

```
= 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 users query) and retrieves relevant data.

You will create a vector retriever that find 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 users queries into vectors
- . Create a `_retriever_` that uses the `moviePlots` vector index
- . Use the retriever to search for similar movies using the users 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 programs includes the code to connect to the Neo4j database using the link:[https://neo4j.com/docs/python-manual/current/\[Neo4j Python driver^\]](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/\[Using Neo4j with Python^\]](https://graphacademy.neo4j.com/courses/drivers-python/[Using Neo4j with Python^]) course.

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== Embedder
```

Create the embedder that will convert the users 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 models^] 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

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[source,python]

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

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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

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[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
```

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Experiment with different queries to find different movies.

== Check Your Understanding

```
include::questions/1-embedder.adoc[leveloffset=+2]
```

[.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.