Lab-4 Python and MongoDB

Brief Survey!

Python Exercises

- **INDIVIDUAL** submission

- Create a Python script named ***concepts.py*** to demonstrate the concepts:

  a. *Variables, types, operators*

  b. *Booleans and conditional (if-else) statements*

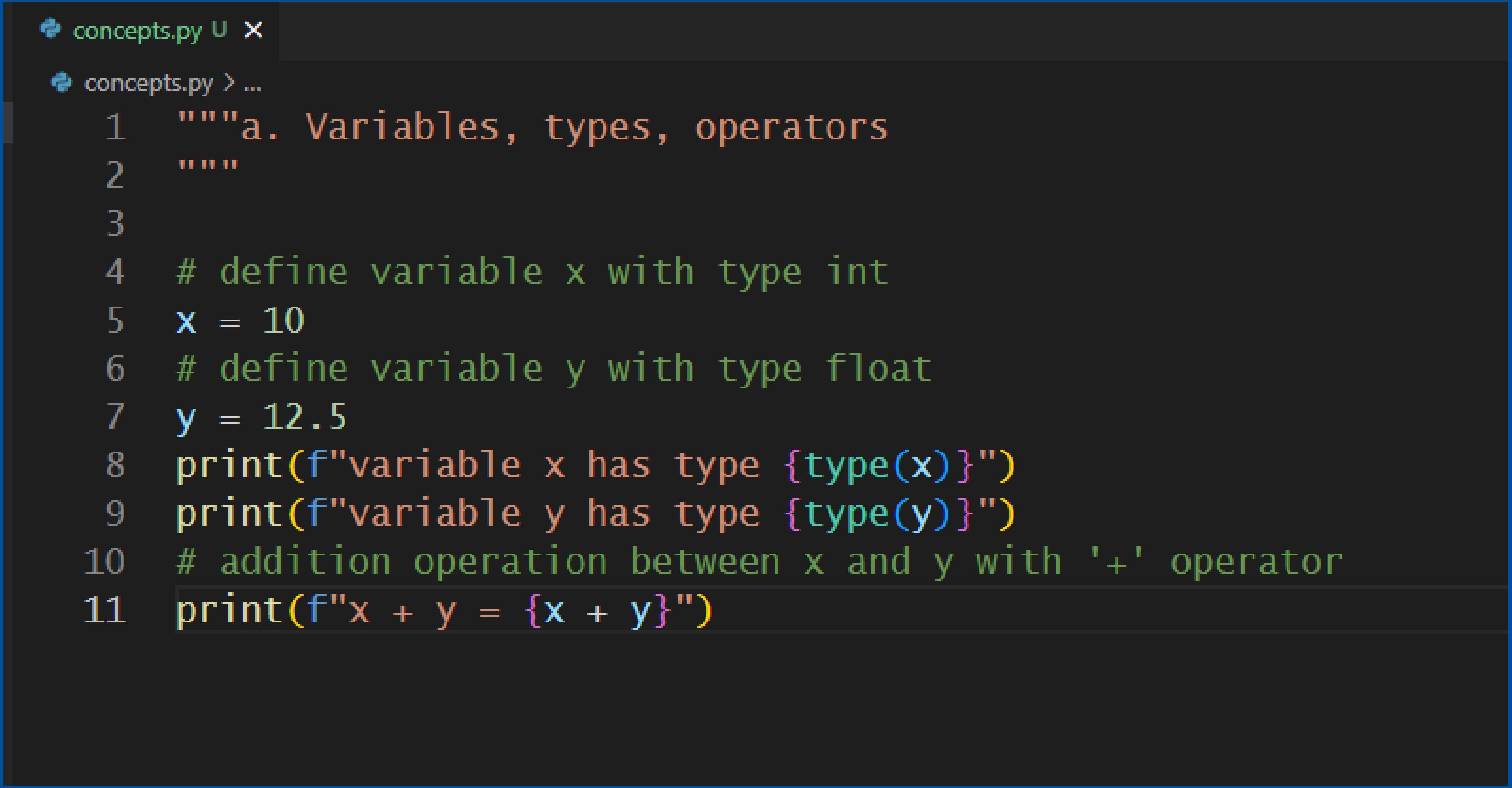
  c. *Strings and string methods*

  d. *Lists, loops (while, for), iteration (for-in)*

  e. *Dictionaries and dict methods*

  f. *Functions, parameters, and returns*

Python Exercises (cont.)



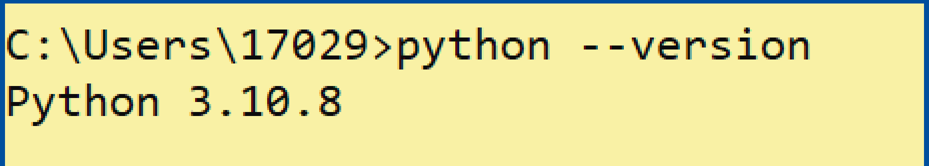
```python
"""a. Variables, types, operators
"""

# define variable x with type int
x = 10
# define variable y with type float
y = 12.5
print(f"variable x has type {type(x)}")
print(f"variable y has type {type(y)}")
# addition operation between x and y with '+' operator
print(f"x + y = {x + y}")
```

Python Installation

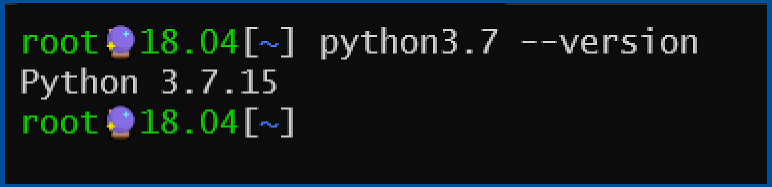
- Python **3.8.x** / Python **3.9.x** / Python **3.10.x**
- Installation Guide for **Windows** User
- Installation Guide for **Mac** User (*Install Python 3 with the Official Installer*)

Verify the Python Installation

- *python --version*
- *python3 --version*
- *python3.x(replace x with the version number you downloaded) --version*
- *py --version*



```
C:\Users\17029>python --version
Python 3.10.8
```



```
root🔮18.04[~] python3.7 --version
Python 3.7.15
root🔮18.04[~]
```

FAQs

- What is py.exe? (Windows users)
- Why does running python.exe open the Microsoft Store? (Windows users)
- […] not found (Windows users / Mac users)
- Work with multiple Python versions (Windows users)

Reach out to us with any questions!

Python Interactive Mode

- Python interactive mode is a command line shell which gives immediate feedback for each statement.
- Python interactive mode is a good way to play around and try variations on syntax.

```
…… $ python
Python 3.10.8 (tags/v3.10.8:aaaf517, Oct 11 2022, 16:50:30) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

Python Interactive Mode (cont.)

- quit the Python interactive mode

  all platforms: exit()

  Windows: ctrl + break(pause)

  Mac/Linux: ctrl + D

pip

- ***pip*** is a package manager for Python packages or modules
- ***pip*** is included by default if you have Python version 3.4 or later
- use ***pip*** to install packages

```
python –m pip install <package>
```

```
pip install <package>
```

Editor/IDE

- **Visual Studio Code (VSCode)**
- PyCharm
- IDLE
- Spyder
- …

MongoDB

- NoSQL database, NO tables/rows
- uses collections of documents to store data, each document is a JSON-like object with a set of key-value pairs
- uses its own query language called the MongoDB Query Language(MQL)

SQL: `> select * from orders where customer_id = '123’`

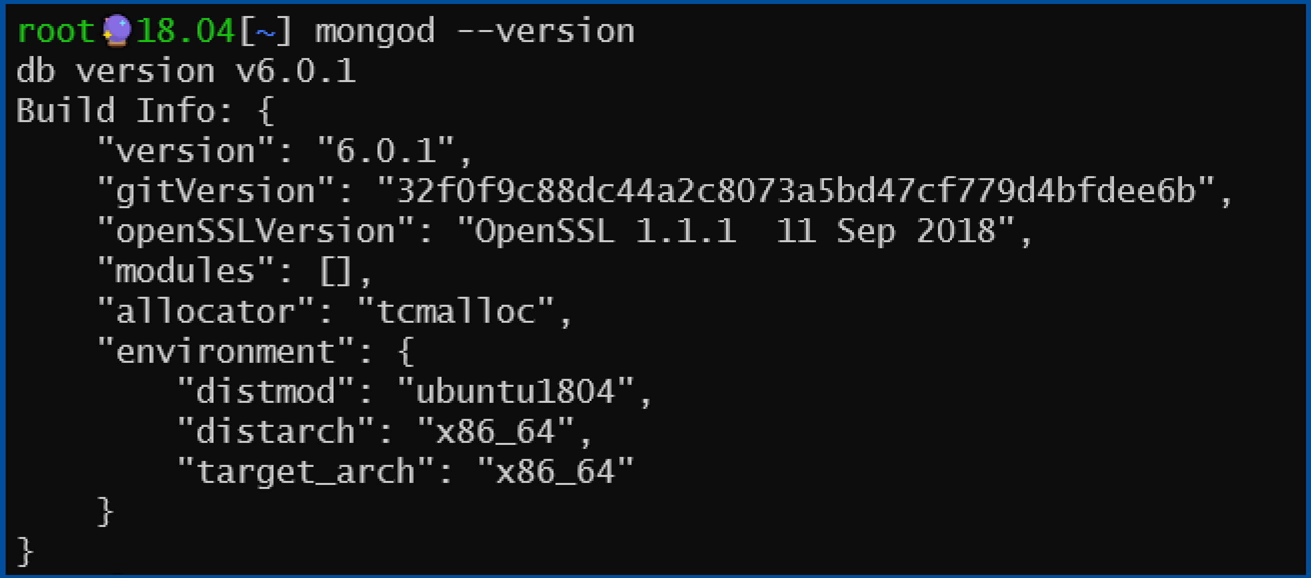
MQL: `> db.orders.find({customer_id: '123'})`

MongoDB Installation

- **MongoDB Community Server 6.0.4**
- Installation Guide for **Windows** User
- Installation Guide for **Mac** User

Verify the MongoDB Installation

- *mongod --version*



```
root🔮18.04[~] mongod --version
db version v6.0.1
Build Info: {
    "version": "6.0.1",
    "gitVersion": "32f0f9c88dc44a2c8073a5bd47cf779d4bfdee6b",
    "openSSLVersion": "OpenSSL 1.1.1  11 Sep 2018",
    "modules": [],
    "allocator": "tcmalloc",
    "environment": {
        "distmod": "ubuntu1804",
        "distarch": "x86_64",
        "target_arch": "x86_64"
    }
}
```

PyMongo

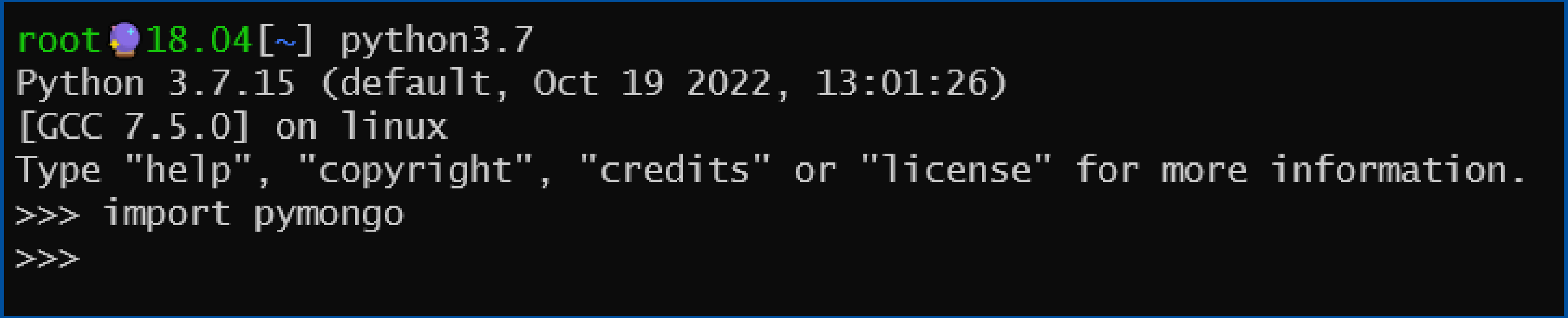
- PyMongo is a Python distribution containing tools for working with MongoDB, and is the recommended way to work with MongoDB from Python
- install PyMongo with *pip*

```
python –m pip install pymongo
```

```
pip install pymongo
```

Verify the PyMongo Installation

- activate the Python interactive mode and enter *import pymongo*



```
root🔮18.04[~] python3.7
Python 3.7.15 (default, Oct 19 2022, 13:01:26)
[GCC 7.5.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import pymongo
>>>
```

Database Exercises

- **INDIVIDUAL** submission

- Create a Python script named ***database.py*** to perform CRUD operations on a local MongoDB database:

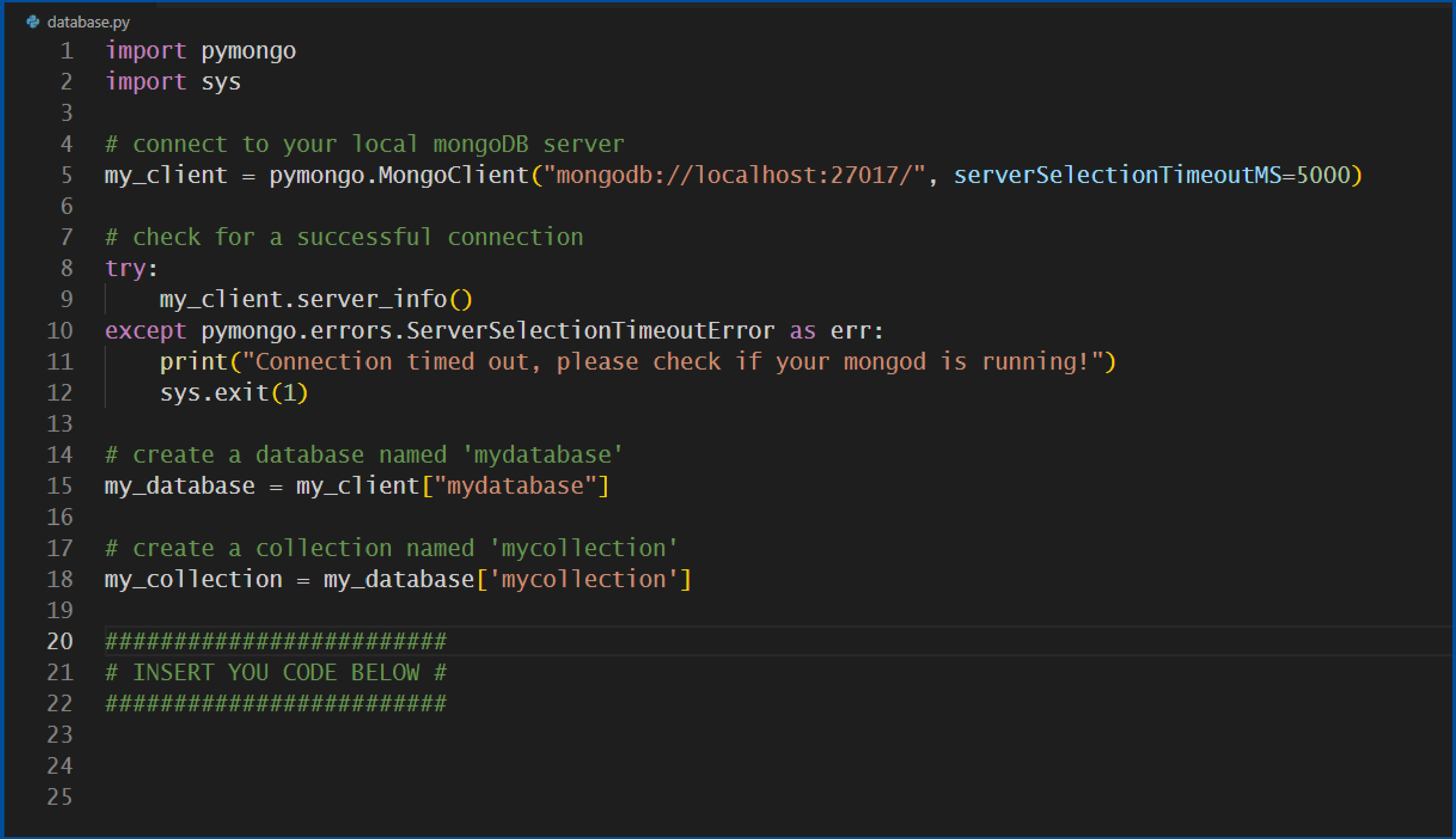
  a. create

  b. read

  c. write (update)

  d. delete

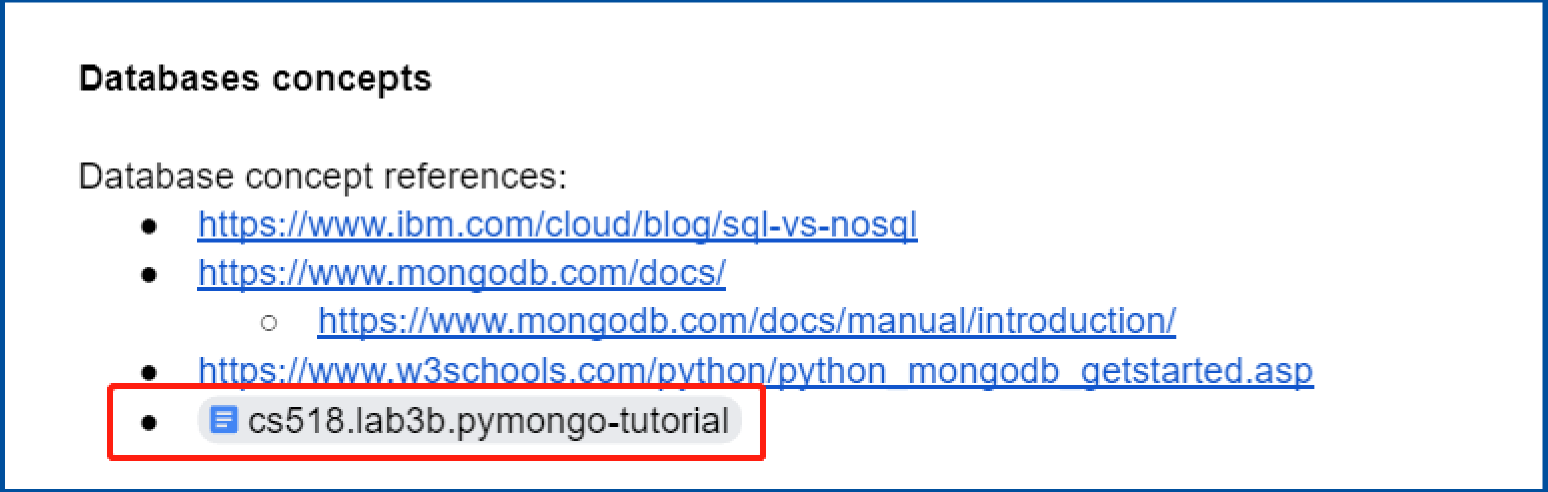
Database Exercises (cont.)



```python
import pymongo
import sys

# connect to your local mongoDB server
my_client = pymongo.MongoClient("mongodb://localhost:27017/", serverSelectionTimeoutMS=5000)

# check for a successful connection
try:
    my_client.server_info()
except pymongo.errors.ServerSelectionTimeoutError as err:
    print("Connection timed out, please check if your mongod is running!")
    sys.exit(1)

# create a database named 'mydatabase'
my_database = my_client["mydatabase"]

# create a collection named 'mycollection'
my_collection = my_database['mycollection']

#########################
# INSERT YOU CODE BELOW #
#########################
```

More References

- Python tutorial
- PyMongo tutorial
- MongoDB tutorial



Databases concepts

Database concept references:

- https://www.ibm.com/cloud/blog/sql-vs-nosql
- https://www.mongodb.com/docs/
  - https://www.mongodb.com/docs/manual/introduction/
- https://www.w3schools.com/python/python_mongodb_getstarted.asp
- cs518.lab3b.pymongo-tutorial

Submission (due 2/28 11:59 p.m.)

Canvas (INDIVIDUAL submission)

- a Python script: concepts.py
- a Python script: database.py
- a document (pdf/docx): answers to the database questions.

~~GitLab~~

More Questions?

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