

```
= Vector Retriever
:order: 2
:type: lesson
:branch: main
```

In this lesson, you will create a vector retriever to retrieve relevant data from Neo4j.

A retriever is a component that takes unstructured data (typically a user's query) and retrieves relevant data.

You will create a vector retriever that finds similar movies based on a movie plot.

The retriever will use the `moviePlots` vector index you used to search for similar movies using Cypher.

To find similar movies using a retriever you need to:

- Connect to a Neo4j database
- Create an `_embedder_` to convert user's queries into vectors
- Create a `_retriever_` that uses the `moviePlots` vector index
- Use the retriever to search for similar movies using the user's query
- Parse the results

Open the `genai-fundamentals/vector_retriever.py` file and review the program:

```
[source,python]
.vector_retriever.py
-----
include::{repository-raw}/{branch}/genai-fundamentals/vector_retriever.py[tag=**]
-----
```

The program includes the code to connect to the Neo4j database using the link: <https://neo4j.com/docs/python-manual/current/> [Neo4j Python driver^].

[TIP]

You can learn more about the Neo4j Python driver in the Graph Academy link: <https://graphacademy.neo4j.com/courses/drivers-python/> [Using Neo4j with Python^] course.

== Embedder

Create the embedder that will convert the user's query into a vector:

```
[source,python]
-----
include::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=import-embedder]

include::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=embedder]
```

[NOTE]

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You must use the same embedding model as the one used to create the movie plots embeddings, `text-embedding-ada-002`, to ensure the vectors are compatible.

The
link:<https://neo4j.com/docs/neo4j-graphrag-python/current/api.html#embedder>[`neo4j-graphrag` package supports multiple embeddings models¹] and the ability to create your own interface.

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== Retriever

Create the retriever that will use the `moviePlots` vector index:

[source,python]

include:::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=import-retriever]

include:::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=retriever]

The retriever allows you to specify what properties to return from the nodes that match the query.

== Search

You can use the retriever to search the vector index by passing a query and the number of results to return.

The retriever will use the embedder to convert the query into a vector to use in the search.

Search for similar movies:

[source,python]

include:::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=search]

The `search` method returns a list of `items` that match the query.

Iterate over the items and print the results:

[source,python]

include:::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=print-results]

```
----  
[%collapsible]  
.Click to view the complete code  
====  
[source,python]  
----  
include:::{repository-raw}/{branch}/genai-fundamentals/solutions/vector_retriever.py[tag=**]  
----  
====
```

Run the program to search for similar movies based on a query.

You should see movie `titles`, `plots`, and the similarity `score` for the times found.

```
[%collapsible]  
.Click to reveal a typical output  
====  
[source]  
----  
{'title': 'Toy Story', 'plot': "A cowboy doll is profoundly threatened and jealous when a new spaceman figure supplants him as top toy in a boy's room."} 0.9099578857421875  
{'title': 'Pinocchio', 'plot': 'A living puppet, with the help of a cricket as his conscience, must prove himself worthy to become a real boy.'} 0.9085540771484375  
{'title': 'Adventures of Pinocchio, The', 'plot': "One of puppet-maker Geppetto's creations comes magically to life. This puppet, Pinocchio, has one major desire and that is to become a real boy someday. In order to accomplish this goal he ..."} 0.9070587158203125  
{'title': 'Jumanji', 'plot': 'When two kids find and play a magical board game, they release a man trapped for decades in it and a host of dangers that can only be stopped by finishing the game.'} 0.9043426513671875  
{'title': 'Secret Adventures of Tom Thumb, The', 'plot': 'A boy born the size of a small doll is kidnapped by a genetic lab and must find a way back to his father in this inventive adventure filmed using stop motion animation techniques. Tom meets...'} 0.903472900390625  
----  
====
```

Experiment with different queries to find different movies.

== Check Your Understanding

```
include::questions/1-embedder.adoc[leveloffset=+1]
```

```
[ .summary]  
== Lesson Summary
```

In this lesson, you learned how to create a vector retriever using the

`neo4j-graphrag` package.

In the next module, you will build this retriever into a simple RAG pipeline that will use an LLM to answer questions using the retrieved data.