Database

Tahaluf Training Center 2021

Day 1

1 **About Tahaluf Academy**

2 **Introduction to Database – Problem Statement**

3 **Environment set up**

4 **MS SQL 2019 Express**

5 **Course content – Units 1 to 4**

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

مركز تدريب شركة تحالف

تم إنشاء مركز تدريب شركة تحالف الامارات للحلول التقنية في عام 2018 ليكون من ضمن الخدمات التي تقدمها الشركة بهدف تدريب وتأهيل موظفي القطاع الحكومي بشكل خاص والكوادر البشرية المواطنة من مختلف القطاعات والمجتمع المحلي بشكل عام، باستخدام أحدث المناهج والبرامج الأكاديمية والمهنية الاحترافية العالمية المرموقة.

رؤيتنا

أن نكون الخيار الأول للحصول على التدريب في المجال التقني والتحول الرقمي.

مهمتنا

تمكين الموارد البشرية في دولة الإمارات العربية المتحدة من الحصول على تدريب تقني عالي الجودة من خلال استخدام أحدث البرامج التقنية والمهنية.

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

خدمات مركز التدريب

نقدم خدمات التدريب والتأهيل باستخدام أحدث مناهج التدريب من المنظمات والشركات العالمية المختصة والمتميزة في مجال التدريب.

رخصة التدريب

مركز أبوظبي للتعليم والتدريب التقني والمهني ACTVET

مركز اختبارات معتمد

Pearson VUE

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

دورات وشهادات عالمية حصرية

BLOCKCHAIN TRAINING ALLIANCE

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

دورات وشهادات عالمية حصرية

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

دورات وشهادات عالمية

IoTBIZ™

Certified IoT PRACTITIONER™

Certified IoT SECURITY PRACTITIONER™

AIBIZ™

Certified AI PRACTITIONER™

cyberSAFE™

CYBERSEC FIRST RESPONDER®

DSBIZ™

IRBIZ™

Cyber{SECURE}Coder®

الاسم	**مركز تدريب شركة تحالف الإمارات للحلول التقنية** **ايمن طعان / م. محمد المومني**
رقم الهاتف	
رقم الجوال	00962799918282
العنوان	الاردن / اربد
البريد الاكتروني	trainingcenter@tahaluf.ae a.taan.ext@tahaluf.ae

Day 1

1. About Tahaluf Academy
2. **Introduction to Database – Problem Statement**
3. Environment set up
4. SQL Server Express 2019
5. Course content – Units 1 to 4

What is Database

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

"A database is a collection of information in an organized form that allows quicker and better storage, access and manipulation."

Why to use Database?

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

If you were asked to extract some useful information from A School system, the higher management needs to find the highest Student GPA, lowest GPA, Average GPA, how many students at the school, how many males and females in the school … etc.!

What Can SQL do?

SQL can execute queries against a database
SQL can retrieve data from a database
SQL can insert records in a database
SQL can update records in a database
SQL can delete records from a database
SQL can create new databases
SQL can create new tables in a database
SQL can create stored procedures in a database
SQL can create views in a database
SQL can set permissions on tables, procedures, and views

RDBMS

RDBMS stands for **Relational Database Management System**. RDBMS is the basis for SQL, and for all modern database systems such as MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access.

The data in RDBMS is stored in database objects called tables. A table is a collection of related data entries and it consists of columns and rows.

Database Tables

Every table is broken up into smaller entities called fields.

A record, also called a row, is each individual entry that exists in a table, A record is a horizontal entity in a table.

A column is a vertical entity in a table that contains all information associated with a specific field in a table.

Environment Set up

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

How to Get Started

Download Microsoft SQL Server 2019 Express The first thing you need to get started is a FREE copy of Microsoft® SQL Server® 2019 Express.

Navigate to https://www.microsoft.com/en-us/sql-server/sql-server-downloads

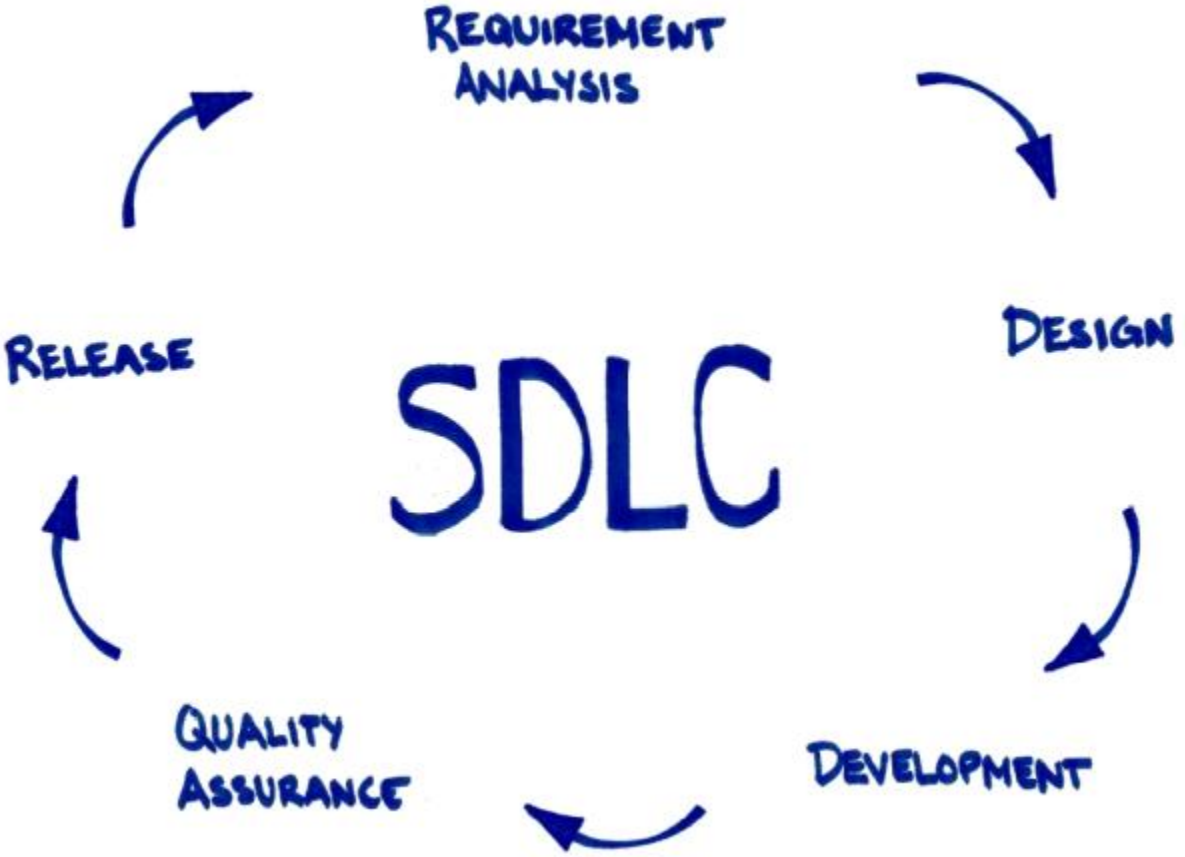
click the “Download Now” button under “Express”. Once downloaded, run the executable and follow the on-screen instructions to install Microsoft® SQL Server® 2019.

After completing that installation, navigate to https://aka.ms/ssmsfullsetup

and download one of the more recent version of SQL Server Management Studio. Download and Attach **AdventureWorks**

SDLC

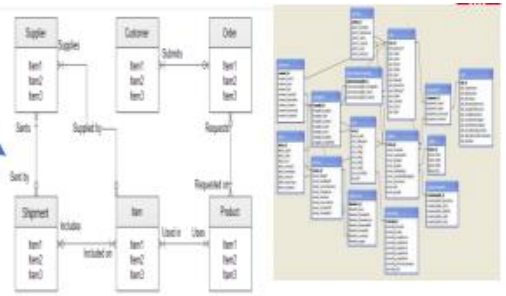
Development Life Cycle
SDLC



SDLC

System Documents

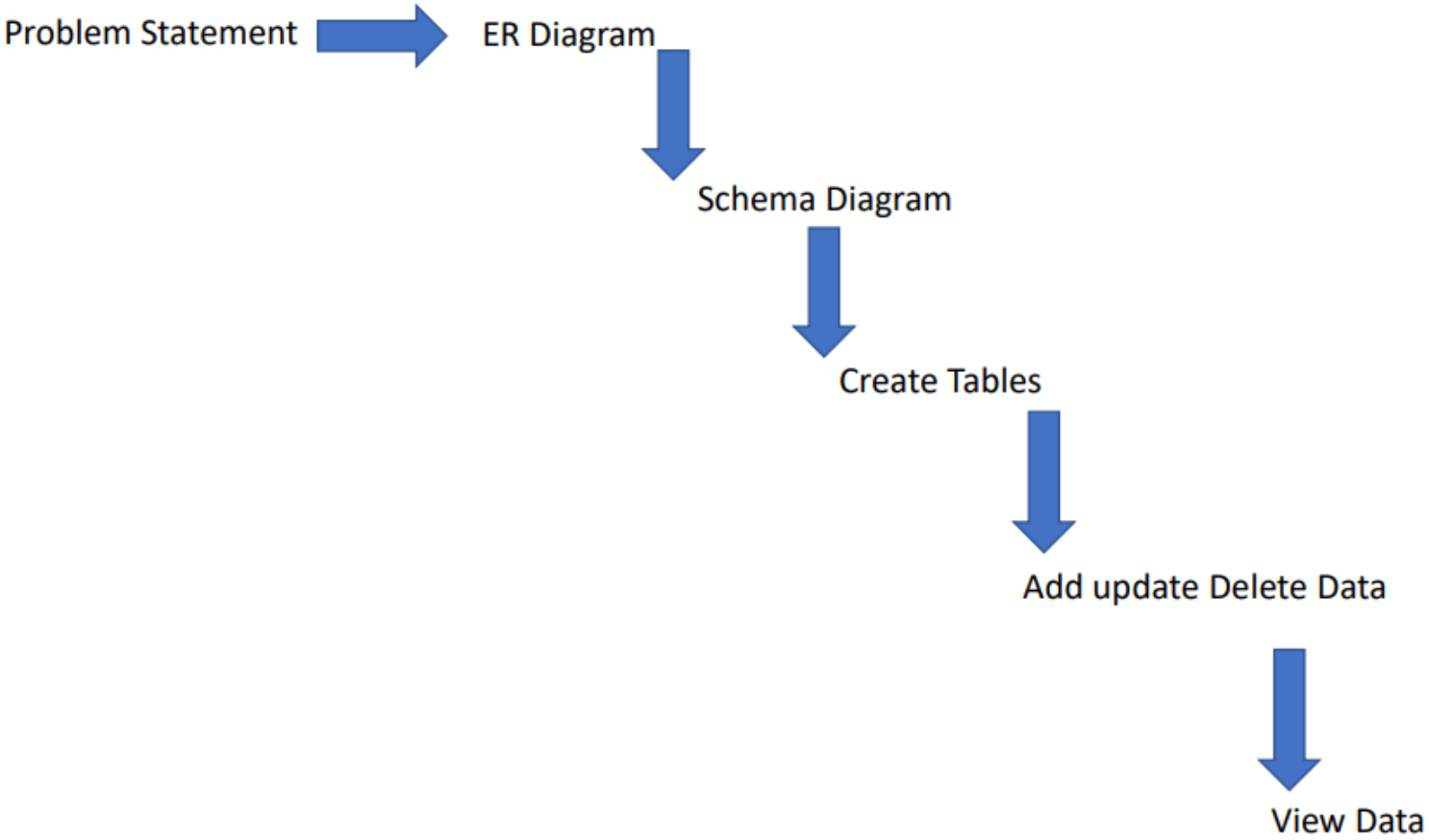
System analysis



System Design

System Testing

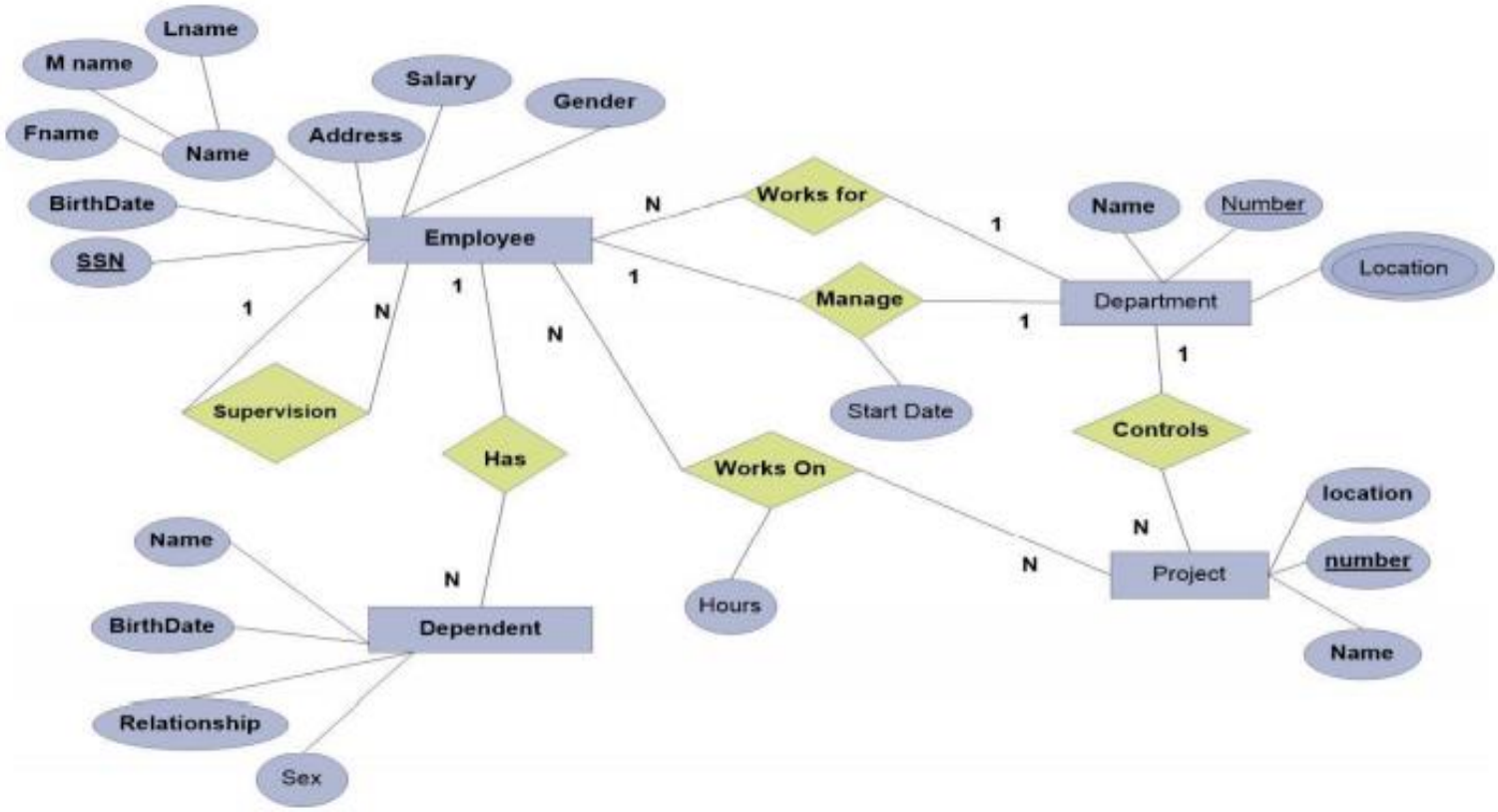
Database analysis



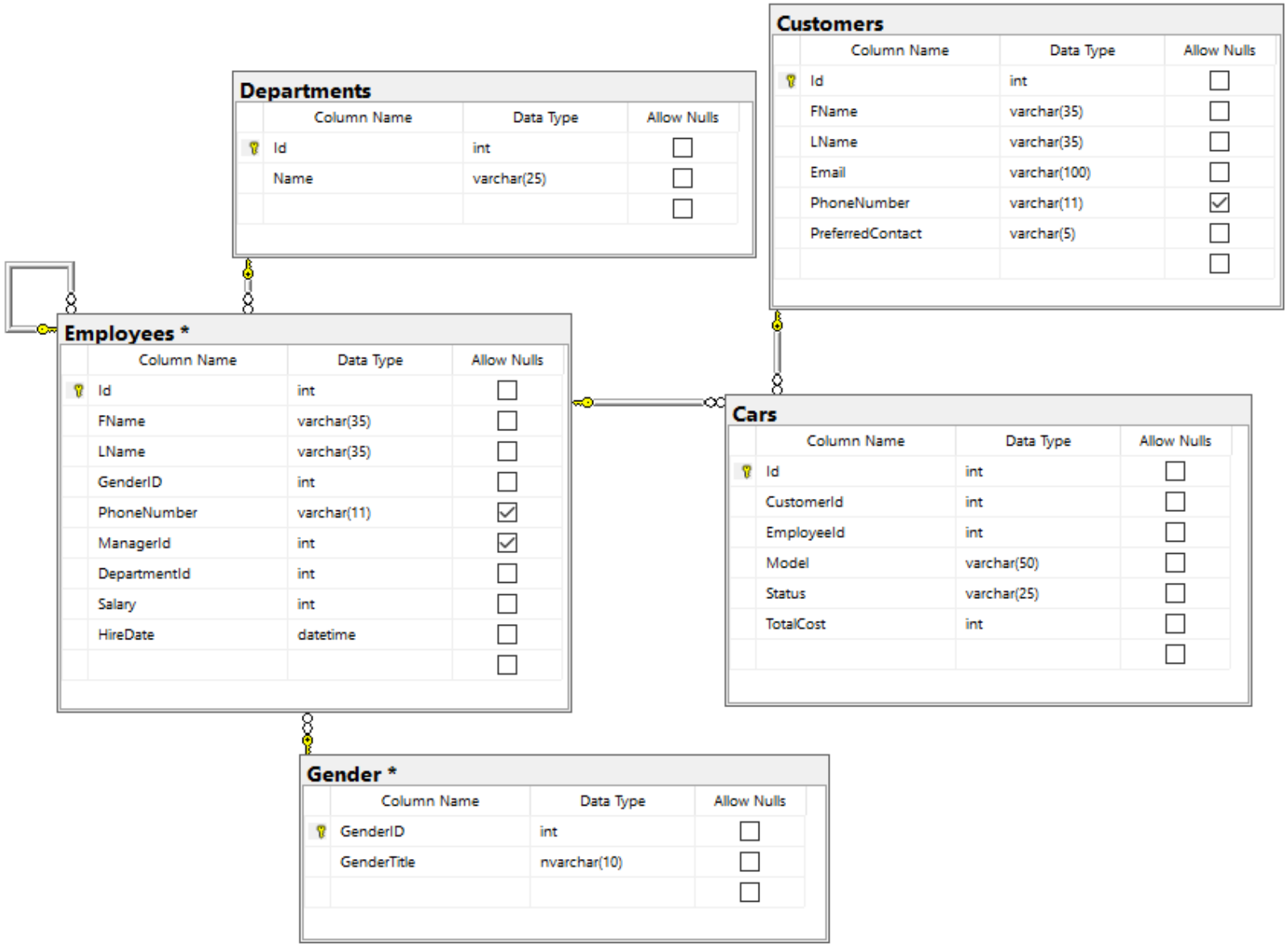
Proposed Project after finishing the course

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

Company ER Diagram



Proposed Project during the course



another database

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

tblGender

Column Name	Data Type	Allow Nulls
GenderID	int	☐
GenderTitle	nvarchar(10)	☐

GenderID	GenderTitle
1	Male
2	Female
3	N/A

tblStudent

TAH-LAP-JOR017\SQ...- dbo.tblStudent | SQLQuery5.sql - TA...P-J

Column Name	Data Type	Allow Nulls
StudentID	int	☐
StudentFirstName	nvarchar(50)	☐
StudentLastName	nvarchar(50)	☐
StudentGPA	float	☐
GenderID	int	☐

StudentID	StudentFirstNa...	StudentLastNa...	StudentGPA	GenderID
1	Jack	Nick	3.95	1
3	Sandra	Black	3.5	2
4	Leo	Decarl	2.5	1
5	John	Miller	1.75	1
6	Tia	Norm	4	2
7	Mira	Willson	3.8	2
8	Adam	Johnson	3.95	1

Entities and Simple Attributes:

Multi-Valued Attributes: are

1:1 Relationships

1:N Relationships

N:N Relationships

SQL main components

DDL or Data Definition Language actually consists of the SQL commands that can be used to define the database schema.

It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in database.

Examples of DDL commands SQL Data Definition Language DDL

CREATE DROP ALTER TRUNCATE COMMENT RENAME

SQL main components

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

DML(Data Manipulation Language) :
(CRUD: Create, Read, Update and Delete)

INSERT – is used to insert data into a table.
SELECT – is used to query data from a table(s).
UPDATE – is used to update existing data within a table.
DELETE – is used to delete records from a database table.

SQL main components

شركة تحالف الإمارات للحلول التقنية ذ.م.م.
TAHALUF AL EMARAT TECHNICAL SOLUTIONS L.L.C.

DCL(Data Control Language) :

DCL includes commands such as GRANT and REVOKE which mainly deals with the rights, permissions and other controls of the database system. Examples of DCL commands GRANT-gives user's access privileges to database. REVOKE-withdraw user's access privileges given by using the GRANT command

SQL Statements

Most of the actions you need to perform on a database are done with SQL statements.

Semicolon after SQL Statements?
Some database systems require a semicolon at the end of each SQL statement.

SQL keywords are NOT case sensitive: select is the same as SELECT

SQL Select Statements

SQL SELECT Statement:

Example:

```
SELECT CustomerName, City FROM Customers;
```

CustomerName	City
Ahmad	Amman
Sara	Irbid
Rawan	Irbid

SQL Select Statements

SQL SELECT Statement:

Example:

```
SELECT * FROM Customers;
```

CustomerID	CustomerName	City	ContactName
1	Ahmad	Amman	Ahmad
2	Sara	Irbid	Sara
3	Rawan	Irbid	Rawan
4	Adam	Amman	Maria
5	Faten	Aqaba	Fareed

SQL SELECT DISTINCT Statement:

Example:

```
SELECT DISTINCT City FROM Customers;
```

City
Amman
Irbid

SQL WHERE Clause

Example:

```
SELECT * FROM Customers
WHERE City='Irbid';
```

CustomerID	CustomerName	City	ContactName
2	Sara	Irbid	Sara
3	Rawan	Irbid	Rawan

SQL AND, OR and NOT Operators

AND Example:

```
select * from tblStudent
where StudentFirstName='Tia' and
StudentLastName='Norm'
```

OR Example:

```
select * from tblStudent
where StudentFirstName='Tia' or
StudentLastName='Nick'
```

NOT Example:

```
select * from tblStudent
where  Not GenderID=1
```

SQL ORDER BY Keyword

Example:

```
select * from tblStudent
where  Not GenderID=1 order by
StudentID
```

SQL NULL Values

Example:

```
Select * from tblStudent where
StudentLastName is null
```

StudentID	StudentFirstName	StudentLastName	StudentGPA	GenderID
1	Jack	Nick	3.95	1
3	Sandra	Black	3.5	2
4	Leo		2.5	1
5	John	Miller	1.75	1
6	Tia	Norm	4	2
7	Mira	Willson	3.8	2
8	Adam	Johnson	3.95	1
9	Rama	NULL	2.65	3
11	Michael	Giller	3.24	1

SQL Aliases

Example:

```
SELECT StudentFirstName + ' '
+StudentLastName AS StudentName
FROM tblStudent;
```

```
SELECT StudentFirstName + ' '
+StudentLastName AS "Student Name"
FROM tblStudent;
```

GROUP BY Statement

Example: find the number of customers in each city

```
SELECT   count(StudentID) as
StudentsAtCity , City
FROM tblStudent
group by City
```

```
SELECT   avg(StudentGPA) as
StudentsGPAAtCity , City
FROM tblStudent
group by City
```

HAVING Clause

Example:

```
SELECT max(StudentGPA) as aboveAvg
FROM tblStudent
group by StudentGPA
having StudentGPA > 2
```

Task for Day one
Create the following database and its tables