Assignment No. 8

Group ID: 2018BCGRP10
Batch: T2
PRN No: 2018BTECS00072 & 2018BTECS00086

- **Title: NoSQL Databases**

- **Aim:** To Install & deploy the following cloud databases on windows platform :

  A] MongoDB
  B] CassandraDB

  Write Python desktop Application to demonstrate the CRUD operation with above backend cloud databases. Assume any database.

- **Introduction:**

  NoSQL Databases:

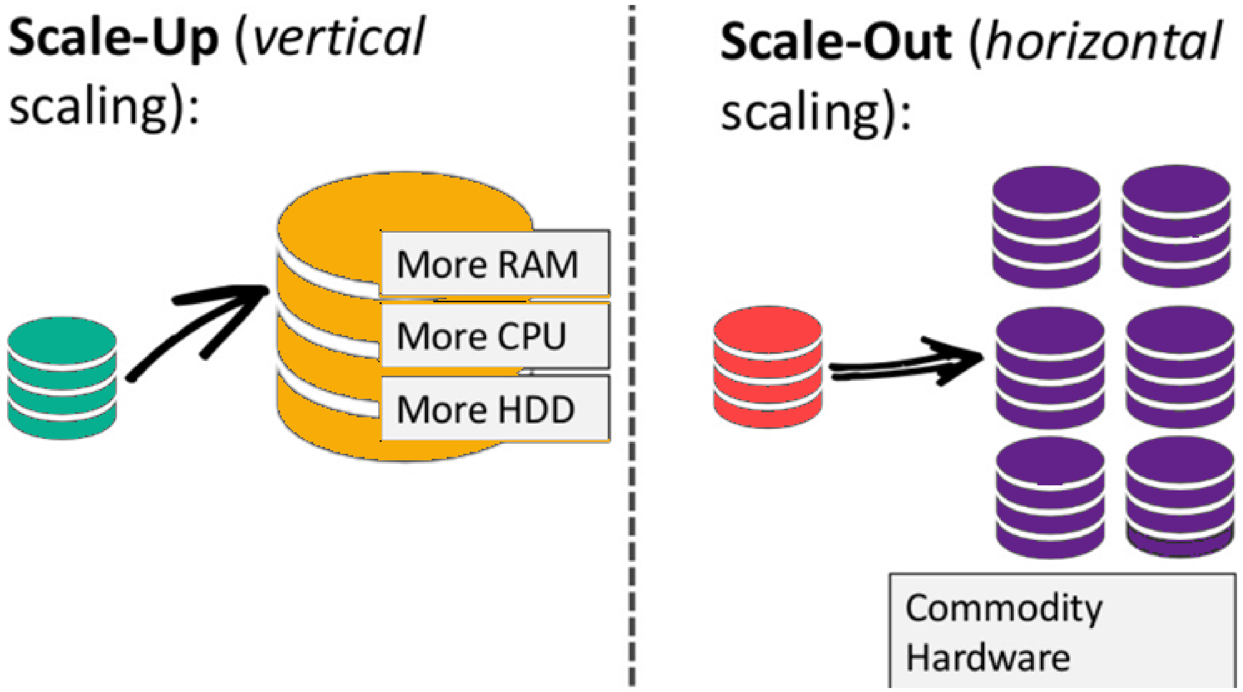
_____NoSQL Database is a non-relational Data Management System that does not require a fixed schema. It avoids joins, and is easy to scale. The major purpose of using a NoSQL database is for distributed data stores with humongous data storage needs. NoSQL is used for Big data and real-time web apps. For example, companies like Twitter, Facebook and Google collect terabytes of user data every single day.

Why NoSQL?

The concept of NoSQL databases became popular with Internet giants like Google, Facebook, Amazon, etc. who deal with huge volumes of data. The system response time becomes slow when you use RDBMS for massive volumes of data.

To resolve this problem, we could "scale up" our systems by upgrading our existing hardware. This process is expensive.

The alternative for this issue is to distribute database load on multiple hosts whenever the load increases. This method is known as "scaling out."



NoSQL databases are non-relational, so it scales out better than relational databases as they are designed with web applications in mind.

Features of NoSQL:

1. Non-relational
2. Schema-free
3. Simple API
4. Distributed

MongoDB:

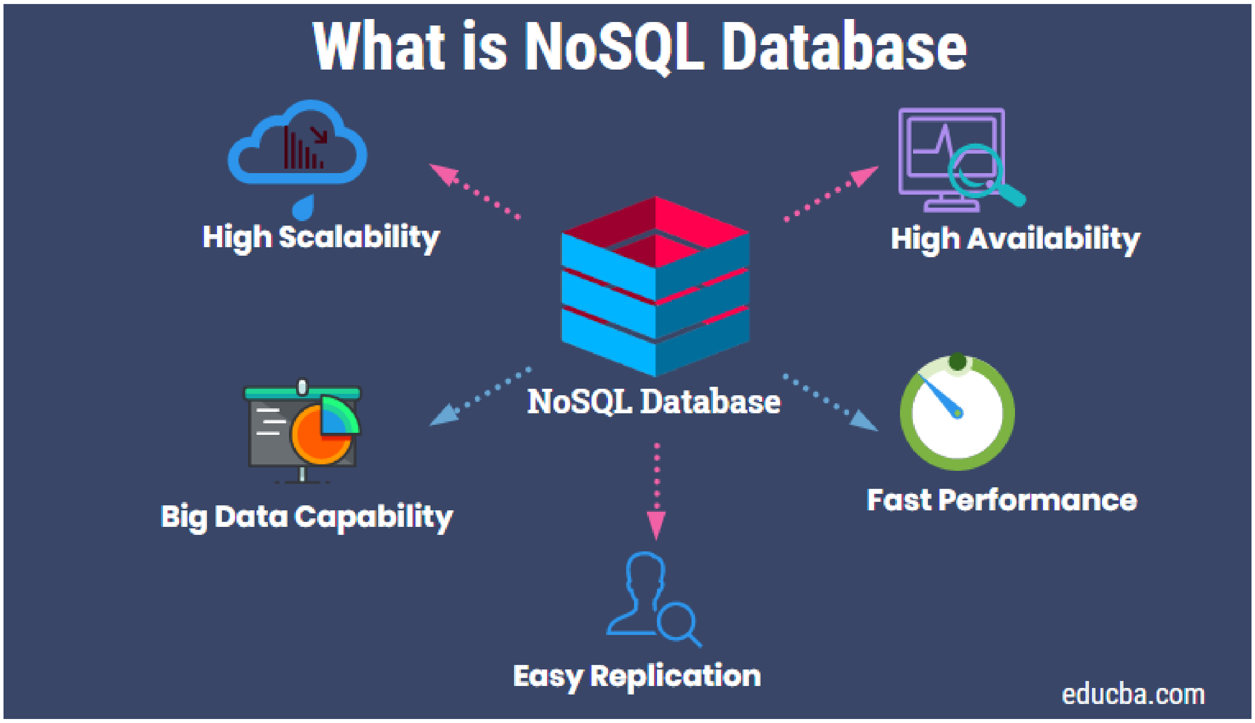
MongoDB is a document database with the scalability and flexibility that you want with the querying and indexing that you need.

MongoDB's document model is simple for developers to learn and use, while still providing all the capabilities needed to meet the most complex requirements at any scale.

Cassandra Database:

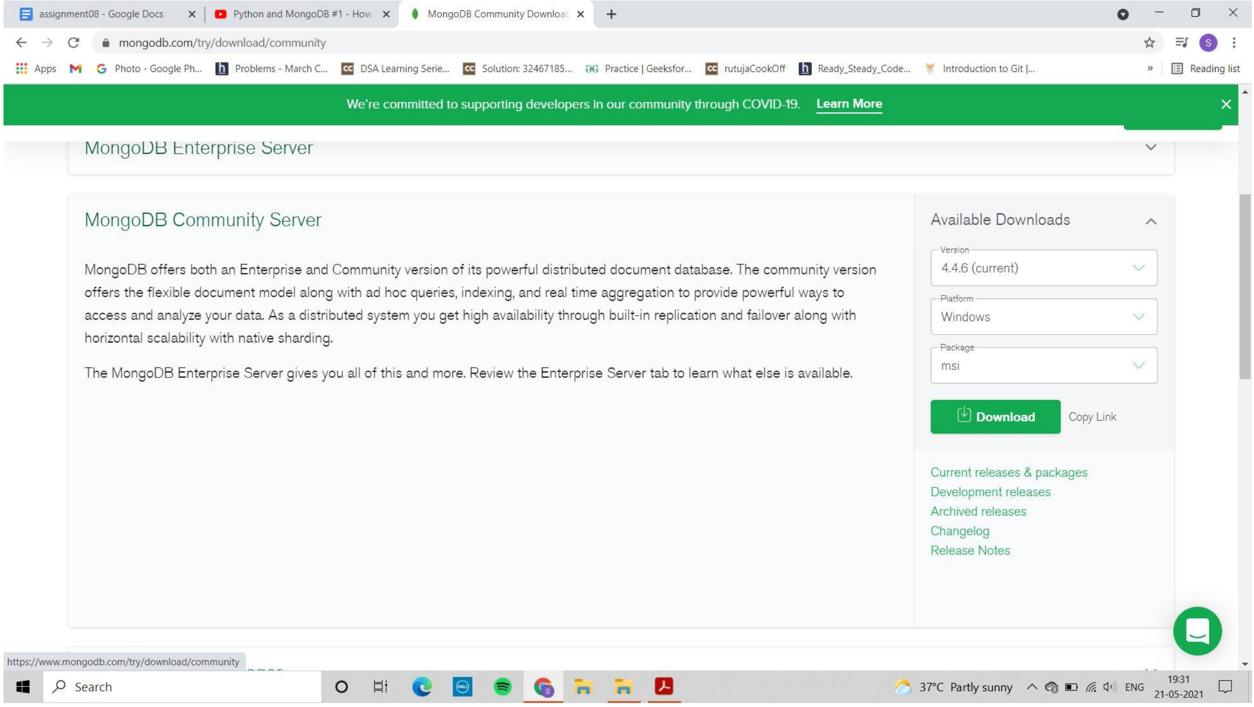
Apache Cassandra is an open source NoSQL distributed database trusted by thousands of companies for scalability and high availability without compromising performance. Linear scalability and proven fault-tolerance on commodity hardware or cloud infrastructure make it the perfect platform for mission-critical data.

- **Functional Block Diagram:**



- **Screenshots Of Experiment:**

First, downloaded MongoDB setup:



We're committed to supporting developers in our community through COVID-19. Learn More

MongoDB Enterprise Server

MongoDB Community Server

MongoDB offers both an Enterprise and Community version of its powerful distributed document database. The community version offers the flexible document model along with ad hoc queries, indexing, and real time aggregation to provide powerful ways to access and analyze your data. As a distributed system you get high availability through built-in replication and failover along with horizontal scalability with native sharding.

The MongoDB Enterprise Server gives you all of this and more. Review the Enterprise Server tab to learn what else is available.

Available Downloads

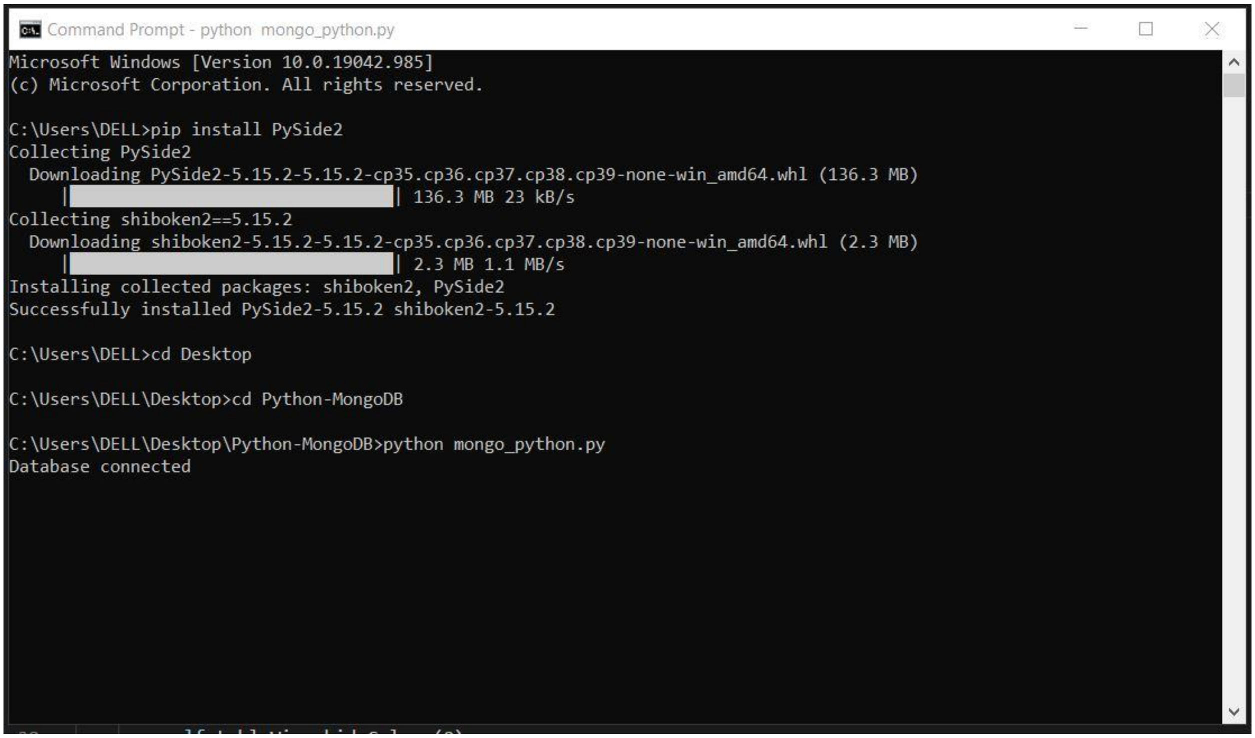
Version: 4.4.6 (current)

Platform: Windows

Package: msi

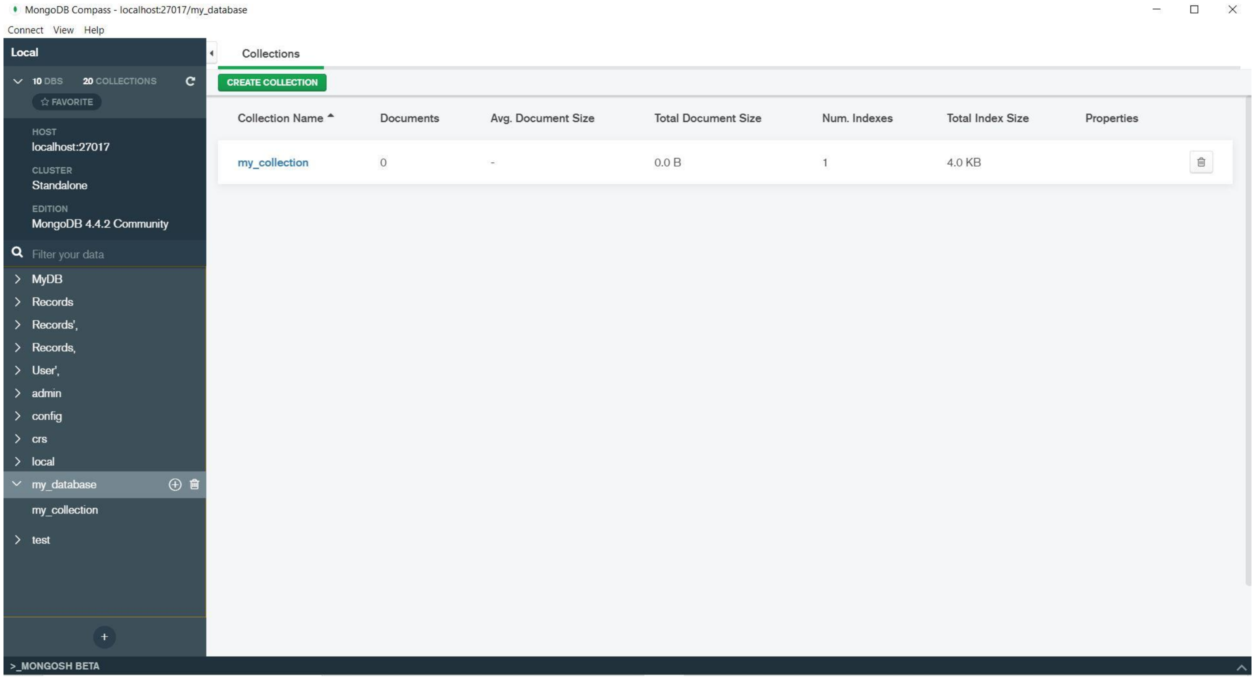
- **MongoDB Python Connection using PyMongo**
  1. PyMongo is the Python Driver for mongoDB
  2. The PyMongo distribution contains tools for interacting with MongoDB databases from Python.
  3. The bson package is an implementation of the BSON format for Python. The pymongo package is a native Python driver for MongoDB.
  4. The gridfs package is a gridfs implementation on top of pymongo

Then, connected to database:



```
Microsoft Windows [Version 10.0.19042.985]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DELL>pip install PySide2
Collecting PySide2
  Downloading PySide2-5.15.2-5.15.2-cp35.cp36.cp37.cp38.cp39-none-win_amd64.whl (136.3 MB)
     |████████████████████████████████| 136.3 MB 23 kB/s
Collecting shiboken2==5.15.2
  Downloading shiboken2-5.15.2-5.15.2-cp35.cp36.cp37.cp38.cp39-none-win_amd64.whl (2.3 MB)
     |████████████████████████████████| 2.3 MB 1.1 MB/s
Installing collected packages: shiboken2, PySide2
Successfully installed PySide2-5.15.2 shiboken2-5.15.2

C:\Users\DELL>cd Desktop

C:\Users\DELL\Desktop>cd Python-MongoDB

C:\Users\DELL\Desktop\Python-MongoDB>python mongo_python.py
Database connected
```

Created a database ‘my_database’ with collection ‘my_collection’:



HOST localhost:27017

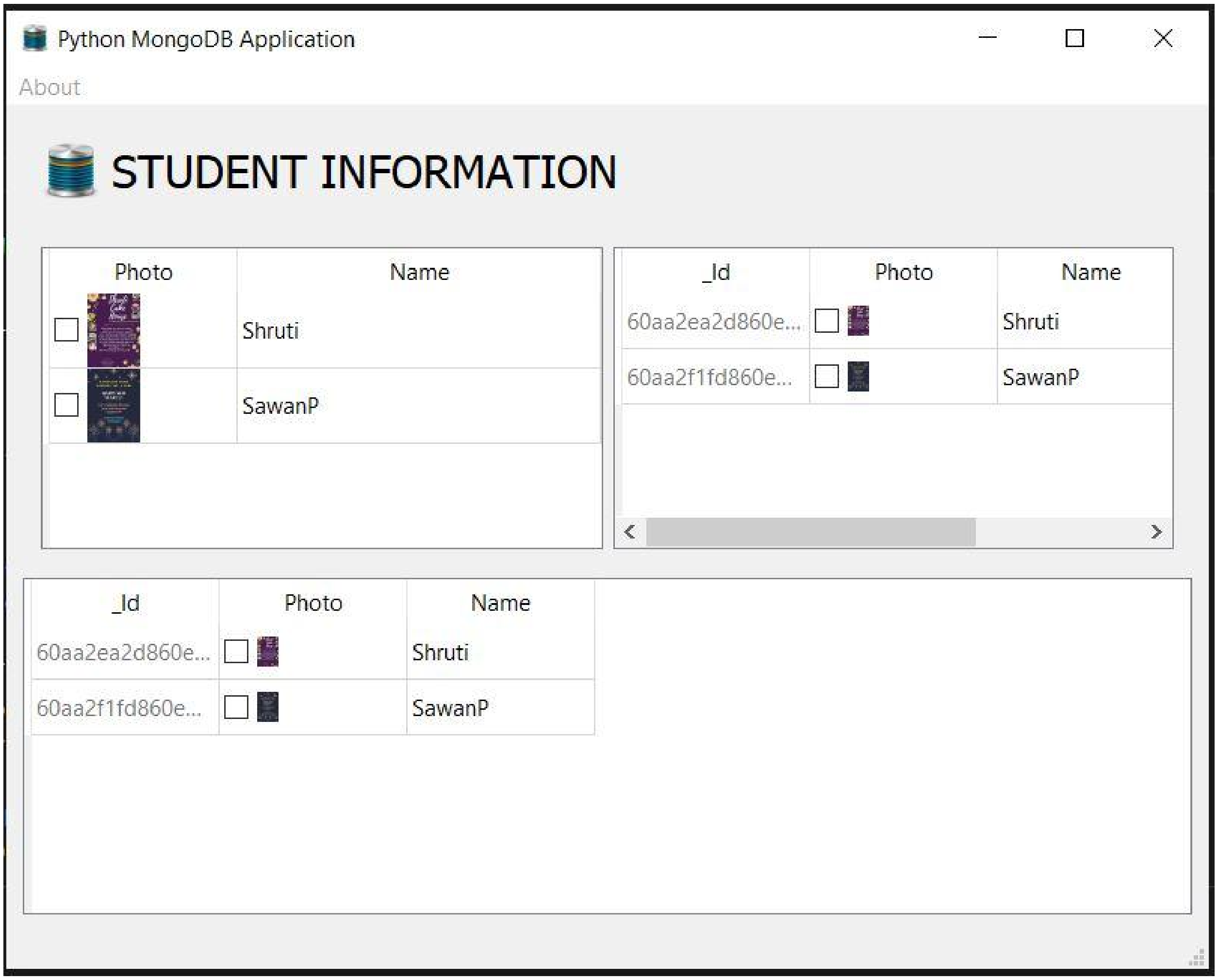
CLUSTER Standalone

EDITION MongoDB 4.4.2 Community

- MyDB
- Records
- Records',
- Records,
- User',
- admin
- config
- crs
- local
- my_database
  - my_collection
- test

Collection Name	Documents	Avg. Document Size	Total Document Size	Num. Indexes	Total Index Size	Properties
my_collection	0	-	0.0 B	1	4.0 KB	

READ Operation:



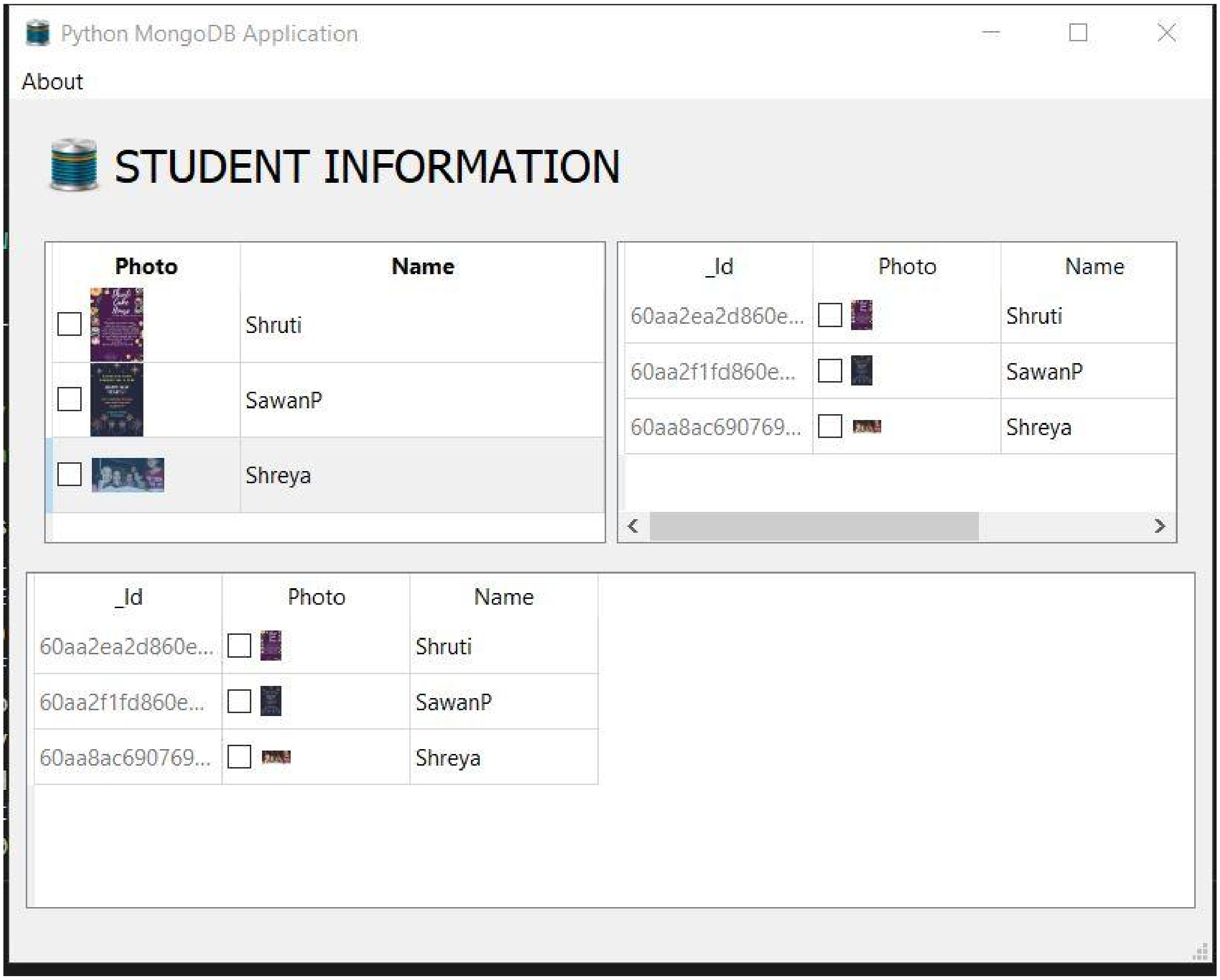
STUDENT INFORMATION

Photo	Name
□	Shruti
□	SawanP

_Id	Photo	Name
60aa2ea2d860e...	□	Shruti
60aa2f1fd860e...	□	SawanP

_Id	Photo	Name
60aa2ea2d860e...	□	Shruti
60aa2f1fd860e...	□	SawanP

CREATE Operation:



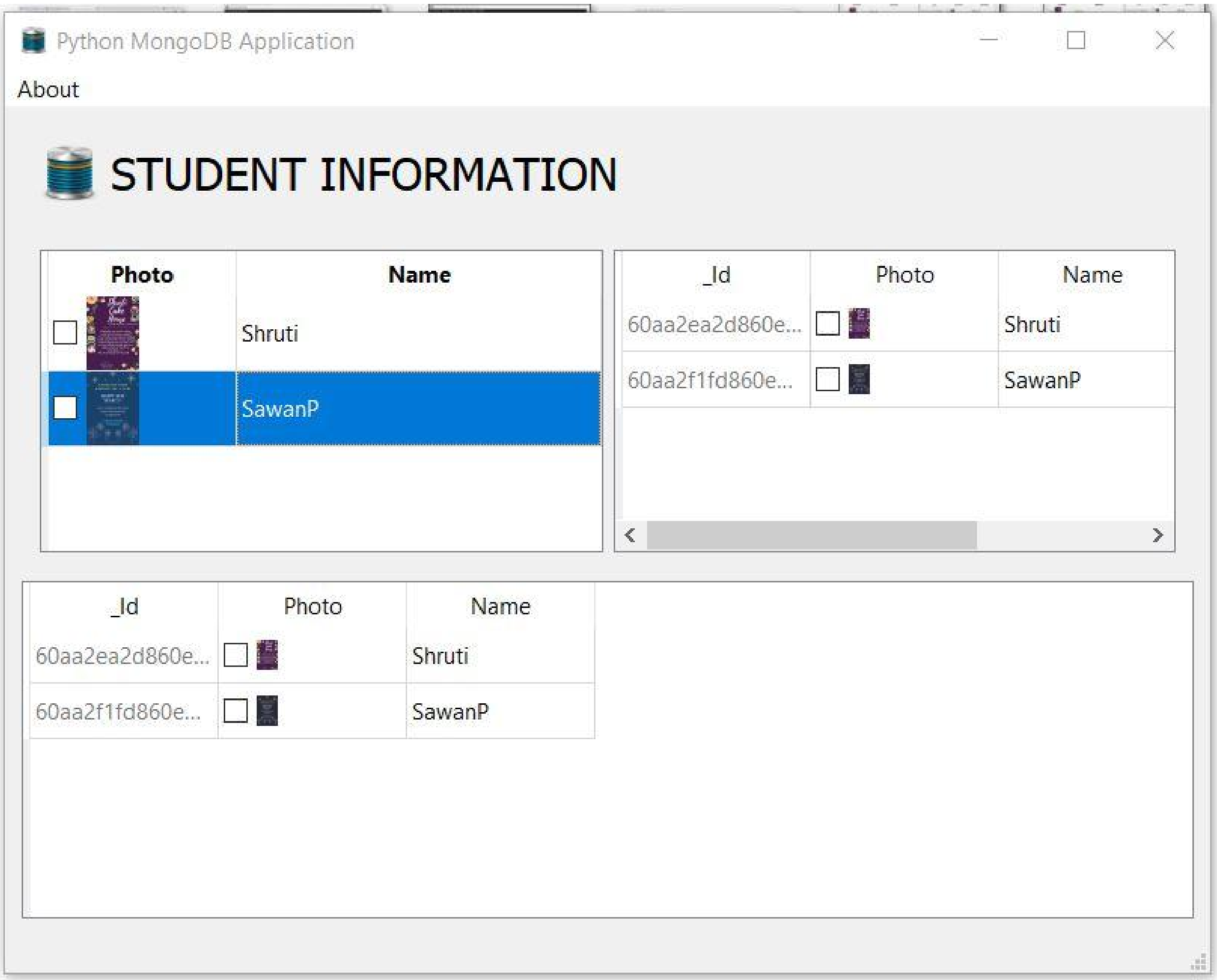
STUDENT INFORMATION

Photo	Name
☐	Shruti
☐	SawanP
☐	Shreya

_Id	Photo	Name
60aa2ea2d860e...	☐	Shruti
60aa2f1fd860e...	☐	SawanP
60aa8ac690769...	☐	Shreya

_Id	Photo	Name
60aa2ea2d860e...	☐	Shruti
60aa2f1fd860e...	☐	SawanP
60aa8ac690769...	☐	Shreya

DELETE Operation:



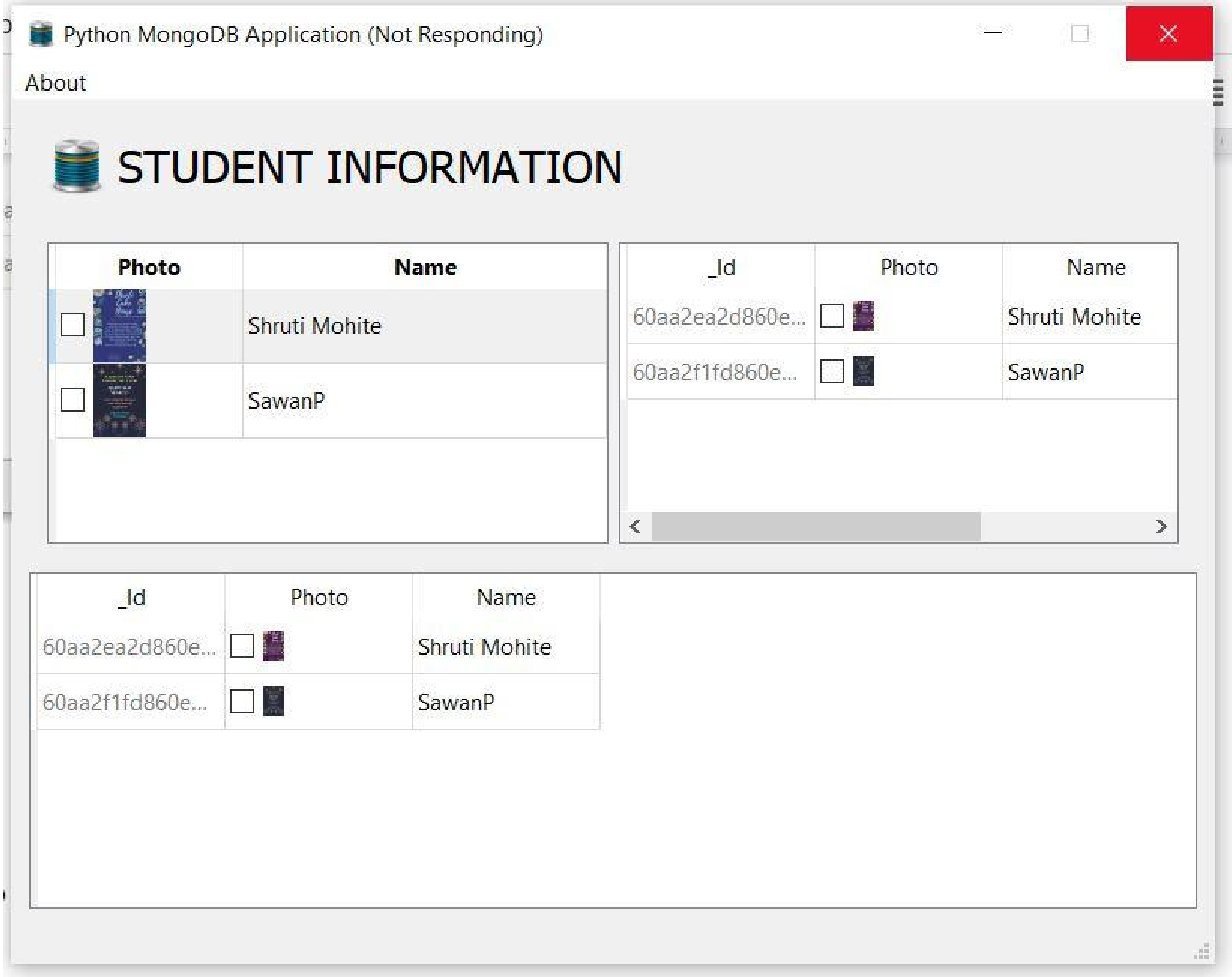
STUDENT INFORMATION

Photo	Name
□	Shruti
□	SawanP

_Id	Photo	Name
60aa2ea2d860e...	□	Shruti
60aa2f1fd860e...	□	SawanP

_Id	Photo	Name
60aa2ea2d860e...	□	Shruti
60aa2f1fd860e...	□	SawanP

UPDATE Operation:



STUDENT INFORMATION

Photo	Name
☐	Shruti Mohite
☐	SawanP

_Id	Photo	Name
60aa2ea2d860e...	☐	Shruti Mohite
60aa2f1fd860e...	☐	SawanP

_Id	Photo	Name
60aa2ea2d860e...	☐	Shruti Mohite
60aa2f1fd860e...	☐	SawanP

● Conclusion:

This project demonstrated desktop application for CRUD operations with MongoDB database.

● References:

1. https://www.guru99.com/nosql-tutorial.html
2. https://www.mongodb.com/1
3. https://cassandra.apache.org/