Welcome To Module Two

module two contains everythig related to database

Table of content :-

What is data?

Data is a collection of facts, numbers, words, or other information that can be used for analysis or decision making.

What is Database?

A database is *an organized collection of structured information, or data*, typically stored electronically in a computer system.

in this course we will learn about relational database , its database that uses sql(structured query language) as intruction to do to something.

UI of the mysql databse in xampp

we will do the following :-

- create database
- create table (primary key,not null) , but before creating table we need to understand data types in sql(nocyada xogta ay noqonayso)
  - primary key : primary key is not data type , its responsible to reduce redunance of data inside the database.
  - numeric : this data type represent everything related to numbers as integer , double,float.
  - String : this data type represent every thing related to text such as character(hal xaraf kaliya tusale 'A') or varchar(qoral dhamaystiran , tusale mustafe)
  - Date : this data type represent date (qaabka date loo qoro aya ah manlinta/bisha/sanadka = 01/23/2024)

  - Time : this data type represent time (10:00),
  - Time Stamp : is date and time combined , usually database create thier own date and time.

- insert data into table
- display all data
- update table data
- delete table data
- add new column to your table
- delete column from your table

Structure Query Language (SQL)

1- create database using sql

```
create database name_of_the_database;
```

2- create table using sql and understanding data type

```
create table name_of_the_table(studentid int(4) primary key ,
studentname varchar(50)not null ,marks character(2) not null , dob date);
```

3- insert data into table

```
insert into table_name(studentid,studentname,marks,dob)values(1001,
'mustafe kaahin','A', '2024/11/23');
```

4- select and where clause

```
// query 1
select * from table_name;

//query 2
select * from table_name where condition ;
```

5- update data inside table

```
update table table_name set studentname = 'abdi warfaa'
where studentid = 1001
```

6- delete data inside the table

```
delete from table_name where studentid = 1001;
```

7- count function in sql

```
select count(*) from table_name;
```

8- sum function in sql (gets total of added number)

```
select sum(attribute) from table_name;
```

9- trunicate : allows you to delete all table content at once

```
trunicate table table_name;
```

10- add new column in the table

```
alter table table_name add column parentname varchar(50);
```

11- drop column from table

```
alter table drop column parentname;
```

12- drop table (allows us to delete entire table using sql)

```
drop table table_name;
```

Relationship in database

relationship are important when it comes to mysql database also known as relational database , relation are the way it descripes relation between two or more tables.

relational types are:-

1- One To One

one to one relationship describes two table that passes information to eac other and neither one of them have the redundant data.

Example

image we have two tables , one is table called studentinformation and the other is table called class.

- studentinformation table contains the following:-
  - studentid
  - studentname
  - age

```
// create table
create table studentinformation(studentid int(4) primary key,
studentname varchar(50),age int(3));

// insert data below inside the table
insert into studentinformation(studentid,studentname,age)values(
    1001,'mustafe',19);
```

studentid	studentname	age
1001	mustafe	18
1002	ahmed	19

- class table contain the following:-
  - classid
  - classname
  - studentid

  ```
  // create class table and assign the relationship
  create table class(classid int(2) primary key,
  classname varchar(50) , studentid int(4) , foreign key(studentid)
  references studentinformation(studentid));

  // insert data below to class table
  insert into class(classid,classname,studentid)values(1,'junior',
  1002);
  ```

classid	classname	studentid
1	junior	1001
2	senior	1002

- **Joint Table studentinformation and class**

  sql code below:-

  ```
  select studentniformation.studentid , studentinformation.studentname,
  studentinformation.age, class.classname from studentinformation
  inner join class on studentinformation.studentid = class.studentid;
  ```

studentid	studentname	age	classname
1001	mustafe	18	junior
1002	ahmed	19	senior

2- One To Many

one to many relationship descripes when data in one of the tables are redandent.

image we have 2 tables , table one is called customer and table two orders

- **Customer**
  - customerid
  - customername
  - customerphone

  ```
  // create customer table
  create table customer(customerid int(4) primary key ,
  customername varchar(50) , customerphone varchar(50));
  ```

```
// insert data below to the customer table
insert into customer(customerid,customername,customerphone)values(
    1001,'mustafe','06338988585');
```

customerid	customername	customerphone
2001	mustafe	06338988585
2002	mumin	06335334335

- Orders Table
  - orderid
  - productname
  - price
  - customerid

```
create table orders(orderid int(4) primary key ,
productname varchar(50) , price varchar(50), customerid int(4),
foreign key (customerid) references customer(customerid));

// insert data below to orders class
insert into orders(orderid,productname,price,customerid)values(
    101,'mobile','$100', 201);
```

orderid	productname	price	customerid
101	mobile	100	201
102	watch	50	201
103	TV	20	201

- **Join two tables : (joining two table help to organise data)**

sql code below

```
select customer.customerid,customer.customername,customer.customerphone,
orders.productname , orders.price from customer inner join orders on
customer.customerid = orders.customerid;
```

customerid	customername	customerphone	productname	price
201	mustafe	06338988585	mobile	100
201	mustafe	06338988585	watch	50
201	mustafe	06338988585	TV	20

3- Many To Many

many to many relationship is represent 3 table that share information.

image we have 3 tables , table one is students , table two is present , table three is absent, we need to create attendance database that enables us to mark attended student. if student is present the present table will contain 1(which means student attended the lecture) , if student is not present then absent class will contain 1 and if not it will contain 0.

- **Student Tabel**
  - studentid
  - studentname
  - coursename

  ```
  // create table called student
  create table student(stuedntid int(4) primary key ,
  studentname varchar(50) , coursename varchar(50));

  // insert below data into student table
  ```

  insert into student(studentid,studentname,coursename)values(

  ```
  101,'mustafe','database');
  ```

studentid	studentname	coursename
101	mustafe	database

- **Present Table**
  - id
  - presentcolumn
  - studentid

```
// create table called present table and connect to student table
create table present(id int(4) primary key , presentcolumn varchar(50),
studentid int(4) , foreign key (studentid) references student(studentid));

// insert data below to present table
insert into present(id,presentcolumn,studentid)values(
    1,'yes',101);
```

id	presentcolumn	studentid
1	yes	101

- **Absent Table**

  - id
  - absentcolumn
  - studentid

```
// create table called present table and connect to student table
create table absent(id int(4) primary key , absentcolumn varchar(50),
studentid int(4) , foreign key (studentid) references student(studentid));

// insert data below to present table
insert into absent(id,absentcolumn,studentid)values(
    1,'no',101);
```

id	absentcolumn	studentid
1	no	101

- now joint all the data inside the 3 tables and display it like below

```
// generate result below
select student.studentid, student.studentname,student.coursename,
present.presentcolumn,absent.absentcolumn from student inner join present
on student.studentid = present.presentcolumn inner join absent on
student.studentid = absent.absentcolumn;
```

studentid	studentname	coursename	present	absent
101	mustafe	database	yes	no

How to build database to Bussiness

1- Conceptual Data Model: in this step we are gathering information about the bussiness such as:-

- why bussiness needs database?
- what kind of database does the bussiness needs?
- what is the important area that database should store.

2- Representational Data Model: in this step we sketch how the database will look like , structure of the tables its called schema, we present what we designed to make change if the bussiness request it.

2- Physical Data Model : in this step we build the database using sql and we make it usable.