1. Name of Your Company

Simple Database Solution-SDS

2. Project Title

CSIS2300-Group 2-Database of Local Service Small Businesses

3. Team

- Tuyet Khang Truong (MySQL Expert)
- Kostiantyn Volkov (MS SQL Server Expert)

4. Weekly Meeting Hours

We will meet and work on the project on Tuesday 1:00pm every week

5. Project Description

This database will keep record of all small businesses, their services, the customers that receive services from these companies, the detail of CONTRACTS between customers and the businesses, reviews (comments) written for those businesses, and the employee of these businesses.

- Businesses have business ID, name, address (which has a number aparment, street, city, state, zip code and country), several phone numbers.
- Services have service ID, name, description, price.
- Customers have customer ID, name, phone number (a customer may have several phone numbers), addresses (each address has a number aparment, street, city, state, zip code and country), date of birth, age.
- Reviews (comments) for the business are composed of score (number of starts), comment, date, title, images.
- Contracts done between customers and businesses are recorded: contract ID number, date, fee/cost agreed, services provided (one contract can have many services), location that the services were provided.
- Employees have employee ID, name, several phone numbers, date of birth, date of hire, supervisors.
- Address of the customers that has a number aparment, street, city, state, zip code and country

6. Assumptions about Cardinality and Participations

Relationship	Cardinality	Participation
PROVIDES (between BUSINESS, SERVICES)	M:N (1 business has many services. Businesses can have the same service.)	Business must have at least 1 service. We cannot find a service that does not associate to the business.
SERVES (between BUSINESS, CUSTOMER)	M:N (1 business has many customers. 1 customer can buy in many businesses)	There are some businesses that does not have a customer because they have poor services. Customers must receive the service from at least one business.
WRITE (between CUSTOMER, REVIEWS)	1:M (A review is written by 1 customer. 1 customer writes many reviews)	A customer may not post the review.
WRITE FOR (between REVIEWS, BUSINESS)	1:M (A review is written for 1 business. 1 busniess has many reviews.)	There is a business that does not have a review.
WORK FOR (between EMPLOYEE, BUSINESS)	1:M (Each employee works for 1 business. A business has many employees)	Employee must work for at least 1 business. Business must have at least 1 employee
OFFER (between BUSINESS, CONTRACTS)	1:M (A business offers many contracts. A contract is held by a business.)	Businesses must have at least 1 contract.
SUPERVISION (between EMPLOYEE as subordinate, EMPLOYEE as supervisor)	1:M (1 employee has 1 supervisor. A supervisor has many employees.)	There are some employees that don't have a supervisor. Supervisor must have at least 1 employee.

INVOLVED IN (between EMPLOYEE, CONTRACTS)	1:M (1 employee has many contracts. 1 contract was responsibile by only 1 employee)	There are some employees that don't have any contracts. All contracts must have employee
HAS (between CUSTOMER, ADDRESS)	M:N (Customer has several address. Many customers can live in the same address)	Every customer need have an address. Every address must have customer.
RELATED TO (between CONTRACTS, ADDRESS)	1:M (1 address can have many contracts. 1 contract is related to 1 address)	There aree some addresses don't have contract. All contracts need have address.
CONNECT (between SERVICE, CONTRACTS)	M:N (a service can have many contracts. A contract can be related to many services)	There are some services that don't have contract. All contracts need connect to a service.

7. EER Modeling Diagram

In the following drawing canvas, EER Modeling shapes have been provided. You can copy and replicate them (Ctrl+C to copy and Ctrl+V to paste. You can also select a shape, then press Ctrl button and drag and drop to copy a shape) and edit them to build your diagram.

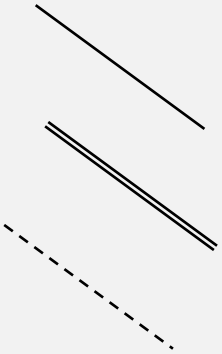

Entity can be edited

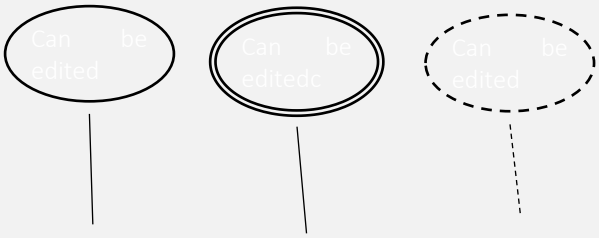

Text can be edited

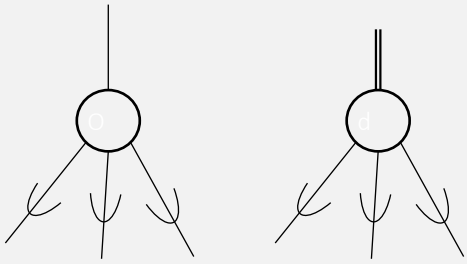
M N 1

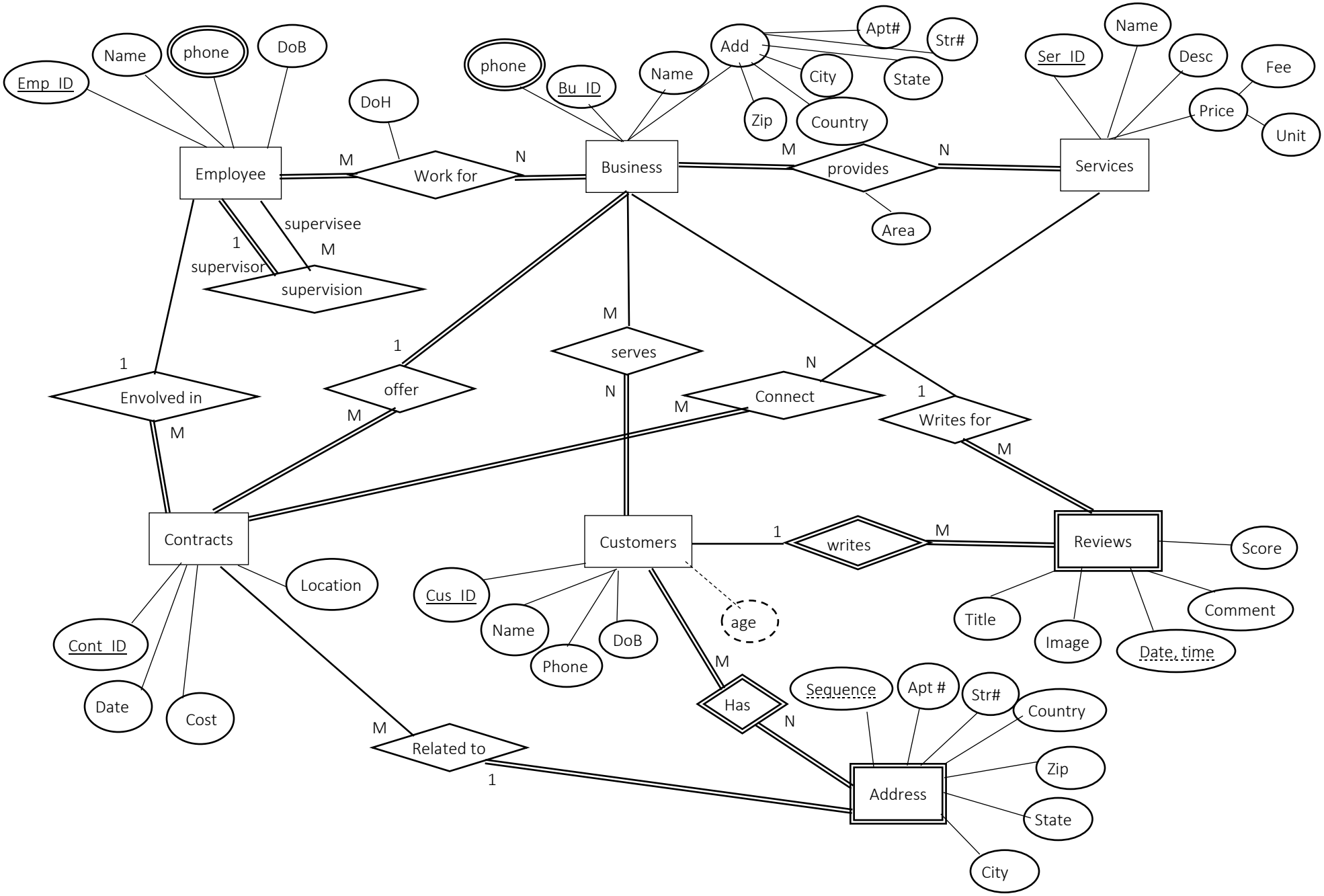

Entity can be edited


Text can be edited




Can be edited
Can be editedc
Can be edited


O
d


Emp_ID
Name
phone
DoB
Employee
DoH
Work for
M
N
phone
Bu_ID
Name
Add
Apt#
Str#
City
State
Zip
Country
Business
M
provides
N
Area
Ser_ID
Name
Desc
Fee
Price
Unit
Services
supervisee
M
1
supervisor
supervision
1
Envolved in
M
offer
M
1
serves
M
N
Connect
N
M
1
Writes for
M
Contracts
Location
Cont_ID
Date
Cost
Customers
Cus_ID
Name
Phone
DoB
age
1
writes
M
Reviews
Score
Title
Image
Date, time
Comment
M
Has
N
Sequence
Apt #
Str#
Country
Zip
State
City
Address
M
Related to
1

8. ER-Model Mapping to Database Relational Schema

Employee (Emp_ID, Name, DoB, **Supervisor_Emp_ID**)
Business (Bu_ID, Name, Apt#, Str#, City, State, Country, Zip)
Services (Ser_ID, Name, Desc, Fee, Unit)
Contracts (Cont_ID, Date, Cost, Location, **Emp_ID**, **Bu_ID**, (**Cus_ID**, **Sequence**))
Customers (Cus_ID, Name, Phone, DoB)
Customers_Reviews ((**Cus_ID**, Date&time), Image, Title, Comment, Score, **Bu_ID**)
Customers_Address ((**Cus_ID**, Sequence), Apt#, Str#, City, State, Country, Zip)
Employee_Work for_Business (**Emp_ID, Bu_ID**, DoH)
Business_Provides_Services (**Bu_ID**, **Ser_ID**, Area)
Business_Serves_Customers (**Bu_ID, Cus_ID**)
Services_Connect_Contracts (**Ser_ID, Cont_ID**)
Employee_Phone (**Emp_ID**, Phone)
Business_Phone (**Bu_ID**, Phone)

9. Normalization

- We belive that every relation in our database is normalized into 1NF, 2NF and 3NF because we have uniquely identified all entities and attributes depends on the key. Database does not contain any composite, multivalued and nested attributes, the relations in database does not have composite keys and non-prime attributes.

Employee

Emp_ID	Name	DoB	Supervisor_Emp_ID

Business

Bu_ID	Name	Apt#	Str#	City	State	Country	Zip

Services

Ser_ID	Name	Desc	Fee	Unit

Contracts

Cont_ID	Date	Cost	Location	Emp_ID	Bu_ID	Cu_ID	Sequence

Customers

Cus_ID	Name	Phone	DoB

Customers_Reviews

Cus_ID	Date&time	Image	Title	Comment	Score	Bu_ID

Customers_Address

Cus_ID	Sequence	Apt#	Str#	Zip	City	State	Country

Employee_Work for_Business

Emp_ID	Bu_ID	DoH

Business_Provides_Services

Bu_ID	Ser_ID	Area

Business_Serves_Customers

Bu_ID	Cus_ID

Services_Connect_Contracts

Ser_ID	Cont_ID

Employee_Phone

Emp_ID	Phone

Business_Phone

Bu_ID	Phone

10.Determining Data Types (Domain) and Constraints

You explain why you choose a certain data type for a field and why you apply certain constraints

- The **ID** will be a combination between letter and numbers -> text
- **Phone** is a char, not int because the maximum size of int is 2,147,483,647 while the maximum phone number is 9,999,999,999
- **Date_Time** is varchar(20) because it is a combination between date and time -> text
- All the texts will be **char**. If the length of text is bigger or equal 20, choosing **Varchar** data type to save memory
- All numbers are **int**
- All date fields are **date**
- **Numeric (5, 2)** for Fee_Ser, Cost_Con because it is a currency
- **NOT NULL** for Name_Emp, Name_Bu, Name_Ser, Fee_Ser, Unit_Ser, Cost_Con, Name_Cus, Title, Comments. It means that all this attributes must be entered
- **ON DELETE SET NULL** for foreign key (Supervisor_Emp_ID) references Employee(Emp_ID), so that when we delete supervisor, Supervisor_Emp_ID on the row of supervisee will be null not be deleted.
- **ON DELETE CASCADE**: when we deleted data on parent table, the relative data on child table will be deleted
- **PRIMARY KEY** and **FOREIGN KEY** used often to tie the tables together
- **CHECK** for fees and cost to make sure they are more than 0, for reviews to fall from 1 to 5.
- **UNIQUE** for customer phone number because there should be no 2 two csutomers with same phone numbers

11.Creating Database and Tables - SQL DDL

You do not need to copy SQL commands here. Save your SQL commands in a script file and just mention the name of the file here. Make sure the script file is stored besides this document within the same folder.

The name of script files: create.sql

12.Inserting Values in Tables

You do not need to copy SQL commands here. Save your SQL commands in a script file and just mention the name of the file here. Make sure the script file is stored beside this document within the same folder.

The name of script files: insert.sql

13.SQL Queries

You do not need to copy SQL commands here. Save your SQL commands in a script file and just mention the name of the file here. Make sure the script file is stored beside this document within the same folder.

The name of file: choosing 20 queries.txt

14.Views

You do not need to copy SQL commands here. Save your SQL commands in a script file and just mention the name of the file here. Make sure the script file is stored beside this document within the same folder.