CSI 2132 Lab#2

- Basic SQL Programming

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Updates / Comments

- Lab attendance is mandatory starting this week
- If we don't finish the lab during the lab time, you need to complete it on your own time – labs might build on each other.

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Outline

- **Review syntax of:**
  - Creating a new Schema
  - CREATE TABLE
  - INSERT
  - SELECT
  - UPDATE
  - DELETE

- **Exercises to cover:**
  - Create a new schema and set it as default
  - Creating tables from ER Diagrams
  - Inserting data to tables
  - Querying the database
  - Updating specific data
  - Deleting specific data

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Create a new Schema and set it to default

- Right click on **Schemas** in tree control > click on **Create** > click on **Schema**

- In the **Create-Schema** window, in **General** tab name the new schema "laboratories" and owner "your username".

- In order to use this newly created schema as the default one for the queries instead of the "public" schema, execute this statement using the Query Tool:
  - `SET search_path = laboratories;`

  Note that this will be applied for the current session ONLY.

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ER Diagram

- Tables Artist, Artwork, Customer, LikeArtist (many to many relationship)
- Remember the primary key and foreign key constraints.
- A good convention is declaring the primary key(s) as the first attribute in the tables.

Some Useful Data Types:
- `VARCHAR(n)`
- `DATE`
- `NUMERIC(n,m)`
- `INTEGER`
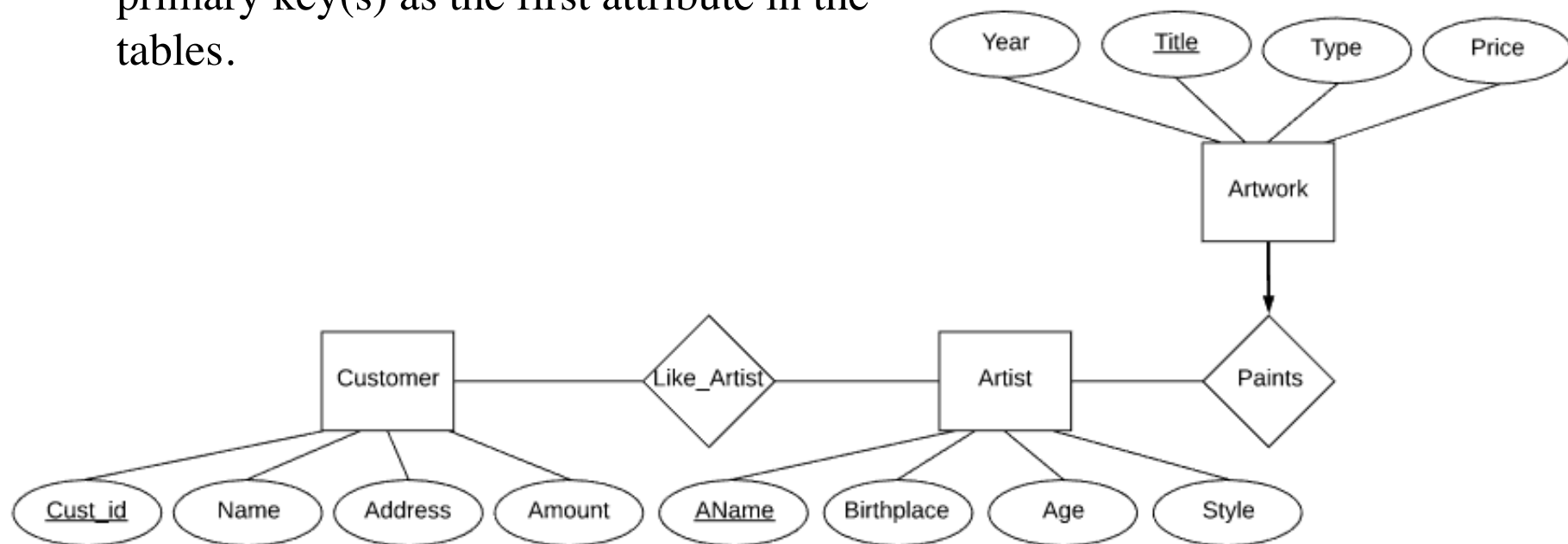
SQL CREATE TABLE Statement

- Syntax

```
CREATE TABLE TableName
(
    column1 datatype1,
    column2 datatype2,
    ...
    columnN datatypeN,
    constraint1, constraint2, ... , constraintM
);
```

- Example

```
CREATE TABLE Artist
(
    AName VARCHAR(20),
    Birthplace VARCHAR(20),
    Style VARCHAR(20),
    DateOfBirth INTEGER,
    PRIMARY KEY (AName)
);
```

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Tables to be Created

Artist

AName	varchar(20)	primary key
Birthplace	varchar(20)	
Style	varchar(20)	
DateOfBirth	date	

Customer

Cust_id	integer	primary key
Name	varchar(20)	
Address	varchar(20)	
Amount	numeric(8,2)	

Artwork

Title	varchar(20)	primary key
Year	integer	
Type	varchar(20)	
Price	numeric(8,2)	
AName	varchar(20)	foreign key

Like_Artist

Cust_id	integer	foreign key
AName	varchar(20)	foreign key
(Cust_id, AName)		primary key

The Code for all the Tables

```
CREATE TABLE Artist
(
    AName VARCHAR(20),
    Birthplace VARCHAR(20),
    Style VARCHAR(20),
    DateOfBirth DATE,
    PRIMARY KEY (AName)
);


CREATE TABLE Artwork
(
    Title VARCHAR(20),
    Year INTEGER,
    Type VARCHAR(20),
    AName VARCHAR(20),
    Price NUMERIC(8,2),
    PRIMARY KEY (Title),
    FOREIGN KEY (AName) REFERENCES Artist
);
```

```
CREATE TABLE Customer
(
    Cust_id INTEGER,
    Name VARCHAR(20),
    Address VARCHAR(20),
    Amount NUMERIC(8,2),
    PRIMARY KEY (Cust_id)
);


CREATE TABLE LikeArtist
(
    Cust_id INTEGER,
    AName VARCHAR(20),
    PRIMARY KEY(AName, Cust_id),
    FOREIGN KEY (AName) REFERENCES Artist,
    FOREIGN KEY (Cust_id) REFERENCES Customer
);
```

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SQL INSERT INTO Statment

- Syntax

  `INSERT INTO TableName(column1, ... ,columnN) VALUES (value1, ... ,valueN);`

- Example

  `INSERT INTO Artist(AName, Birthplace, Style, DateOfBirth) VALUES ('Caravaggio', 'Milan', 'Baroque', '1571-09-28');`

- Character values are quoted by `' '`, and numerical values are unquoted when inserting.

- Several inserts can be done consecutively in the Query Tool.

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Values to be Inserted

- Customer(Cust_id, Name, Address, Amount) Table
  - (1, 'John', 'Ottawa', 8.5)
  - (2, 'Amy', 'Orleans', 9.0)
  - (3, 'Peter', 'Gatineau', 6.3)
- Artist(AName, Birthplace, Style, DateOfBirth)
  - ('Caravaggio', 'Milan', 'Baroque', '1571-09-28')
  - ('Smith', 'Ottawa', 'Modern', '1977-12-12')
  - ('Picasso', 'Malaga', 'Cubism', '1881-10-25')
- Artwork(Title, Year, Type, Price, AName)
  - ('Blue', 2000, 'Modern', 10000.00, 'Smith')
  - ('The Cardsharps', 1594, 'Baroque', 40000.00, 'Caravaggio')

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SQL SELECT STATEMENT

- Syntax

```
SELECT column1, column2, ... ,columnN
FROM table_name;
WHERE condition;
```

- Example

```
SELECT Style
FROM Artist
WHERE AName='Smith';
```

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Exercise: Create the following Queries

- List all artists that are born in Ottawa
- List the titles and prices of all artworks painted in 2000.

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SQL UPDATE Statement

- We can also modify certain data satisfying a condition from a table with UPDATE command. Condition is the same as WHERE clause of SELECT query. If you omit the WHERE clause, **all records will be updated permanently**.

- Syntax

  ```
  UPDATE table_name
  SET column1 = value1, column2 = value2, ... , columnN = valueN
  WHERE condition;
  ```

- Example

  ```
  UPDATE Customer
  SET Name ='Bruce'
  WHERE Cust_id = 1;
  ```

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Exercise: Update the Following Data

- Update Customer Name John to Bruce.
- Update the Amount value for all the Customers in the Database to be 9.8 and the address to be Gatineau.

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SQL DELETE STATEMENT

- We can delete certain rows satisfying a condition from a table with DELETE command. Condition is the same as WHERE clause of SELECT query. If you omit the WHERE clause, **all records will be deleted permanently**.

- Syntax

```
DELETE FROM table_name
WHERE condition;
```

- Example

```
DELETE FROM Customer
WHERE Cust_id=1;
```

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Exercise: Delete the Following Rows

- Remove Customer Amy from our Database.

- Remove all the remaining Customers from the database.

- Suppose the artist 'Smith' moved to another gallery, and we have to remove him from our database. (Note that Artwork table has a foreign key to Artist table)

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For Detailed Information

- About SQL Syntax
  - http://www.faqs.org/docs/ppbook/c22759.htm

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