INFORMATICS INSTITUTE OF TECHNOLOGY IN COLLABORATION WITH UNIVERSITY OF WESTMINSTER(UOW)

B.Eng. (Hons) Software Engineering

5COSC020W Database Systems

Module Leader: Mr.Ragu Sivaraman

Individual Coursework (Part A)

Intermediary Report: PART I

Tutorial Group: G

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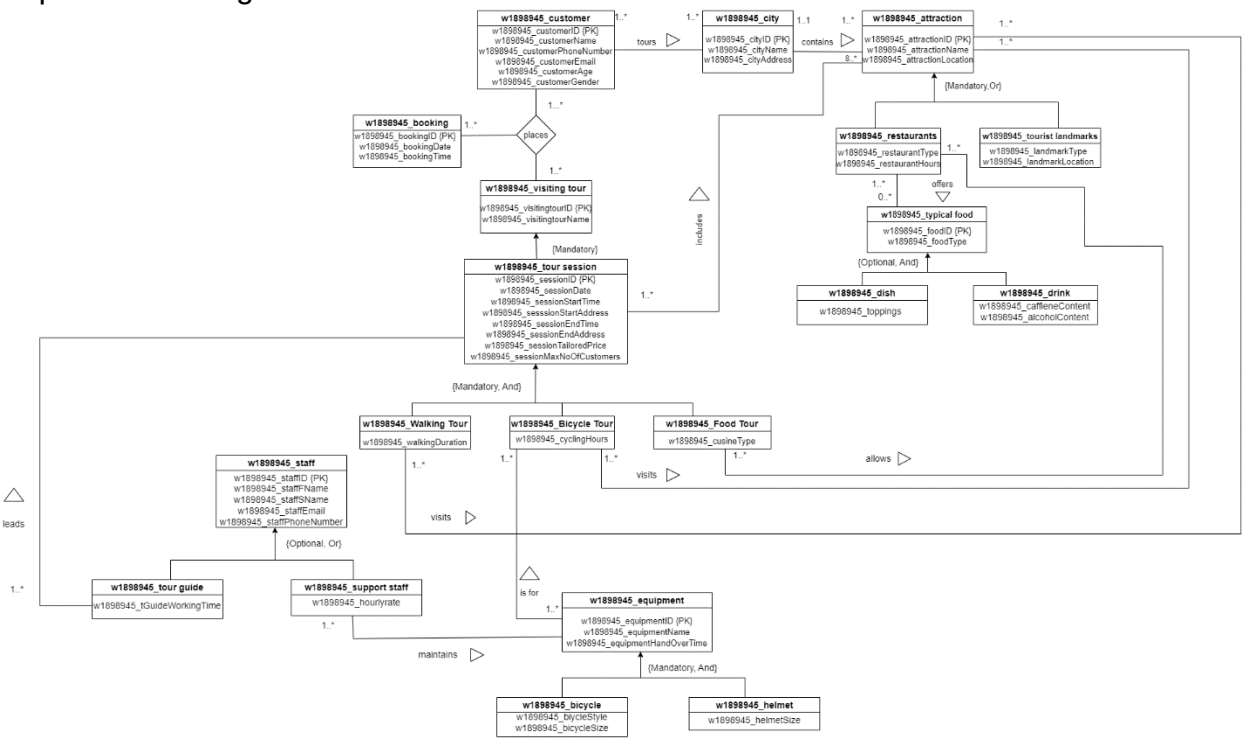
Date of Submission: 31/10/2022

Contents

PART A

1. Conceptual ERD diagram for Tourmato.



2. Data dictionary to justify the entities found for TOURMATO.

Entity Name	Brief Description
w1898945_Customer	This is a general term used to describe a customer in Tourmato who intends to make a visit to the tourist attractions around Europe countries.
w1898945_City	This is a general term used to describe a city to experience their unique atmospheres, under the direction of a local experienced tour guide.
w1898945_ Attractions	This is a general term used to describe multiple touristic attractions considered worth visiting.
w1898945_Visiting Tour	This is a general term used to describe to provide a range of experiences, every city covered by Tourmato
w1898945_Tour Guide	This is a general term used to describe naturally to lead the tour sessions: they take the customers around the city, stop at every attraction, and enthusiastically narrate key facts on the history, geography, architecture, ecology, or gastronomy for each visited attraction.
w1898945_Tourist Session	This is a general term used to describe a visiting tour that has been assigned a specific start date and time, a start address, an end date and time and an end address. Every tour session is also given a tailored price and a maximum number of customers that it can accommodate.
W1898945_Staff	This is a general term used to describe highly-trained employees with specialized roles at Tourmato.

General Entity	Specialised Entity	Explanation
w1898945_Equipment	w1898945_bicycle w1898945_helmet	This is a general term used to describe cycling session where Tourmato lends two main types of equipment for cycling tour sessions: bicycles and cycle helmets. Bicycles come in several styles and sizes, while helmets also have different sizes
w1898945_Typical Food	w1898945_dishes w1898945_drinks	This is a general term used to describe food tour session allow customers to stop at different restaurants and sample selected foods i.e., several dishes and/or drinks. It is possible for a walking tour session or a cycling tour session to also be a food tour session: in this case, customers will walk or ride between different attractions, see selected landmarks and stop at different restaurants to taste some of the nice foods on offer.
w1898945_Staff	w1898945_tour guide w1898945_support staff	The job of tour guides is naturally to lead the tour sessions: they take the customers around the city, stop at every attraction, and enthusiastically narrate key facts on the history, geography, architecture, ecology, or gastronomy for each visited attraction. Support staff also play a key role by ensuring the strict maintenance of all equipment used by Tourmato. Each member of the support staff is assigned the responsibility of several pieces of equipment to ensure that they are always kept in great condition.
w1898945_Tour Session	w1898945_walking tour w1898945_bicycle tour w1898945_food tour	Walking tour sessions are conducted on foot: customers visit the city by walking from one attraction to another. On cycling tour sessions, customers ride from one attraction to another on a bicycle. Finally, food tour sessions allow customers to stop at different restaurants and sample selected foods i.e., several dishes and/or drinks. It is possible for a walking tour session or a cycling tour session to also be a food tour session: in this case, customers will walk or ride between different attractions, see selected landmarks and stop at different restaurants to taste some of the nice foods on offer
w1898945_Attractions	w1898945_tourist landmarks w1898945_restaurants	Landmarks are simply relevant locations in the city that can be viewed, such as monuments, buildings, statues, squares, streets, parks, places of worship and so many more. Restaurants, on the other hand, offer interesting typical foods (dishes and/or drinks) to be sampled so that to allow people to experience the local culinary delicacies.

3. Data dictionary to justify the identified relationships and multiplicities for TOURMATO.

Entity name	Multiplicity	Relationship	Multiplicity	Entity name	Brief justifications for

					the multiplicity (4 statements for each relationship)
w1898945_Customer	1.. *	Tours	1.. *	City	Customer tours at least one city. One customer tour many cities. One city can be toured by at least one customer. One city can be toured by many customers.
w1898945_City	1..1	Contains	1.. *	w1898945_attractions	One city contains at least one tourist attraction. One city contains many tourist attractions. One tourist attraction can contain one city. One tourist attraction can contain maximum of one city.
w1898945_Tour session	1.. *	Includes	8.. *	w1898945_attractions	One tour session includes at least one tourist attraction. One tour session includes many tourist attractions. One tourist attraction can include one tour session. One tourist attraction can include maximum of one tour session.
w1898945_Tour guide	1.. *	Leads	0.. *	w1898945_Tour Session	Tour guide leads at least one tour session. One Tour guide leads many tours session. One Tour session lead by a tour guide. One tour session can be led by a maximum of one tour guide.
w1898945_Restaurants	1.. *	Offers	0.. *	w1898945_Typical Food	One restaurant offers at least one type of food. One restaurant offers many types of food.

					A particular food offered by at least one restaurant. A particular food can be offered by a maximum of one restaurant.
w1898945_Support Staff	1.. *	Maintains	1.. *	w1898945_Equipment	One support staff maintains at least one equipment. One support staff maintains many equipment. An equipment is maintained by at least one support staff An equipment can be maintained by a maximum of one support staff.
w1898945_Bicycle Tour	1.. *	Visits	1.. *	W1898945_Attractions	One bicycle tour visits at least one attraction location. One bicycle tour can visit many attractions location. An attraction location is visited by at least one bicycle tour. An attraction location can be visited by a maximum of one bicycle tour.

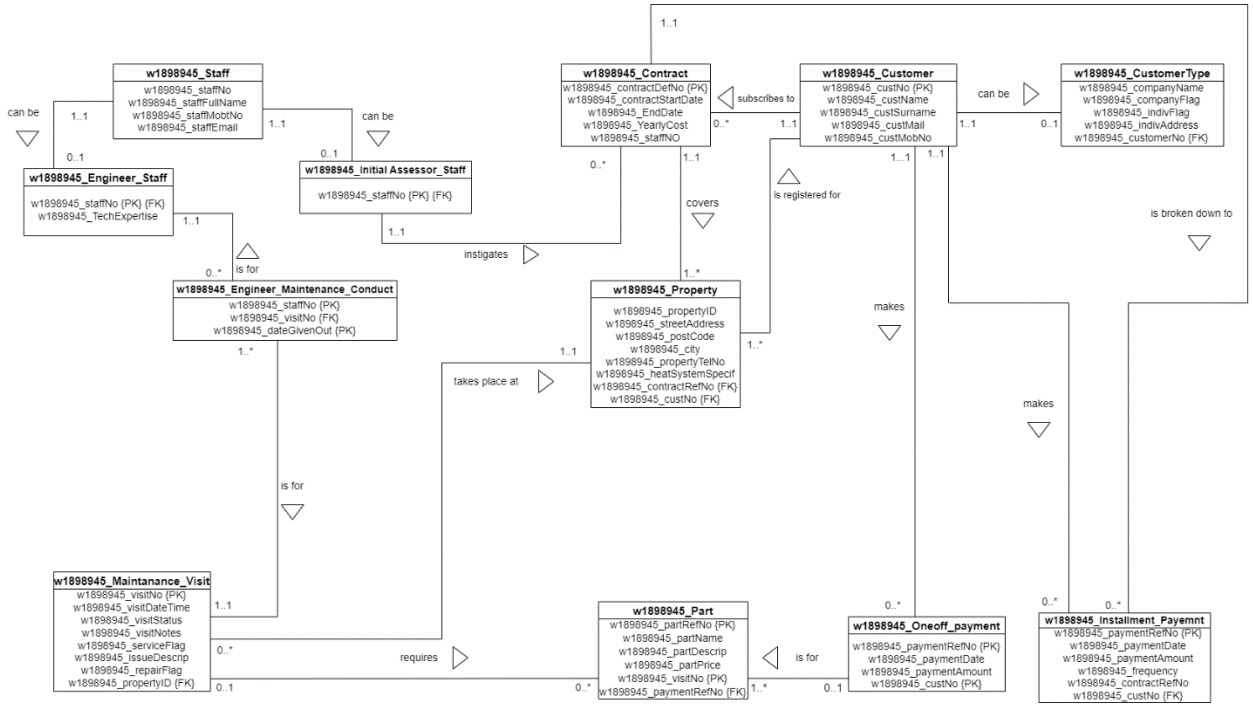
4. Data Dictionary to document how you identified the attributes and primary keys for each entity for Tourmato.

Entity name	Attributes for this entity (include PK)	Brief explanation
w1898945_Customer	w1898945_customerID {PK}	Uniquely identifies a customer and this is the primary key for the customer entity. (Primary key)
	w1898945_customerName	Defines the name of customer
	w1898945_customerAddress	Defines the information of the customer's address.
	w1898945_customerPhoneNumber	Defines the contact number of the customer.
w1898945_City	w1898945_cityID {PK}	Uniquely identifies a city and this is the primary key for the city entity. (Primary key)
	w1898945_cityName	

	w1898945_cityAddress	Defines the name of city. Defines the information of the city's address
w1898945_Tour session	w1898945_sessionID {PK} w1898945_sessionDate w1898945_sessionStartTime w1898945_sessionStartAddress w1898945_sessionEndTime w1898945_sessionEndAddress w1898945_sessionTailoredPrice	Uniquely identifies a session and this is the primary key for the session entity. (Primary key) Defines the confirmed date of session. Defines the confirmed start time of session. Defines the confirmed start address of session. Defines the confirmed end time of session. Defines the confirmed end time of session. Defines the confirmed tailored price of session.
w1898945_Staff	w1898945_staffID {PK} w1898945_staffFName w1898945_staffSName w1898945_staffEmail w1898945_staffPhoneNumber	Uniquely identifies a staff and this is the primary key for the staff entity. (Primary key) Defines the First name of staff. Defines the Surname name of staff. Defines the Email of staff. Defines the contact number of the staff.
w1898945_Equipment	w1898945_equipmentID {PK} w1898945_equipmentName w1898945_equipmentHandOverTime	Uniquely identifies an equipment and this is the primary key for the equipment entity. (Primary key) Defines the name of the equipment. Defines the due time of the equipment.
w1898945_typical food	w1898945_foodID {PK} w1898945_food type	Uniquely identifies a food and this is the primary key for the food entity. (Primary key) Defines the different types of food.
w1898945_Attractions	w1898945_attractionID {PK} w1898945_attractionName w1898945_attractionLocation	Uniquely identifies an attraction and this is the primary key for the attraction entity. (Primary key) Defines the name of an attraction. Defines the location of an attraction.

w1898945_Booking	w1898945_bookingID {PK} w1898945_bookingDate w1898945_bookingTime	Uniquely identifies the booking of the tour and this is the primary key for the booking entity. (Primary key) Defines the date of booking of the tour. Defines the time of booking of the tour.
w1898945_Visiting Tour	w1898945_visiting tourID {PK} w1898945_visiting tourName	Uniquely identifies the visiting tour and this is the primary key for the visiting tour. (Primary key) Defines the name of the visiting tour.

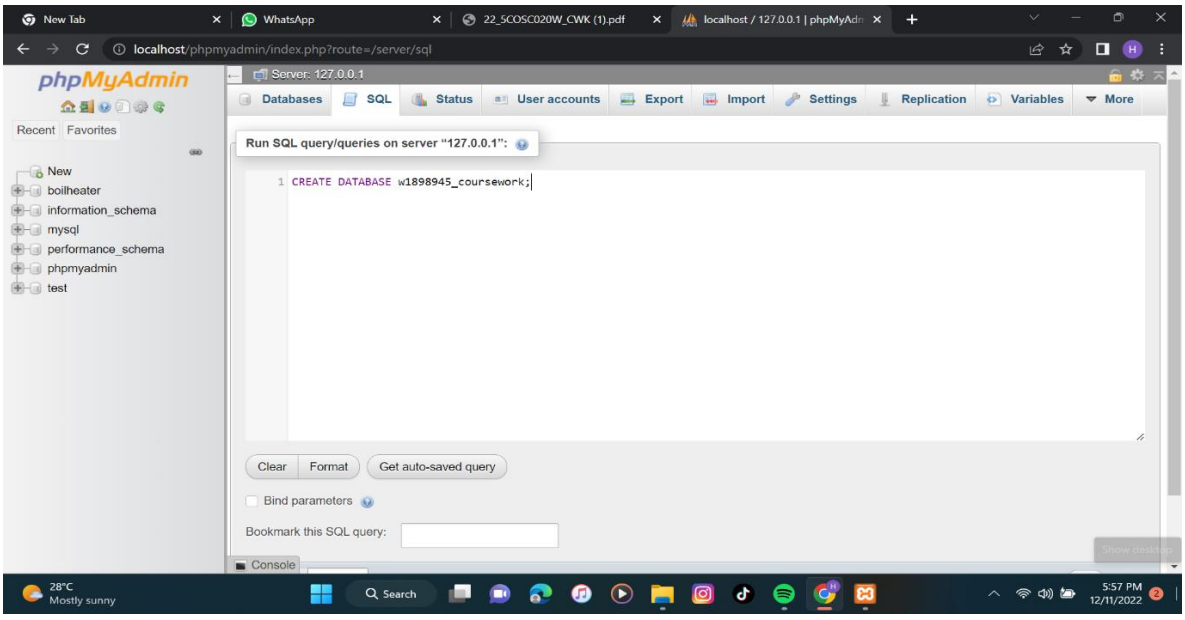
5. THE LOGICAL EERD

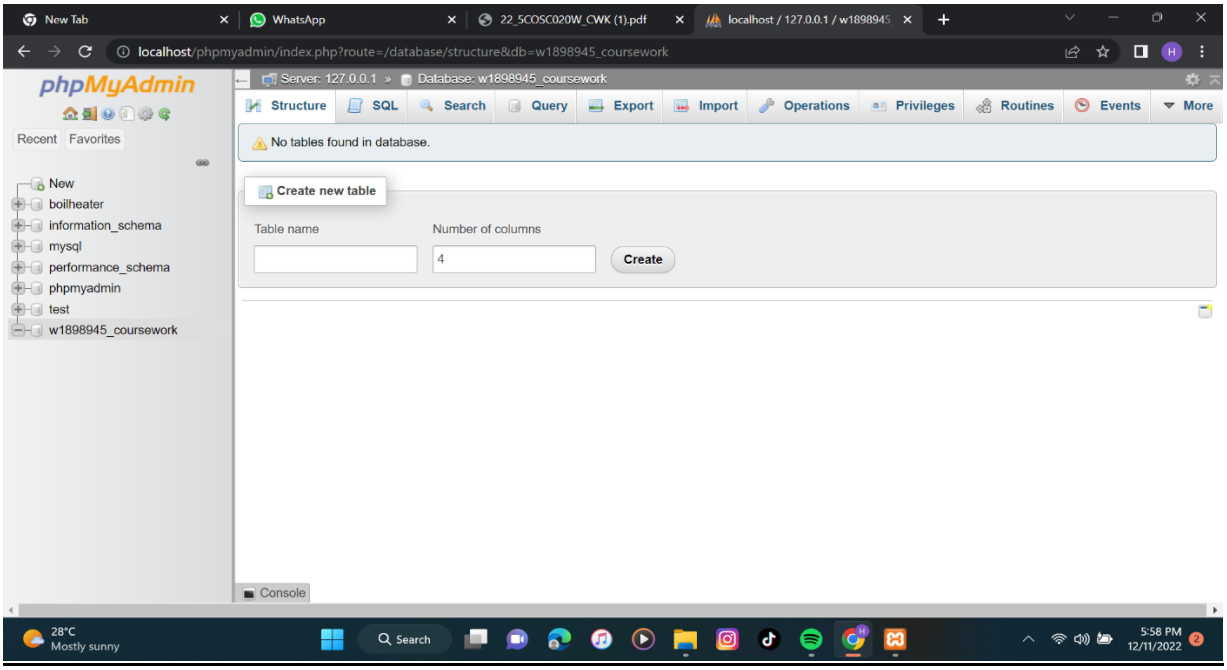


6. SQL QUERY

1. Creating Database

Code > CREATE DATABASE w1898945_coursework;

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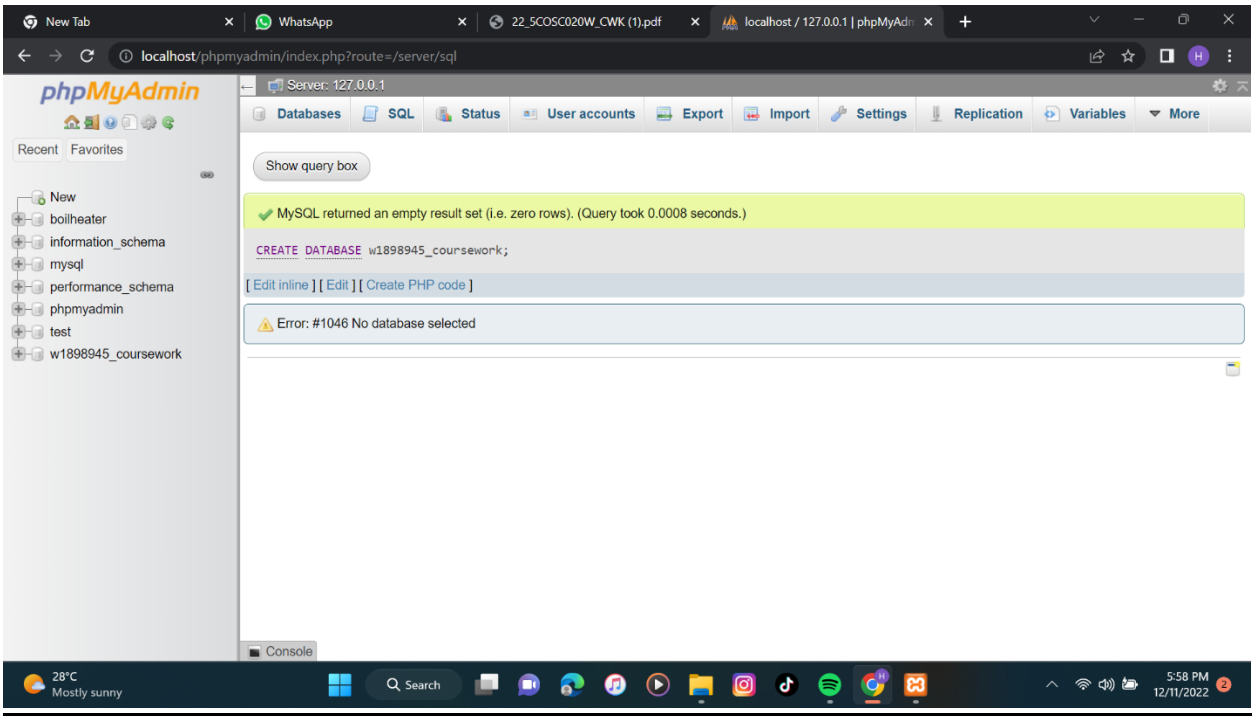
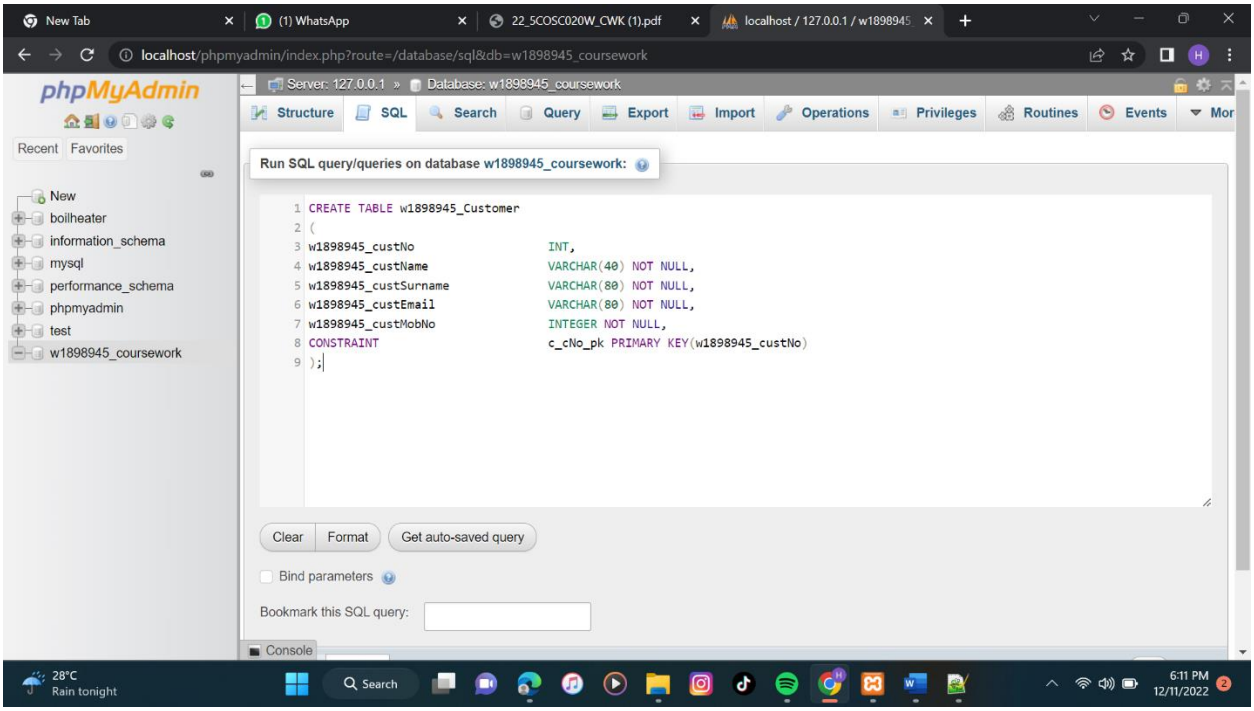
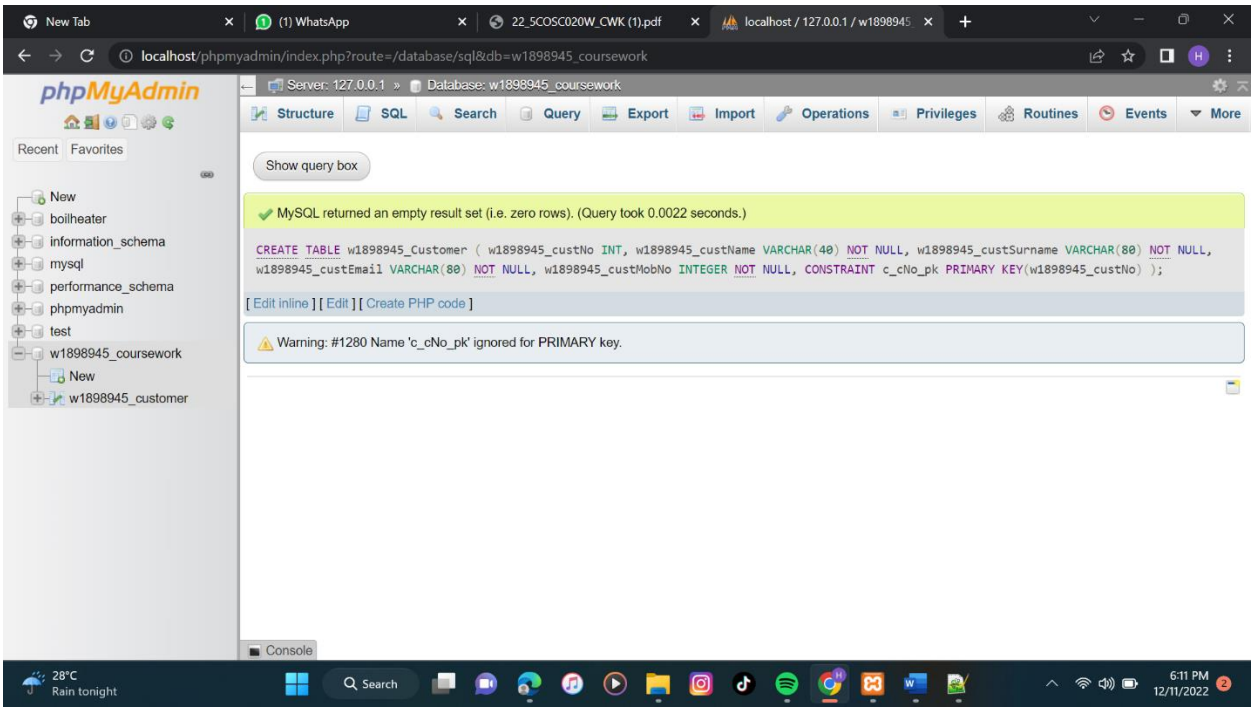
WhatsApp
22_5COSC020W_CWK (1).pdf
localhost / 127.0.0.1 / w1898945
localhost/phpmyadmin/index.php?route=/database/structure&db=w1898945_coursework
phpMyAdmin
Recent
Favorites
New
boilheater
information_schema
mysql
performance_schema
phpmyadmin
test
w1898945_coursework
Server: 127.0.0.1 » Database: w1898945_coursework
Structure
SQL
Search
Query
Export
Import
Operations
Privileges
Routines
Events
More
No tables found in database.
Create new table
Table name
Number of columns
4
Create
Console
28°C
Mostly sunny
Search
5:58 PM
12/11/2022

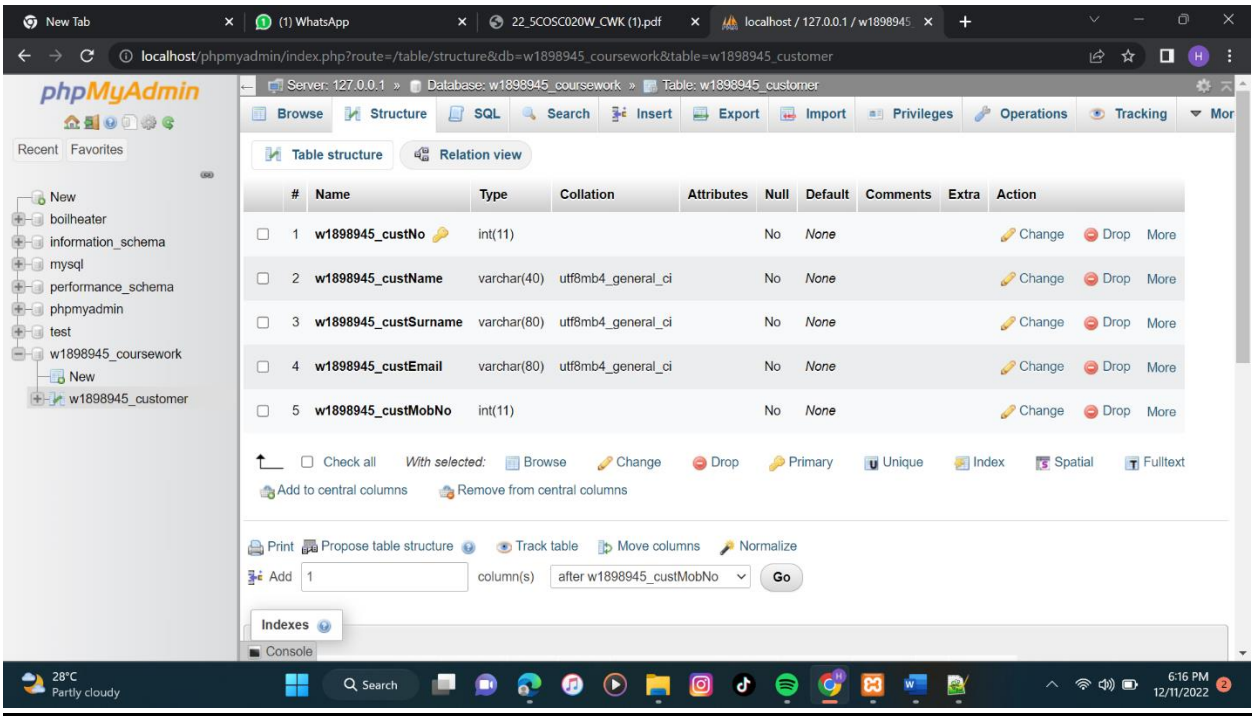

New Tab
WhatsApp
22_5COSC020W_CWK (1).pdf
localhost / 127.0.0.1 | phpMyAdn
localhost/phpmyadmin/index.php?route=/server/sql
phpMyAdmin
Recent
Favorites
New
boilheater
information_schema
mysql
performance_schema
phpmyadmin
test
w1898945_coursework
Server: 127.0.0.1
Databases
SQL
Status
User accounts
Export
Import
Settings
Replication
Variables
More
Show query box
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0008 seconds.)
CREATE DATABASE w1898945_coursework;
[Edit inline] [Edit] [Create PHP code]
Error: #1046 No database selected
Console
28°C
Mostly sunny
Search
5:58 PM
12/11/2022

2. Creating the tables and populating the tables.

```
CREATE TABLE w1898945_Customer
(
w1898945_custNo             INT,
w1898945_custName           VARCHAR (40) NOT NULL,
w1898945_custSurname        VARCHAR (80) NOT NULL,
w1898945_custEmail          VARCHAR (80) NOT NULL,
w1898945_custMobNo          TEGER NOT NULL,
CONSTRAINT                  c_cNo_pk PRIMARY KEY(w1898945_custNo)
);
```




New Tab
(1) WhatsApp
22_5COSC020W_CWK (1).pdf
localhost / 127.0.0.1 / w1898945
localhost/phpmyadmin/index.php?route=/database/sql&db=w1898945_coursework
phpMyAdmin
Recent
Favorites
New
boilheater
information_schema
mysql
performance_schema
phpmyadmin
test
w1898945_coursework
New
w1898945_customer
Server: 127.0.0.1 » Database: w1898945_coursework
Structure
SQL
Search
Query
Export
Import
Operations
Privileges
Routines
Events
More
Show query box
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0022 seconds.)
CREATE TABLE w1898945_Customer (w1898945_custNo INT, w1898945_custName VARCHAR(40) NOT NULL, w1898945_custSurname VARCHAR(80) NOT NULL, w1898945_custEmail VARCHAR(80) NOT NULL, w1898945_custMobNo INTEGER NOT NULL, CONSTRAINT c_cNo_pk PRIMARY KEY(w1898945_custNo));
[Edit inline] [Edit] [Create PHP code]
Warning: #1280 Name 'c_cNo_pk' ignored for PRIMARY key.
Console
28°C
Rain tonight
Search
6:11 PM
12/11/2022


New Tab
(1) WhatsApp
22_5COSC020W_CWK (1).pdf
localhost / 127.0.0.1 / w1898945
localhost/phpmyadmin/index.php?route=/table/structure&db=w1898945_coursework&table=w1898945_customer
phpMyAdmin
Recent
Favorites
New
boilheater
information_schema
mysql
performance_schema
phpmyadmin
test
w1898945_coursework
New
w1898945_customer
Server: 127.0.0.1 » Database: w1898945_coursework » Table: w1898945_customer
Browse
Structure
SQL
Search
Insert
Export
Import
Privileges
Operations
Tracking
Table structure
Relation view
Name Type Collation Attributes Null Default Comments Extra Action
1 w1898945_custNo int(11) No None Change Drop More
2 w1898945_custName varchar(40) utf8mb4_general_ci No None Change Drop More
3 w1898945_custSurname varchar(80) utf8mb4_general_ci No None Change Drop More
4 w1898945_custEmail varchar(80) utf8mb4_general_ci No None Change Drop More
5 w1898945_custMobNo int(11) No None Change Drop More
Check all
With selected:
Browse
Change
Drop
Primary
Unique
Index
Spatial
Fulltext
Add to central columns
Remove from central columns
Print
Propose table structure
Track table
Move columns
Normalize
Add 1 column(s) after w1898945_custMobNo Go
Indexes
Console
28°C
Partly cloudy
Search
6:16 PM
12/11/2022

Code > INSERT INTO w1898945_customer (w1898945_custNo,w1898945_custName,w1898945_custSurname,w1898945_custEmail,w1898945_custMobNo)

VALUES('01','deverakonda','vijay','thedeverakonda@gmail.com','0923451004'),

('02','peter','parker','ptrparker@gmail.com','0856732879'),

('03','hasni','haleem','hashal@gmail.com','0789045123'),

('04','arjun','reddy','arjunreddy17@gmail.com','0913458944'),

('05','shreya','goshal','shregoshal145@gmail.com','0768901123'),

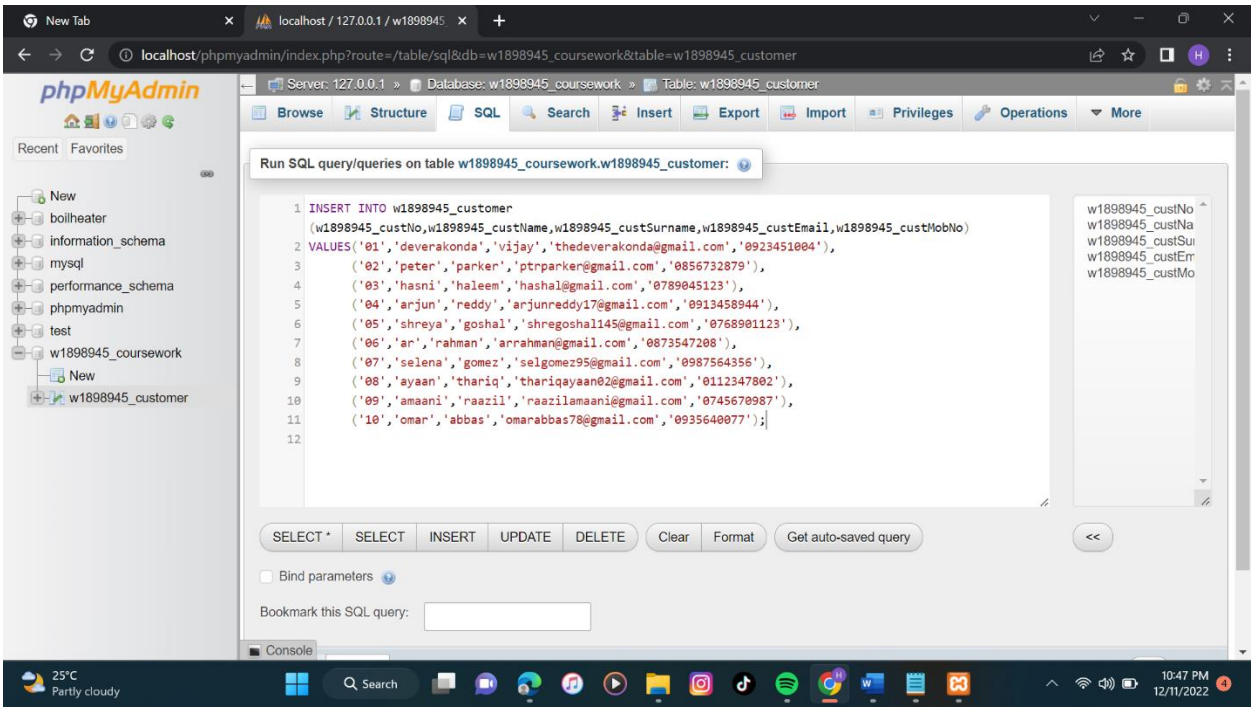
('06','ar','rahman','arrahman@gmail.com','0873547208'),

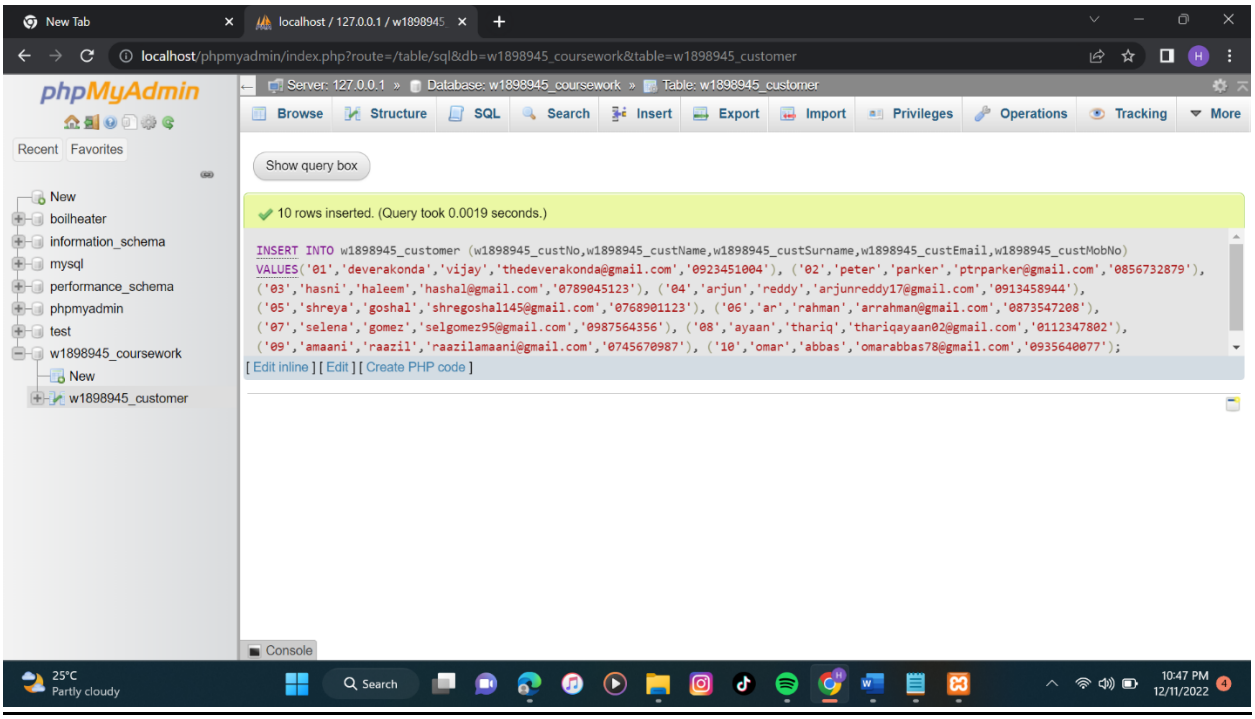
('07','selena','gomez','selgomez95@gmail.com','0987564356'),

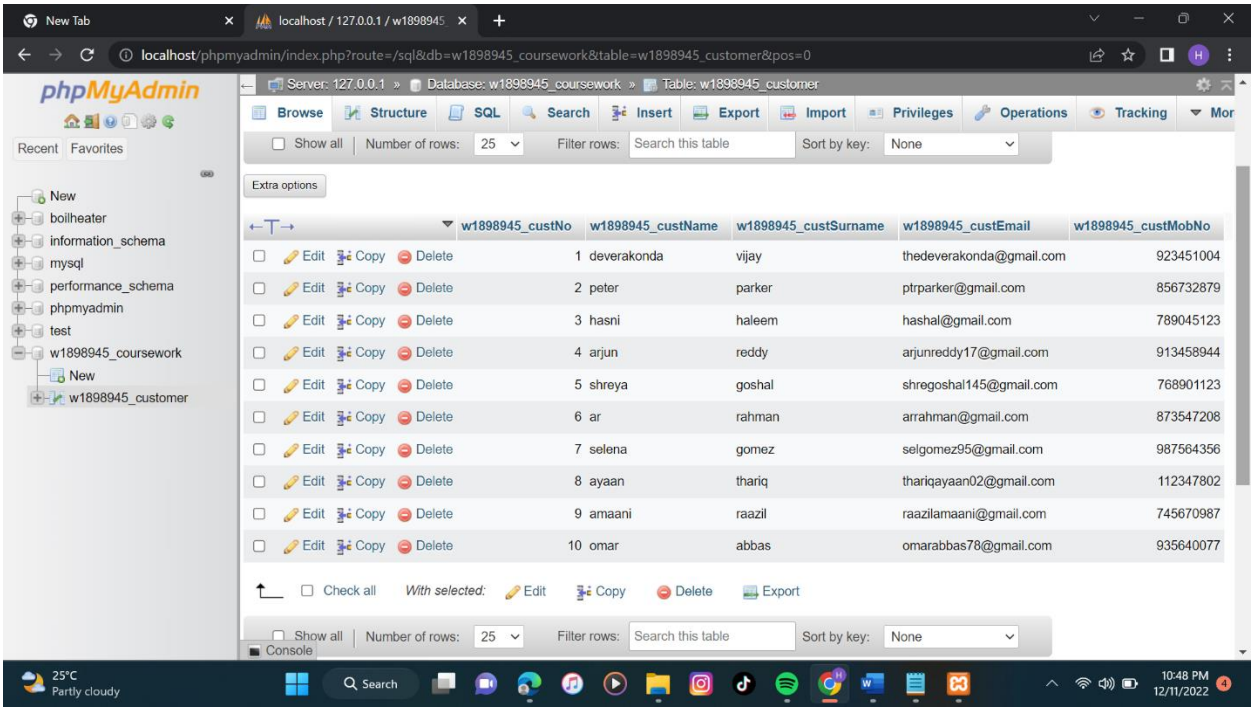
('08','ayaan','thariq','thariqayaan02@gmail.com','0112347802'),

('09','amaani','raazil','raazilamaani@gmail.com','0745670987'),

('10','omar','abbas','omarabbas78@gmail.com','0935640077');



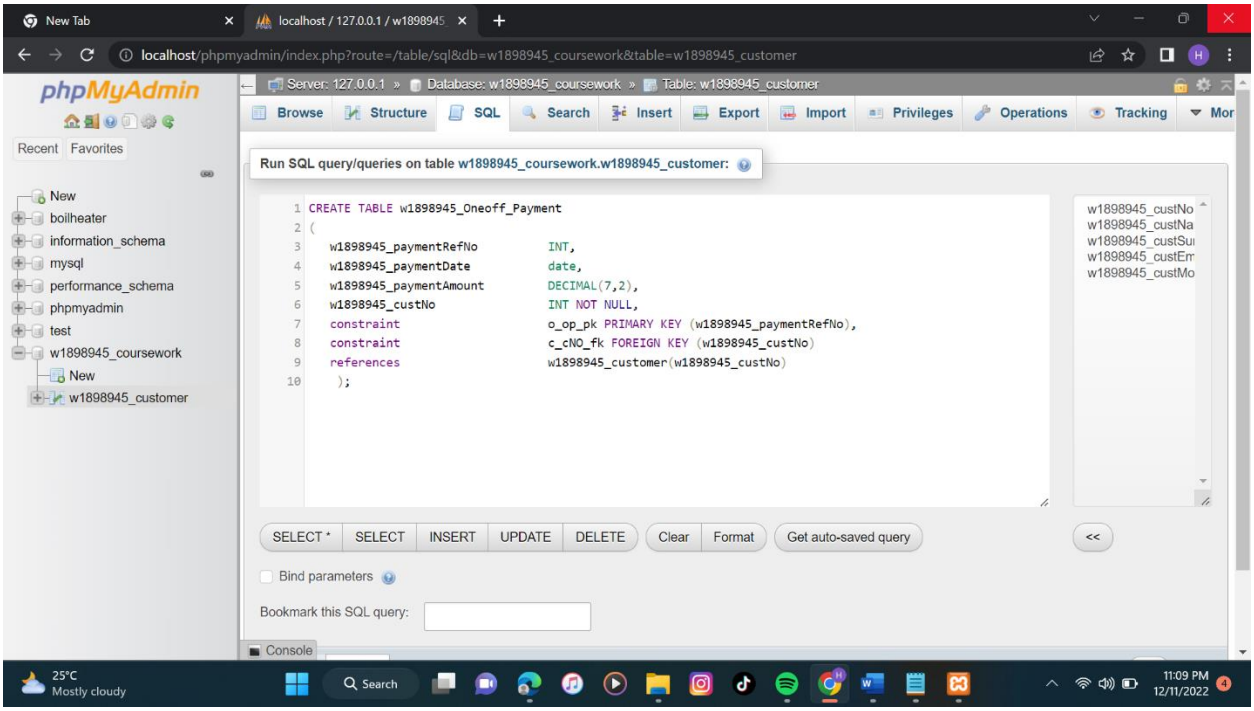


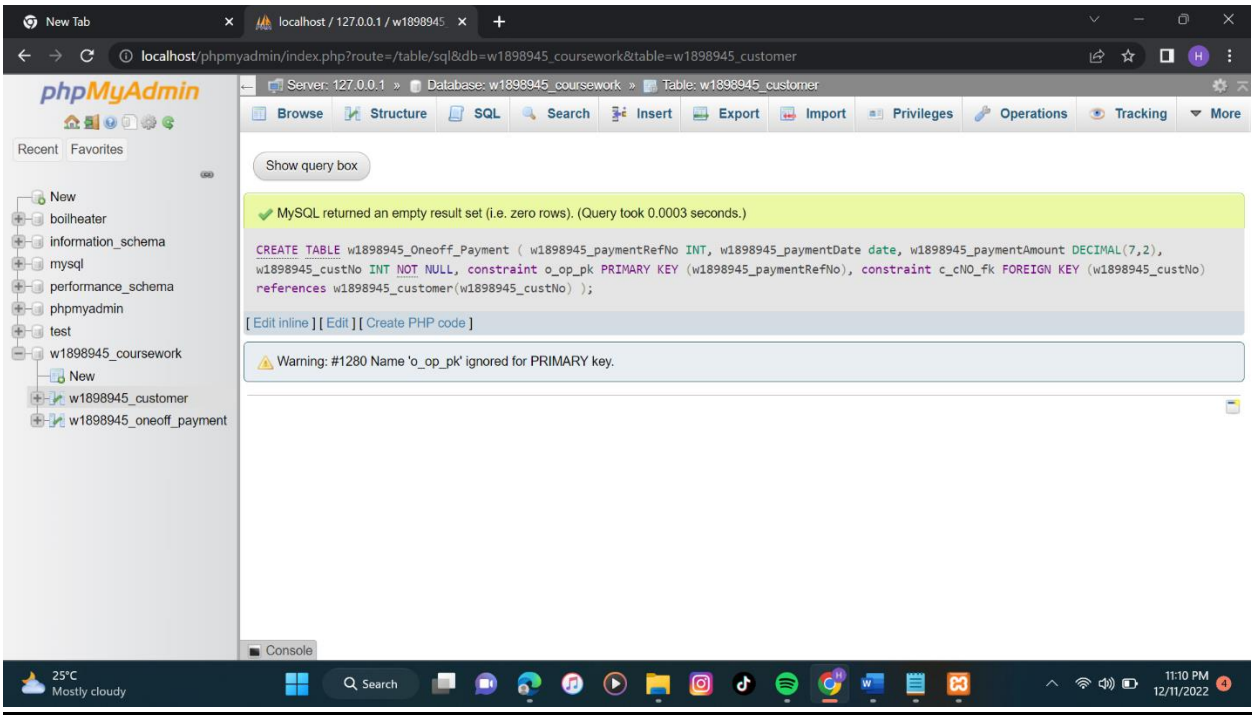


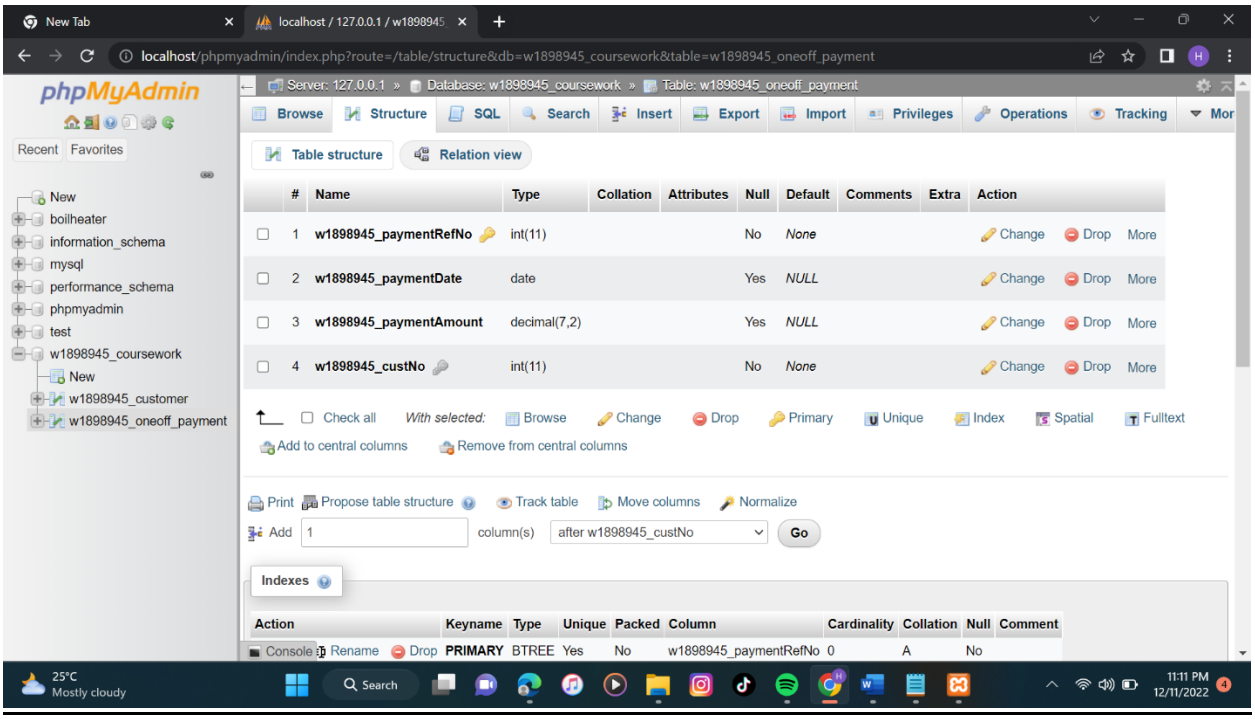
3. Creating Oneoff_payment table and populating the table.

```
CREATE TABLE w1898945_Oneoff_Payment
(
```

```
w1898945_paymentRefNo        INT,
w1898945_paymentDate         date,
w1898945_paymentAmount       DECIMAL(7,2),
w1898945_custNo              INT NOT NULL,
constraint                   o_op_pk PRIMARY KEY (w1898945_paymentRefNo),
constraint                   c_cNO_fk FOREIGN KEY (w1898945_custNo)
references                   w1898945_customer(w1898945_custNo)
 );
```

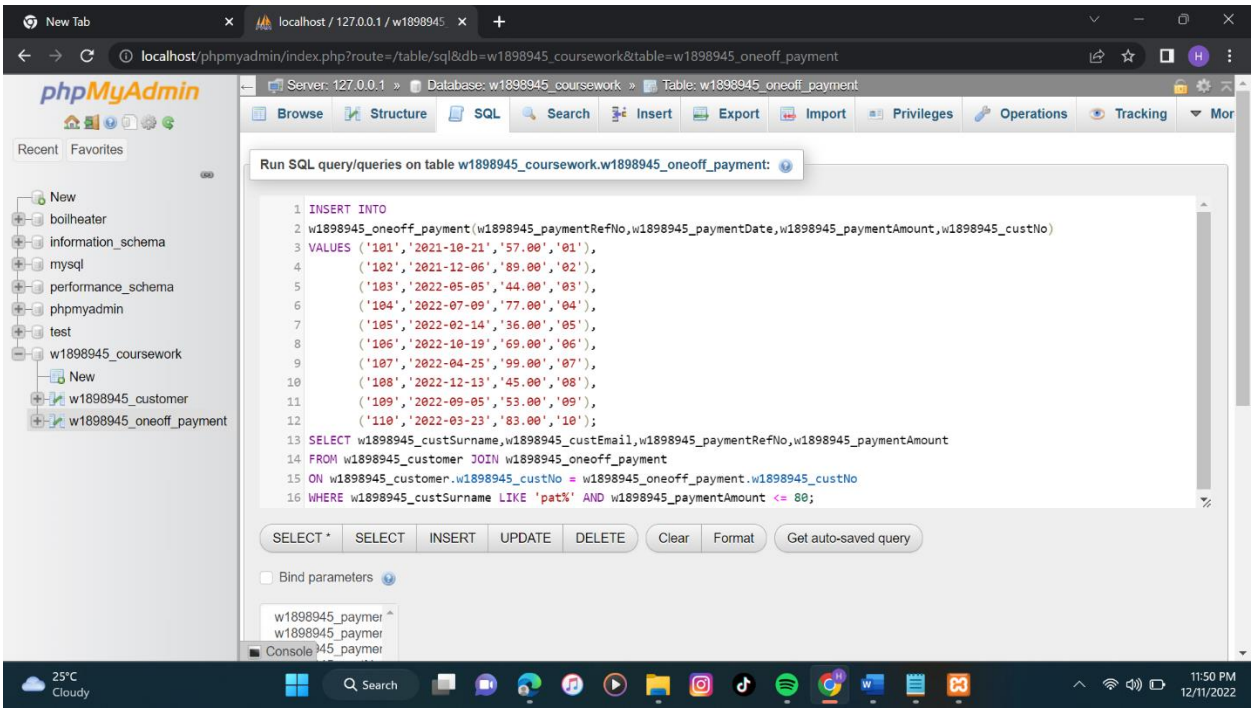


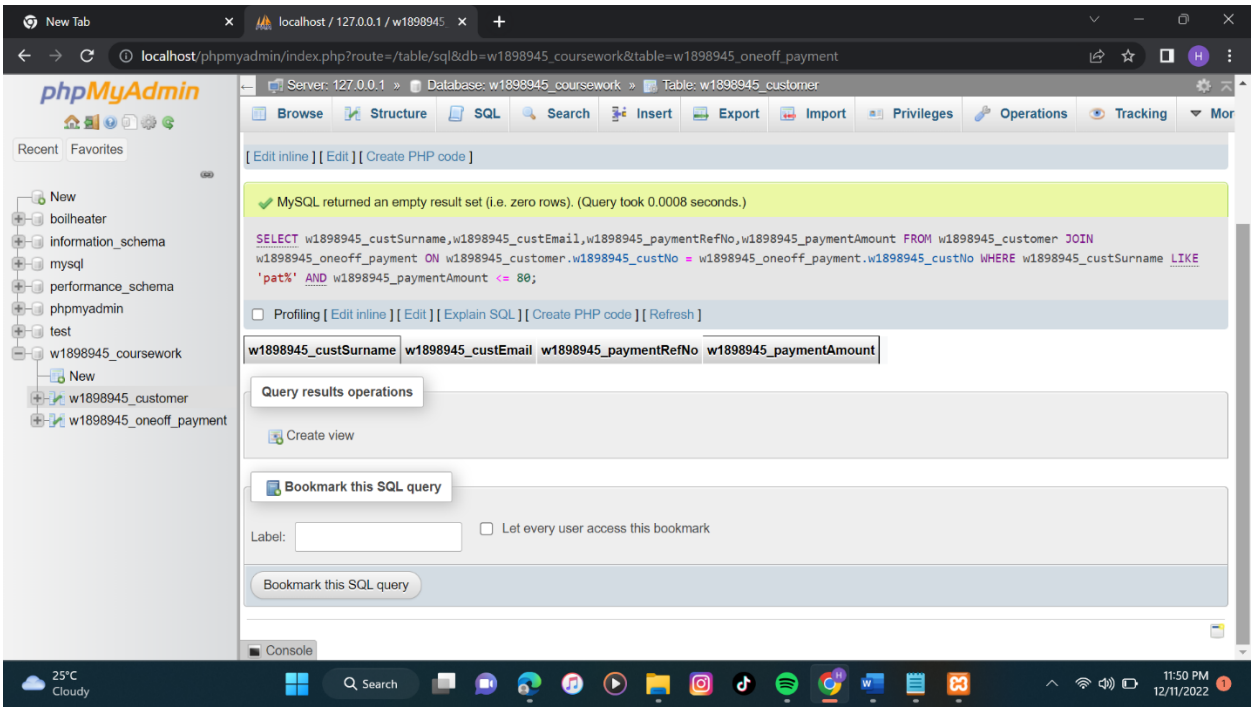


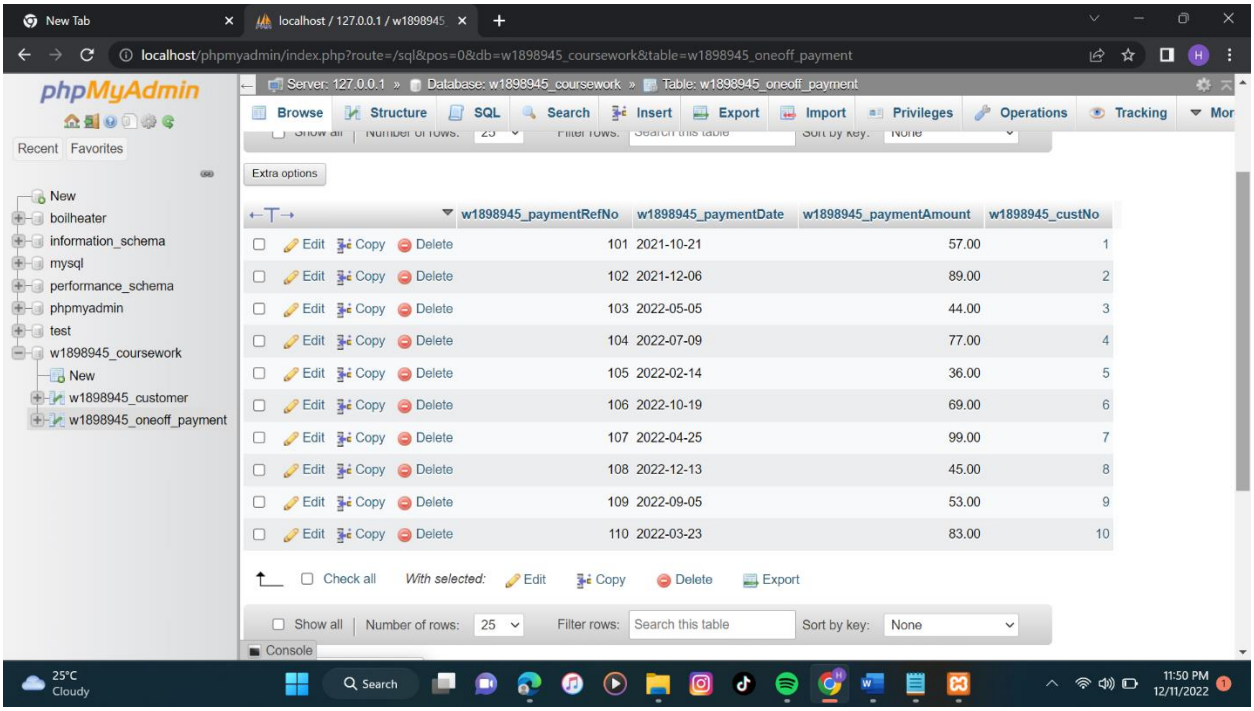



```
INSERT INTO
w1898945_oneoff_payment(w1898945_paymentRefNo,w1898945_paymentDate,w1898945_paymentAmount,w1898945_custNo)
VALUES ('101','2021-10-21','57.00','01'),
    ('102','2021-12-06','89.00','02'),
```

```
('103','2022-05-05','44.00','03'),
('104','2022-07-09','77.00','04'),
('105','2022-02-14','36.00','05'),
('106','2022-10-19','69.00','06'),
('107','2022-04-25','99.00','07'),
('108','2022-12-13','45.00','08'),
('109','2022-09-05','53.00','09'),
('110','2022-03-23','83.00','10');
SELECT
w1898945_custSurname,w1898945_custEmail,w1898945_paymentRefNo,w1898945_p
aymentAmount
FROM w1898945_customer JOIN w1898945_oneoff_payment
ON w1898945_customer.w1898945_custNo =
w1898945_oneoff_payment.w1898945_custNo
WHERE w1898945_custSurname LIKE 'pat%' AND w1898945_paymentAmount <= 80;
```



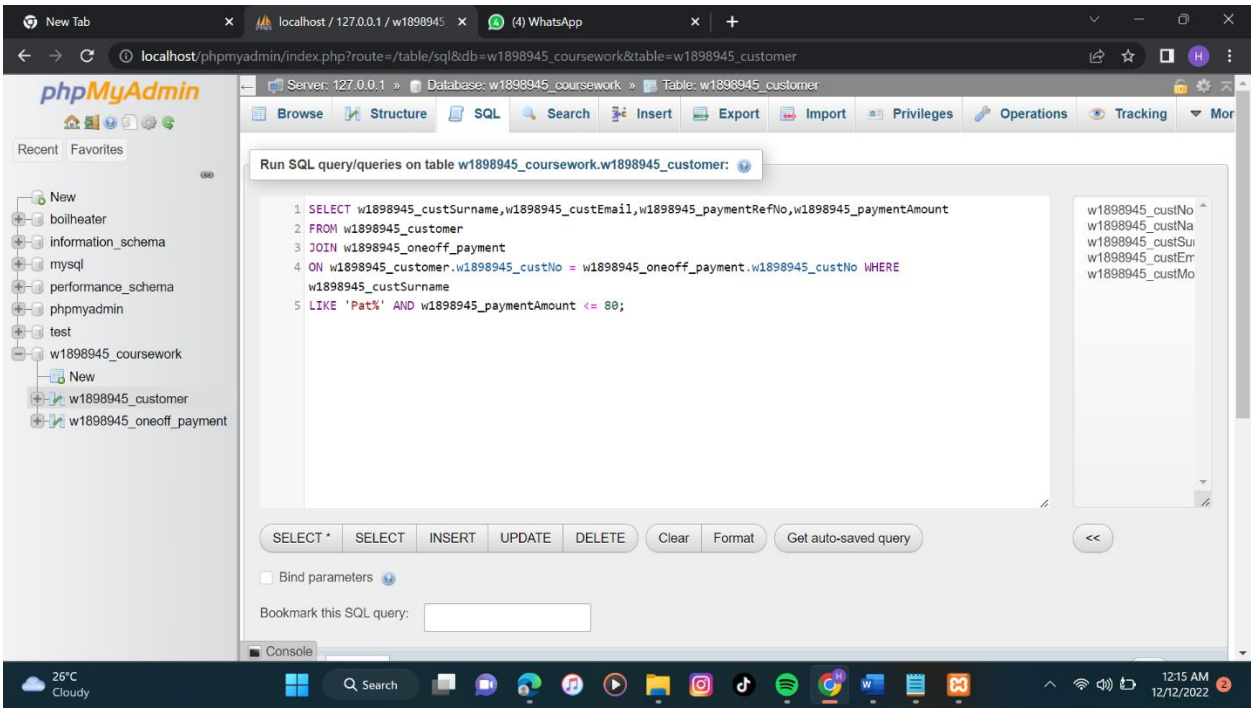


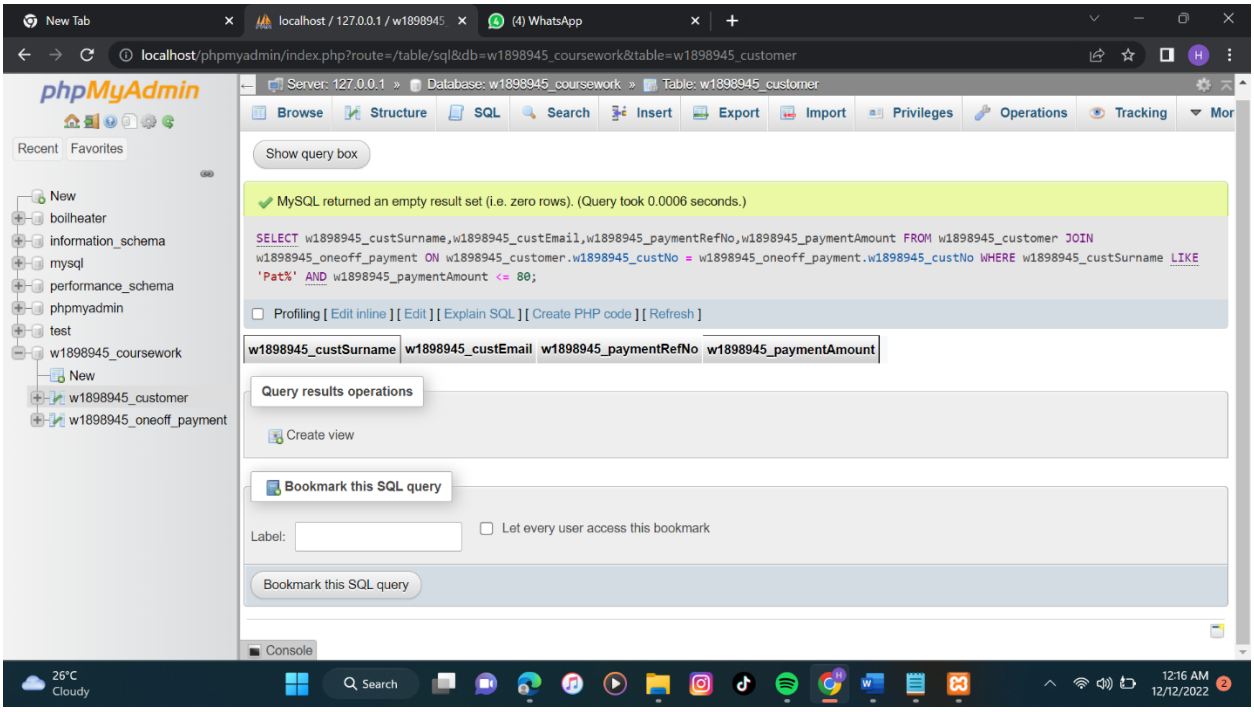


7.SQL Query to select the records with the given conditions.

Code>SELECT
w1898945_custSurname,w1898945_custEmail,w1898945_paymentRefNo,w1898945_payment Amount
FROM w1898945_customer
JOIN w1898945_Oneoff_payment

ON w1898945_customer.w1898945_custNo = w1898945_oneoff_payment.w1898945_custNo
WHERE w1898945_custSurname
LIKE 'Pat%' AND w1898945_paymentAmount <= 80;





Area	MySQL	MongoDB
1. Introduction	Organizing and storing data, MySQL is a free and open-source relational database management system. Data in tables with associated data types using structured query language. 2022 (Acharya) Data is kept in tabular form with columns and rows, and a different key is used for each row. (2022 Taylor)	An open-source NoSQL database management system is MongoDB. which stores and employs document-oriented methods. Data retrieval. Data is kept as collections of documents. (2022 Taylor)
2. Schemas	In MySQL, the schema must be defined before any data is added to the database. MySQL requires a necessary pre-establishment on how tables are built before data can be stored there. A stable schema for the user is preferable. (Franco & Berga, 2021)	Because MongoDB permits the usage of unstructured data, users may create applications. without previously specifying the schema. Enables users to quickly integrate and store various sorts of data and dynamically change the structure without experiencing any downtime. Users can access pre-defined structures using MongoDB. Franco and Berga, 2021
3. Data Consistency.	Data consistency in MySQL is high as data duplication does not happen.	Data consistency in MongoDB is relatively low-level.
4. Storage.	Rows and columns make up tables in which MySQL stores data. Every data connection adheres to a rigid logical organization. (Meher, 2021)	Data is kept as documents and collections in MongoDB. Collection includes written materials. This has key-value pairs representing the basic data components. (Meher, 2021)
5. Performance.	MySQL performs great in transactional operations.	MongoDB performs better on unstructured data as it is based on document-based system.
6. Workload.	For high-performance joins across several tables, MySQL is designed. (Anon., 2022) MySQL can map intricate data relationships	MongoDB's writing speed is comparatively quick. (Anon., 2022) Data-wise, MongoDB is superior.

		data mining and analysis.
7. Security.	MySQL offers standard security measures such as normal encryption for the community edition. For enterprise edition it provides more security features such as authentication, TDE, masking, firewall etc. (Anon., 2022)	MongoDB provides security features like authentication, access control (user, role-based access control), and encryption (TLS/SSL) for sensitive data. (Anon., 2022)

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