School of Information Technology
Department of Computer Science

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Faculty of Engineering, Built Environment and Information Technology

COS326 Database Systems:
Practical 8 2024

Release Date: 05 October 2024
Submission Date: 13 October 2024 @ 23:59
Lecturer: Mr S.M Makura

Total: 50 Marks

Objectives

1. Get exposure to the MongoDB document DBMS.
2. Learn how to create and use documents, collections and JavaScript functions for a MongoDB database.
3. Learn how to develop Java applications that access data in a MongoDB database.
4. Appreciate the differences between SQL and NoSQL databases.

For this practical exercise you will use the MongoDB database. When you are done:

Create a folder as follows:

The folder name should be ***uXXXXXXXX***(*XXXXXXXX is your student number)* and should contain the following sub-folders:

a. **Application: c**ontains your .jar file, as well as any other files necessaryto execute your application (this will be opened for marking).
b. **Source:** all your .java files go here (these files will also be checked during marking)

2. Create a zip file of the folder and upload it to ClickUP via the submission link for practical 8.
3. The practical will be marked through a live demo on Discord.

NO LATE submissions will be accepted after the submission date and time has lapsed. Do not wait till the last minute to submit and start giving excuses that you faced technical challenges when you tried to submit.

Task 1: JAVA APPLICATION TO PROCESS DATABASE DATA [50 marks]

a. Create MongoDB Database and Collection

- Using MongoDB, create a database called “**ecommercedb**” and a collection called “**products**”.

b. Import JSON Data [5 Marks]

- Use MongoDB Compass to import the data file “**EcommerceData.json**” (provided) into the “**products**” collection in your “**ecommercedb**” database.

c. Create a Java application using NetBeans or any Java IDE you prefer that does the following:

(i) Database Connection [5 Marks]

- Your application must connect to the “**ecommercedb**” database. Hint: Utilise the MongoDB Java driver as was demonstrated in the lecture.

(ii) GUI Button: "Get Product List" [10 Marks]

- Add a button called "Get Product List". When clicked, it should retrieve and display the list of products from the “products” collection in an appropriate GUI control.

(iii) GUI Button: "Count Products" [5 Marks]

- Add another button called "Count Products". When clicked, it should count the number of products in the “products” collection and display the count in an appropriate GUI control.

(iv) GUI Button: "Find Expensive Products" [10 Marks]

- Add another button called "Find Expensive Products". When clicked, it should retrieve and display products with a price greater than R500 in an appropriate GUI control.

(v) GUI Button: “Extract Reviews” [5 Marks]

Add another button called “Extract reviews” which when clicked, will do the following:

- Create a new collection called “**reviews**” in the “ecommercedb” database.
- Extract product reviews from the “**products**” collection and store objects of the form:

json

```
{
  "product_id": "Product ID",
  "product_name": "Product Name",
  "review": "Review Text",
  "rating": "Rating (1-5)"
}
```

- Display a message to the user to inform them that the collection has been added.

(vi) GUI Button: "View Reviews Collection" [5 Marks]

- Add another button called "View Reviews Collection". When clicked, it should retrieve and display all reviews in the Reviews collection. Use an appropriate GUI control to display the results.

(vii) GUI Button: "Get Collection Names" [5 Marks]

- Add another a button called "Get Collection Names". When clicked, it should retrieve the all the collection names from the database and display them on the screen.

Ensure your application handles any basic exceptions (e.g., connection issues, invalid input, missing collections, etc.). Full marks will be awarded for a fully functional Java application based on the given specifications.

[Total Marks: 50]