is meant by an LLM “hallucinating,” and how does it relate to the concept of overfitting and biases in training data?
2. How does adjusting the ‘temperature’ setting in an LLM affect the randomness and creativity of its output?
3. Describe how prompt engineering can improve the accuracy of LLM responses without retraining the model.
4. Provide an example of how in-context learning can guide an LLM to better understand and respond to a query about a specific subject.
5. Explain how grounding an LLM with external data sources can enhance the relevance and timeliness of its responses.
6. Discuss the benefits and complexities involved in fine-tuning an LLM for a specialized task or domain.
7. How can integrating LLMs with Knowledge Graphs improve their semantic search capabilities?
8. What strategies can be employed to minimize the risk of LLMs disseminating misinformation?
9. What ethical considerations should be taken into account when deploying LLMs in real-world applications?
10. Speculate on the potential future advancements in LLM technology and their impact on information accuracy.

### Lesson 3: Grounding

1. What is Grounding in the context of Large Language Models (LLMs), and why is it important?
2. Explain the concept of Retrieval Augmented Generation and how it differs from traditional LLMs.
3. Discuss the computational costs associated with training a model like GPT-3. [Why is retraining on new data considered expensive](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C2%7Cb27d99ca-b69b-4589-88e8-cb88b045a7fd)?
4. [How can a news agency integrate real-time data with a pre-trained LLM to provide up-to-date information?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C3%7Cb27d99ca-b69b-4589-88e8-cb88b045a7fd)
5. [List and explain the benefits of using RAG for a news agency chatbot](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C4%7Cb27d99ca-b69b-4589-88e8-cb88b045a7fd)
6. [How does RAG enhance the accuracy of responses generated by an LLM?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C5%7Cb27d99ca-b69b-4589-88e8-cb88b045a7fd)
7. Describe how a knowledge graph could improve the performance of a news agency chatbot.
8. [Give an example of how the context provided in a prompt can influence the response of an LLM](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C5%7Cb27d99ca-b69b-4589-88e8-cb88b045a7fd)
9. Identify a common misconception about the capabilities of LLMs and explain the reality.
10. Propose a scenario where RAG would be beneficial outside of the news agency use case.

# Module 2: Vectors-semantic-search

### Lesson 1: Semantic search

1. [How does semantic search differ from traditional keyword search in terms of understanding user queries?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7Cccc4af5f-2558-4a6a-832c-bc54a11f79fc)
2. Why might semantic search provide more relevant results than traditional search methods?
3. What are vectors, and how are they used in the context of semantic search?
4. Can you explain how vector representations might improve the accuracy of search results?
5. How does Neo4j support semantic search, and what features does it offer to facilitate this?
6. [Discuss the importance of vector indexes in Neo4j for implementing semantic search](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7Cccc4af5f-2558-4a6a-832c-bc54a11f79fc)
7. What is Retrieval Augmented Generation (RAG), and why is it significant for language models?
8. Identify a potential challenge when using RAG with LLMs and suggest a solution.
9. How might LLMs be integrated with Neo4j to enhance semantic search capabilities?
10. Propose a scenario where LLMs could significantly improve the performance of Neo4j’s semantic search.

### Lesson 2: Vector index

1. What is the purpose of creating vector embeddings of movie plots in the Neo4j database?
2. Explain how vector embeddings can improve semantic search in a graph database context.
3. [Describe the process of loading vector embeddings into a Neo4j database using the LOAD CSV command2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7Ccbb31092-d182-4523-bc20-aefdaf8d9530)
4. What is the significance of the apoc.convert.fromJsonList() procedure in the context of loading embeddings?
5. How does the integration of generative AI with Neo4j enhance the capabilities of the database?
6. Discuss the potential benefits and challenges of using generative AI to generate query embeddings.
7. Compare and contrast the use of cosine and euclidean similarity functions in the context of vector indexes. Which one is generally preferred for text embeddings and why?
8. Given a new movie plot, outline the steps to generate its vector embedding and add it to the Neo4j database.
9. How would you verify the accuracy of the semantic search results after adding new vector embeddings?
10. Critique the reliance on vector embeddings and similarity functions for semantic search. What are the limitations of this approach?
11. Propose improvements or alternatives to the current method of semantic search using vector embeddings in Neo4j.

### Lesson 3: Improving semantic search

1. What are the potential drawbacks of relying solely on a vector index for semantic search?
2. [How can incorporating graph features into vector-backed semantic search enhance the results?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C31c50b06-da60-4d95-a622-e8dad13693ce)
3. Discuss the role of user feedback in improving the outcomes of semantic search.
4. [Explain how the GraphAcademy chatbot utilizes both Neo4j and LLMs to improve its response quality](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C31c50b06-da60-4d95-a622-e8dad13693ce)
5. What are the steps involved in creating a vector index in Neo4j, and how does it aid in semantic search?
6. How does initializing LLM chains contribute to the functionality of a conversational agent in Neo4j?
7. What strategies are mentioned to prevent LLMs from ‘hallucinating’ or providing irrelevant information?
8. [What is Langchain, and how does it simplify the creation of applications using large language models?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C2%7C31c50b06-da60-4d95-a622-e8dad13693ce)
9. How can LLMs be used for generating queries, and what is the significance of the Cypher QA Chain?

# Module 3: Intro to Langchain

### Lesson 1: Langchain

1. What is the primary purpose of Langchain in the context of building AI applications?
2. How does Langchain facilitate the testing of different LLMs for various use cases?
3. Identify the key components of a Langchain application and explain their roles.
4. [How do Chains in Langchain applications determine the best way to fulfill an instruction?1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C3dc029fb-7684-4f77-8332-fa15e185e00e)
5. [Discuss how Langchain’s out-of-the-box integrations with APIs and databases, particularly Neo4j, benefit developers2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C3dc029fb-7684-4f77-8332-fa15e185e00e).
6. [Explain the significance of Langchain’s flexibility in allowing minimal code changes when testing different LLM providers and models3](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C2%7C3dc029fb-7684-4f77-8332-fa15e185e00e).
7. Which programming languages are supported for building Langchain applications, and why is this diversity important?
8. How does memory in Langchain applications enhance the user experience, and can you provide an example of its practical application?
9. Describe the process of Model Interaction within Langchain and its importance in the framework.
10. What is the role of data connection and retrieval components in Langchain, and how do they contribute to the efficiency of queries?
11. Differentiate between Agents and Chains in Langchain and discuss how they work together to execute tasks.
12. Propose a hypothetical scenario where Langchain could be utilized to solve a complex problem by integrating with an LLM.

### Lesson 2: Initializing the LLM

1. What is the primary purpose of Neo4j in the context of graph databases?
2. Explain the concept of ‘grounding’ in relation to LLMs.
3. How would you use Langchain to initialize an LLM for a specific task?
4. Describe the process of creating a Python virtual environment and its benefits when installing Langchain.
5. Compare and contrast the different LLM providers supported by Langchain. What are the key factors to consider when choosing one?
6. Assess the importance of prompt templates in improving the interaction with LLMs. Can you provide an example where they might be particularly useful?
7. Design a prompt template for an LLM that would help retrieve information from a Neo4j database about fraud detection use cases.
8. Propose a method to integrate the Neo4j Vector Retriever with an LLM to enhance semantic search capabilities.

### Lesson 3: Chains

1. What is the purpose of using **LLM chains** in Langchain, and how do they contribute to modularity?
2. Given a scenario where you need to integrate a language model with a database, how would you utilize **LLMChain** to accomplish this?
3. Analyze the benefits of using **output parsers** in Langchain. How do they enhance the functionality of LLM chains?
4. [Evaluate the statement: "Chains are used to create modular and reusable components."1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C0a146690-05af-40f3-af3d-35bb20f0ea93)[2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C0a146690-05af-40f3-af3d-35bb20f0ea93) Provide reasons for your answer.
5. [Design a chain that combines a language model with a third-party API to create a weather information retrieval system3](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C2%7C0a146690-05af-40f3-af3d-35bb20f0ea93). What components would you need?
6. Propose a method to improve semantic search using vector indexes. How would this integrate with the Langchain framework?
7. Explain how **Langchain’s modularity** and **customizability** can be advantageous in building complex language model applications.
8. Critically assess the use of **cockney rhyming slang** in the provided code example. How does it affect the understandability of the output for a global audience?
9. If you encounter an error while initializing the LLM with an API key, what troubleshooting steps would you take within the Langchain framework?

### Lesson 4: Chat Models

1. What is the difference between a language model and a chat model in the context of LLMs?
2. How do system messages influence the behavior of a chat model?
3. If you were to create a chat model for a different scenario, say a financial advisor, what system message would you provide to guide the conversation?
4. Review the Python code provided for initializing a chat model. What would happen if you omitted the system message?
5. How would you modify the given Python code to connect the chat model with real-time weather data from an API?
6. Explain how grounding the chat model with current beach conditions can improve the accuracy of its responses.
7. What is Retrieval Augmented Generation and how does it relate to providing context in chat models?
8. Assess the potential limitations of using a chat model that relies solely on training data without real-time context.
9. Imagine a scenario where the chat model needs to provide surfing advice. How would you ensure the model’s responses are both accurate and engaging?
10. What are the benefits of wrapping a chat model in a chain, and how does it support more complex features?
11. [Discuss the importance of giving a chat model memory and how it can retain information between questions](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C19b7761a-3a3f-4f14-986e-fdb13719ffed)[2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C19b7761a-3a3f-4f14-986e-fdb13719ffed).

### Lesson 5: Memory

1. How does the ConversationBufferMemory class contribute to the functionality of a chat model in LangChain?
2. If a chat model lacks memory, what potential issues might arise during a conversation, as illustrated by the example with Martin?
3. Examine the provided code snippet for initializing the LLMChain with ConversationBufferMemory. What are the roles of the parameters memory\_key, input\_key, and return\_messages?
4. Given the scenario where the surf conditions change rapidly, how might the chat model’s memory affect its responses about the current weather at Watergate Bay?
5. Propose a method to improve the chat model’s memory capability to handle more complex conversations beyond simple Q&A.
6. Discuss the potential benefits and drawbacks of giving an LLM access to various tools and data sources, as mentioned in the upcoming lesson.

### Lesson 6: Agents

1. What is the purpose of creating an agent in the context of Neo4j and Generative AI?
2. Explain the role of ‘tools’ in the Langchain framework.
3. How would you modify the given agent to search for movie reviews instead of trailers?
4. Describe the process of adding a new tool to the existing agent setup.
5. Compare and contrast the use of ConversationBufferMemory and YouTubeSearchTool. How do they contribute differently to the agent’s functionality?
6. Analyze the significance of the return\_direct flag when creating a tool. What might be the implications of setting it to False?
7. [Assess the potential benefits and drawbacks of using a pre-existing prompt from the Langsmith Hub versus creating a custom prompt1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=69a7c21212f28f738ed8e1bbaac1261bd8a61a9d&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7Ca59cb883-26aa-405c-bd75-980bc9c6e631).
8. Critique the approach of using max\_iterations and verbose parameters in the AgentExecutor. How do they affect the agent’s performance?
9. Propose a design for a tool that integrates Neo4j database queries with the agent. How would this tool interact with the rest of the agent’s architecture?
10. Design a scenario where the agent could utilize both the Movie Chat and Movie Trailer Search tools in a single user query.

### Lesson 7: Connecting to neo4j

1. [What is the purpose of integrating Neo4j with Langchain?1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C08f97199-d8ed-4505-8504-c85fb4231a44)
2. Explain the role of the Neo4jGraph class in the Langchain framework.
3. [How would you connect to a Neo4j database using Langchain?1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C08f97199-d8ed-4505-8504-c85fb4231a44) Provide the steps.
4. Describe the process of running a Cypher query within the Langchain framework.
5. Compare and contrast the use of Neo4j’s native Python driver with the Neo4jGraph class provided by Langchain.
6. [Analyze the benefits of loading the database schema into memory when connecting to Neo4j through Langchain2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C08f97199-d8ed-4505-8504-c85fb4231a44).
7. Assess the implications of using Neo4j as a vector store for semantic search.
8. Critique the method used by Langchain to refresh the database schema. Is there a more efficient way?
9. [Design a new feature for Langchain that would improve its integration with Neo4j1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C08f97199-d8ed-4505-8504-c85fb4231a44).
10. Propose a method to extend the capabilities of the Cypher QA Chain for more complex queries.

### Lesson 8: Retrievers

1. What is the primary function of a retriever in the context of Langchain applications?
2. How does a retriever utilize a vector store to enhance its functionality?
3. Explain how the Neo4jVector class uses a Neo4j database. What are the advantages of this approach?
4. Describe the process of creating a Neo4jVector from an existing index.
5. Why is an embedding provider necessary when working with Neo4jVector?
6. Discuss the role of OpenAIEmbeddings in the code snippet provided on the page.
7. How does the similarity\_search() method work, and what is its significance in semantic search?
8. What would be the impact of changing the k value in the similarity\_search() method?
9. What are vector indexes, and how are they relevant to document retrieval in Langchain applications?
10. Critically analyze the steps involved in creating a new vector index with the Neo4jVector class.
11. How does the RetrievalQA chain integrate a retriever and a language model?
12. Evaluate the potential benefits and limitations of using the RetrievalQA chain in a Langchain application.
13. In what ways can LLMs be used for query generation within Neo4j?
14. Propose a scenario where the Cypher QA Chain could be effectively utilized.
15. What information is required to establish a connection to a Neo4j database for vector retrieval?
16. Assess the security implications of storing sensitive connection details in code.
17. How can vectors and semantic search contribute to the accuracy of a conversational agent?
18. Hypothesize the outcome of incorporating the movie plots vector retriever into a chat agent.

### Lesson 9: neo4j vector retriever

1. What is the purpose of grounding LLMs in the context of Neo4j and Generative AI?
2. Explain the term “vector indexes” and its significance in semantic search.
3. How would you integrate a Neo4jVector with a movie trailer agent to improve its functionality?
4. [Describe the process of creating a RetrievalQA chain using the Neo4jVector as the retriever1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C7b6713a5-62f9-4f49-8c86-60d60d8d63cd).
5. Compare and contrast the use of a standard LLM chain with a RetrievalQA chain in the context of query generation.
6. What challenges might arise when trying to connect an LLM to Neo4j, and how could these be addressed?
7. [Assess the potential benefits of using an LLM for generating Cypher queries2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C7b6713a5-62f9-4f49-8c86-60d60d8d63cd).
8. Critique the approach of giving a Chat Model memory. What are the pros and cons?
9. Design a function that would allow a RetrievalQA chain to be called from a tool executor that expects a single query input and output key.
10. Propose a method for improving semantic search using the concepts learned in the course.

# Module 4: Cypher generation

### Lesson 1: Cypher qa chain

1. What is the purpose of the GraphCypherQAChain in the context of Neo4j and LLMs?
2. Explain how vector indexes contribute to semantic search in Neo4j.
3. Given a schema of a graph database, how would you formulate a Cypher query to find all actors who have acted in a movie directed by Christopher Nolan?
4. Analyze the potential challenges one might face when using LLMs to generate Cypher queries for Neo4j databases.
5. Evaluate the effectiveness of using the GraphCypherQAChain for querying structured data as opposed to unstructured data.
6. Design a new prompt template that could help improve the accuracy of Cypher query generation by an LLM.
7. How would you address the issue of inconsistent results when using LLMs to generate Cypher queries?

### Lesson 2: Specific instructions

1. [What is the significance of providing specific instructions to a Language Model (LLM) when generating Cypher statements?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)[1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)
2. How can instructions impact the accuracy of Cypher statements generated by an
3. Why is it important for the generated Cypher statements to conform to the schema of the graph database?
4. What could be the consequences of not following the provided schema in the Cypher statements?
5. Explain how data formatting, such as renaming movie titles that start with “The”, can affect the results of a query.
6. What are the potential issues that might arise if the LLM does not correctly format the movie titles according to the database’s conventions?
7. [Discuss the importance of instructing the LLM to respond only when the Cypher statement returns data](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)[2](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C1%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b).
8. What are the benefits of restricting the LLM’s responses to only include the generated Cypher statement without additional text?
9. [How would you find the right balance between providing too much or too little instruction to the LLM?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C2%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)[3](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C2%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)
10. Can you think of a scenario where the LLM might benefit from less specific instructions?
11. Why might it be necessary to experiment with different instructions when working with an LLM?
12. Provide an example of how experimenting with instructions could lead to improved LLM performance.
13. [Based on the lesson summary, why can’t you expect the LLM to return exactly the response you require even with specific instructions?](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C3%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)[4](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C3%7C21854d89-ac5c-4600-a6fd-477ca4a9e75b)
14. How does the unpredictability of LLM responses influence the way you provide instructions?

### Lesson 3: Fewshow examples

1. What is Few-Shot Prompting and how does it differ from other machine learning techniques?
2. Provide an example where Few-Shot Prompting could significantly improve the accuracy of a language model’s output.
3. Analyze the incorrect Cypher query provided by the LLM. What assumptions did the LLM make, and why were they incorrect?
4. [Given the incorrect Cypher statement generated by the LLM, how would you correct it to accurately find the genres of movies directed by Tom Hanks?1](https://edgeservices.bing.com/edgesvc/chat?udsframed=1&form=SHORUN&clientscopes=chat,noheader,udsedgeshop,channelstable,ntpquery,devtoolsapi,udsinwin11,udsdlpconsent,udscstart,cspgrd,&shellsig=0d133f2a211bf1b487bf95f2f1ae71d7e43de561&setlang=en-US&lightschemeovr=1#sjevt%7CDiscover.Chat.SydneyClickPageCitation%7Cadpclick%7C0%7C2ce1d38c-60cf-43b6-a303-6eb0583ce114)
5. How can the concept of Few-Shot Prompting be applied to other scenarios outside of Cypher query generation?
6. Explain how vector indexes can improve semantic search in the context of Neo4j databases.
7. Discuss the importance of grounding LLMs in real-world data and how it can prevent hallucination.
8. What are the benefits of integrating a Neo4j Vector Retriever with a language model?
9. How can giving a Chat Model memory enhance its performance as a conversational agent?
10. Why is it important to provide specific instructions to an LLM, and how can this affect the outcome of generated responses?

### Lesson 4: Conversational agent

1. What are the fundamental concepts of Large Language Models (LLMs) that were covered in this course?
2. How can Langchain be utilized to interact with LLMs, and what are its benefits?
3. In what ways does Neo4j support LLMs in answering questions?
4. Explain the importance of vector indexes in understanding and searching unstructured data.
5. Describe the process of building a Neo4j-backed chatbot using Python and Streamlit.
6. How can GenAI be integrated with Neo4j and LLMs to enhance their capabilities?
7. Discuss how the knowledge and skills learned in this course can be applied to create a conversational agent.
8. Reflect on how this course has contributed to your understanding of Neo4j, LLMs, and GenAI.
9. What are the next steps for someone who wants to continue learning about Neo4j, LLMs, and GenAI after completing this course?