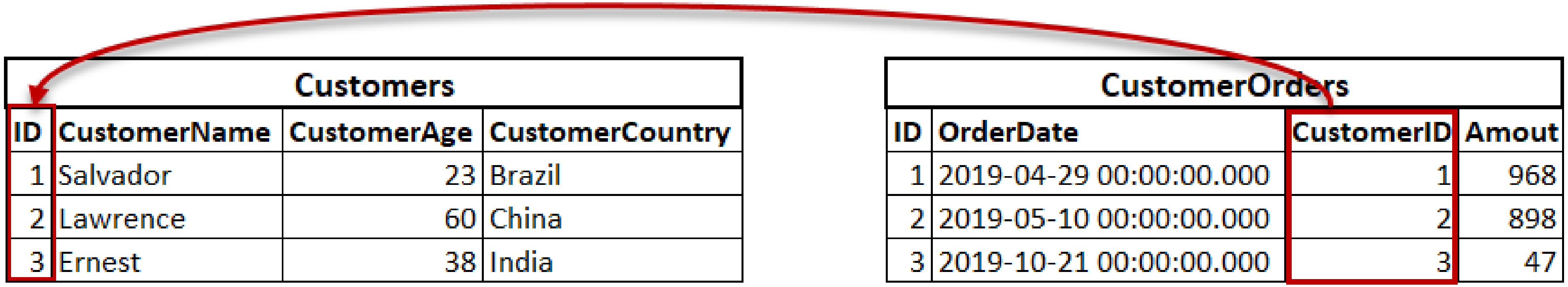
4TH COFFEE

Intro to SQL

Final Week

Foreign Keys

- Reminder: Foreign Keys are when one table references another



Customers

ID	CustomerName	CustomerAge	CustomerCountry
1	Salvador	23	Brazil
2	Lawrence	60	China
3	Ernest	38	India

CustomerOrders

ID	OrderDate	CustomerID	Amout
1	2019-04-29 00:00:00.000	1	968
2	2019-05-10 00:00:00.000	2	898
3	2019-10-21 00:00:00.000	3	47

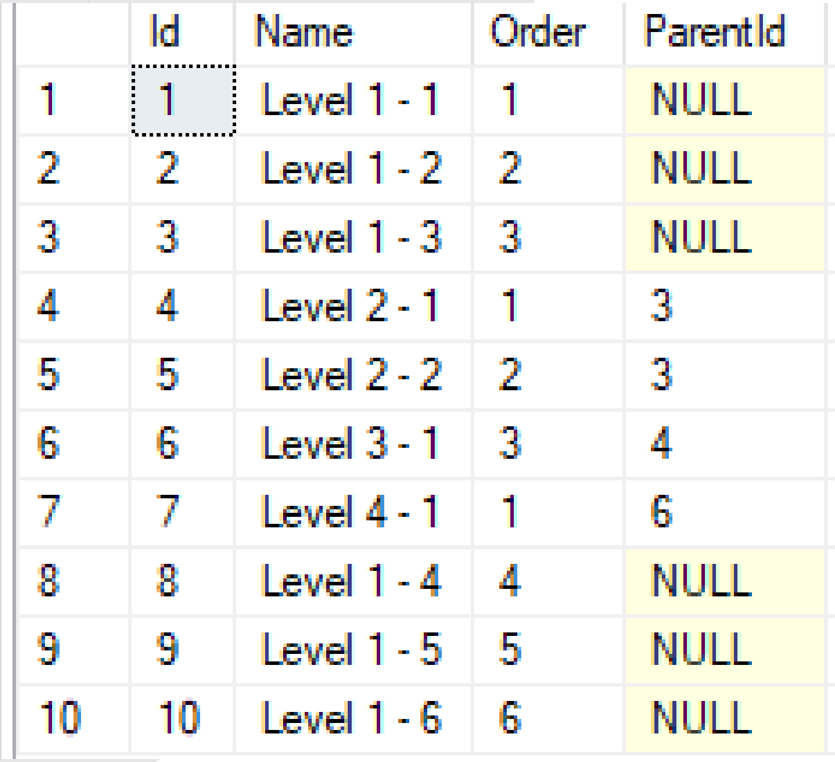
Parent Ids

- Parent Ids are self-referential

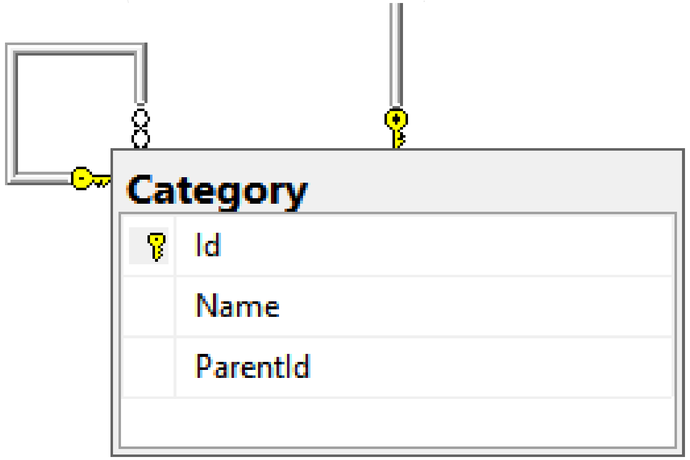
When a table has a foreign key back to itself

Ex: When publishing books with multiple sequels, the

'child' entries will set the parent_id as the main book first published



	Id	Name	Order	ParentId
1	1	Level 1 - 1	1	NULL
2	2	Level 1 - 2	2	NULL
3	3	Level 1 - 3	3	NULL
4	4	Level 2 - 1	1	3
5	5	Level 2 - 2	2	3
6	6	Level 3 - 1	3	4
7	7	Level 4 - 1	1	6
8	8	Level 1 - 4	4	NULL
9	9	Level 1 - 5	5	NULL
10	10	Level 1 - 6	6	NULL



More SQL functions\Clauses

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SQL Function: Sum, Aliases & Pseudo Cols

```
Select
product.name,
sum(product.amount) as sumamt,
count(product.amount) as totalproducts,
FROM
product left join type
group by type.name
order by type.name
```

https://www.sqlshack.com

AVG

```
Select avg(orders.amount) from orders
```

Distinct

```
Select distinct names from product;
```

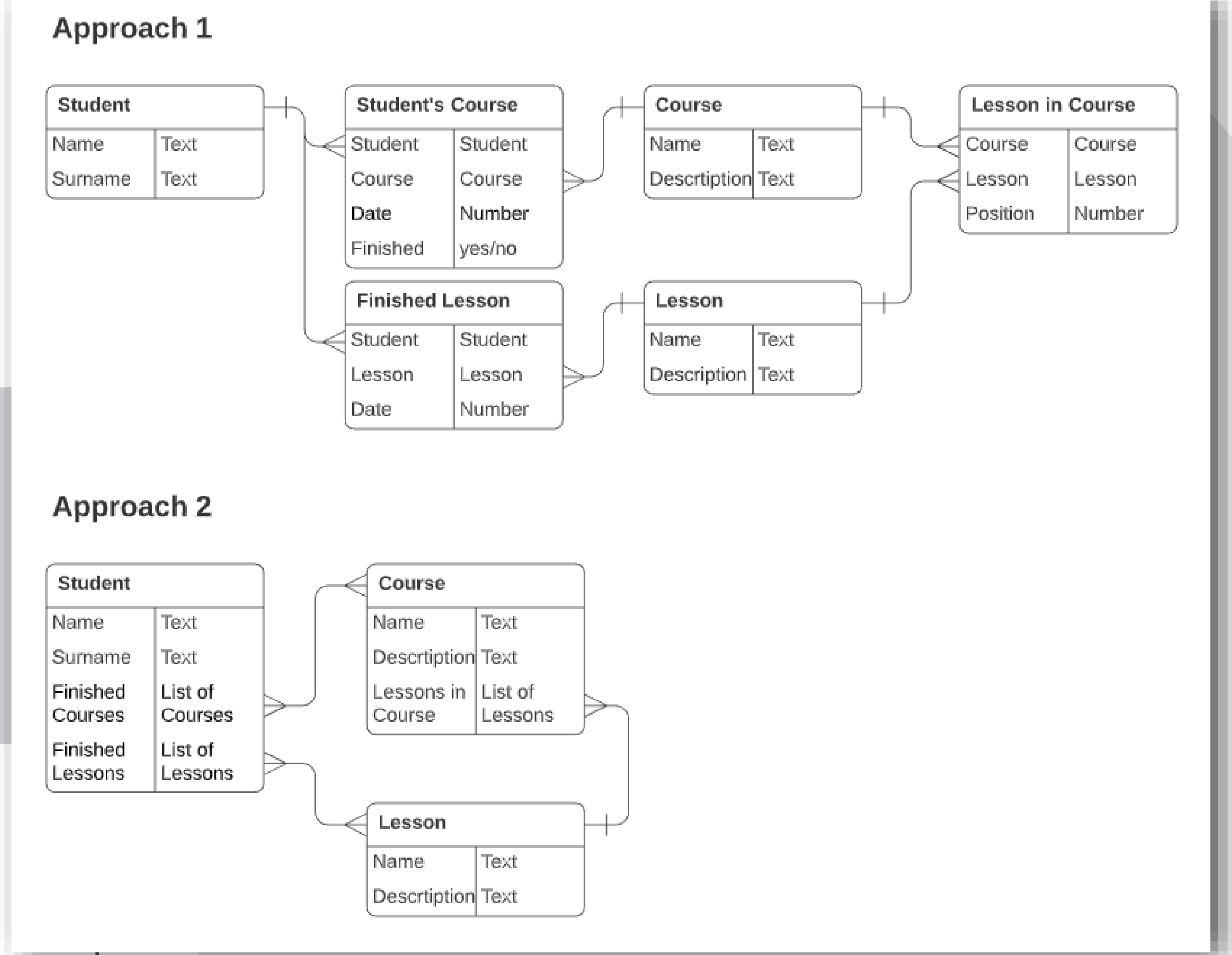
LIMIT

```
Select  names from product LIMT 5;
```

SQL FUNCTION: UPPER & DOING MATH

```
CREATE VIEW vw_invoice as
   select  products.id,
  upper(products.name),
   type.name,
  orders.productamount,
  users.username ,
   orders.productamount * products.cost as totalcost
  FROM
   products
    join type on products.typeid=type.id
   join orders   on products.id = orders.productid
    join  users   on   orders.userid = users.userid
```

1. Identify the db you want to build



Approach 1

Student	
Name	Text
Surname	Text

Student's Course	
Student	Student
Course	Course
Date	Number
Finished	yes/no

Course	
Name	Text
Descrtiption	Text

Lesson in Course	
Course	Course
Lesson	Lesson
Position	Number

Finished Lesson	
Student	Student
Lesson	Lesson
Date	Number

Lesson	
Name	Text
Description	Text

Approach 2

Student	
Name	Text
Surname	Text
Finished Courses	List of Courses
Finished Lessons	List of Lessons

Course	
Name	Text
Descrtiption	Text
Lessons in Course	List of Lessons

Lesson	
Name	Text
Descrtiption	Text

This database should have at least three-four tables. This database should contain at least a main table and a type table.

Focus on your hobby or profession and create a database to track that information

- Do you like sports? Build a database to track NBA team members, their teams and locations
- Do you like watching TV? Recreate IMDB or Netflix
- Like shopping? building an ecommerce site like Coach USA, Amazon or Walmart (with fields of productname, producttype, productcost)

Once you've identified the type of database to create

1. Identify the name of the database, the names of the tables, the fields and their types.
2. Make certain each table has a primary key
3. Write this down or enter into word, excel or lucidcharts

REMINDER: YOU CANNOT USE SPACES OR SPECIAL CHARACTERS (slashes, asterisks) in the name of any database object

2. Build your db tables!

1. Open Sql Lite
2. Click create new db - enter the name of your database

   i.e. ecommerce.db or sports.db
3. Now create your tables either with SQL or the UI

Sample DB Structure

```
create table  TABLENAME
(
  COLUMNNAME integer   NOT NULL PRIMARY KEY,
   COLUMNNAME  DATATYPE
 );
```

Sample Code

```
 create table product (
 id integer   NOT NULL PRIMARY KEY,
 name  varchar(255),
 description varchar(255),
 cost     double,
 typeid  integer
 );
```

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#3. INSERT DATA

Insert 4 rows of sample data into your database

Structure:

INSERT INTO TABLENAME (col1, col2) values

(value1, value2, ...)

Example:

INSERT INTO DOGS (id, name) values (1, 'spot');

#4. BUILD SQL

Run a couple sample queries.
Select * from YOURTABLENAME;

Select data alphabetically
SELECT column1, column2 FROM YOURTABLE ORDER BY column1;

Do a pattern match search on the title field

- SELECT column1, column2, colum3 FROM YOURTABLE WHERE column1 LIKE '%YOURSEARCHWORD% ';

#5. CREATE VIEWS

- identify and create at least 2 views that you or an end user would use frequently
- one view should join your main and type tables together

Structure:

```
CREATE VIEW [viewname] as
[Standard SQL i.e. select * from dogs]
```

Example:

```
        CREATE VIEW vw_invoice as
          select
                 products.name,
                 type.name,
                 orders.productamount
          FROM
          products
                 join type on products.typeid=type.id
          join orders   on products.id = orders.productid
```

#6. CREATE INDEXES ON EACH TABLE

- Identify the fields that you feel you or an end user might use most frequently on each table
- Create an index for each table

Structure:

```
Create index [index_name]  ON
[table name] [col names]
```

Example:

```
CREATE INDEX  idx_products  ON  products  (
              id , name
)
```

7. Bonus: Create a history table & trigger to insert into it

```
CREATE TABLE history  (
historyid INTEGER PRIMARY KEY AUTOINCREMENT,
id INTEGER,
colname TEXT,
datechanged TEXT);

CREATE TRIGGER t_history
  After INSERT ON tablename
  BEGIN
    insert into history  (cols) values (NEW.id, NEW.cols, date('now'));
   END
```

Try Some Advanced SQL

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SQL Function: Sum, Aliases & Pseudo Cols

```
Select
column as alias,
sum(column) as pseudocol,
count(column) as
totalproducts,
FROM
table1
order by column
```

https://www.sqlshack.com

Distinct

```
Select distinct colname from
tablename;
```

LIMIT

```
Select  COLnames from
tablename LIMIT 5;
```

SQL FUNCTION: UPPER & DOING MATH

```
SELECT
   upper(colname),
    id  * 5 as fakeid
   FROM
     tablename
```

Next Steps

Guided

- Varsity Tutors, Independent Tutor
- Lynda.com (typically included in library, university or linkedin memberships)
- CodeCademy (offers free classes)

Online Resources

- w3schools.com
- https://www.tutorialspoint.com/sql/index.htm
- https://www.geeksforgeeks.org/sql-tutorial/
- https://www.sqltutorial.org/
- https://www.guru99.com/sql.html

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THANK YOU