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Deliverable 3

Accessing Our Application: We placed our web application and database on the NJIT servers so that it could be accessed through the internet. To access our Deliverable 3 application go the following link: <https://web.njit.edu/~mdm56/cs331/deliverable3/index.html>

Goals:

The Project's Goal: The goal of this part of the project was to create a MySQL database and a query application that would use SQL code to request the information from the database we created. By doing this we'd gain a better understanding of the full cycle of designing and building a database.

The Group's Goal: Our group wanted to take the deliverable three a step further and use our web development skills to build out an entire interface by hand that would utilize these queries and a connection to the database to allow user interaction the requirements described.

Challenges:

There were a few challenges our group faced during the creation of our application.

1. Creating the database took a few attempts because we realized the order you create foreign keys and tables is important. Once we realized the reality of that we made a plan of the order we'd create tables.
2. Filling the database manually was pretty tedious and took a while because we needed to create instances of the queries you requested. For example there needed to be photographers that only took portrait pictures.
3. There were queries that were worded ambiguous, one of the worst being number 7. It could be interpreted two ways. (List models who modeled in all photos taken by photographer Y)
 - a. You could read this is all the photos the models were in were taken by the photographer.
 - b. Or you could read it as all photos the photographer took the models were in

These are different because we wondered if a model could be in other photographer's pictures or can the photographer take pictures of other models.

4. Filling fake information was tedious but became easier when we discovered random names, address, and birthday generators.
5. Working together was a challenge since it all needed to take place online. But through the use of GitHub and online voice chats we were able to overcome any problems with cooperation.

Revisions To Deliverable 2:

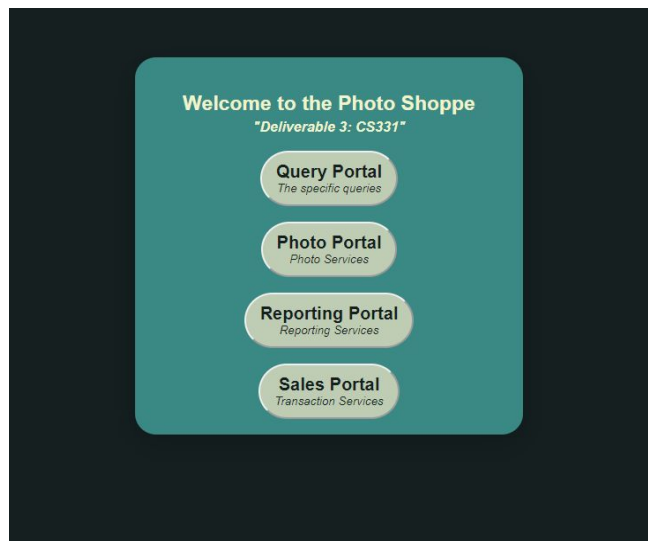
We used the solution to deliverable 2 given to the class with some minor changes. To allow for easier query creation, we added attributes to eliminate the need for multivalued Foreign Keys and Primary Keys.

1. In the MODEL table we made a multi-attribute constraint that make MName MDate unique and then added a new primary key MID so that attribute could be referenced with a foreign key in MODELS.
2. We did something identical to Photographer adding a new primary key PID and making a multi-attribute constraint that requires PName and PDate to be unique.
3. Lastly we did the identical adjustment to LOCATION, by adding the primary key LOCID that would be referenced in Landscape rather than LocationPlace and LocationCountry.

The Project:

Description/Execution: We decided we would build our web application with PHP, HTML, and a little CSS and JavaScript while utilizing NJIT's phpMyAdmin to build the MySQL database.

We created a plan to make a four part interface:



Query Portal: A webpage that could execute the 14 specific queries and show entire tables.

Photo Portal: A webpage that allowed adding a new photo, deleting an existing photo, changing photo information, and querying photo information

Reporting Portal: A web page that could generate sales reports including some found in the query portal and some that we would think of on our own.

Sales Portal: A webpage that could process a sale, view a sale (given transactionID), and find sales (given different features e.g. date, customer name etc.).

Each web page would allow for the user to interact with the inputs to the queries we were required to write for the deliverable

SQL Tables:

Abstract:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Abstract` (`PhotoID` int(11) NOT NULL, `Comment` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Abstract` ADD PRIMARY KEY (`PhotoID`); ALTER TABLE `Abstract` ADD CONSTRAINT `Abstract_ibfk_1` FOREIGN KEY (`PhotoID`) REFERENCES `Photo` (`PhotoID`) ON DELETE CASCADE ON UPDATE CASCADE;</pre>
Populate Table	<pre>INSERT INTO `Abstract` (`PhotoID`, `Comment`) VALUES (3, 'An orange.'), [...], (23, 'A cup of coffee.');</pre>

Customer:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Customer` (`LoginName` varchar(255) NOT NULL, `Password` varchar(255) NOT NULL, `CName` varchar(255) NOT NULL, `CType` varchar(255) NOT NULL, `BillingAddress` varchar(255) NOT NULL, `Str1` varchar(255) NOT NULL, `Str2` varchar(255) NOT NULL, `City` varchar(255) NOT NULL, `State` varchar(2) NOT NULL, `Zip` varchar(5) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Customer` ADD PRIMARY KEY (`LoginName`);</pre>
Populate Table	<pre>INSERT INTO `Customer` (`LoginName`, `Password`, `CName`, `CType`, `BillingAddress`, `Str1`, `Str2`, `City`, `State`, `Zip`) VALUES ('aswift31', 'as121', 'Alysha Swift', 'individual', '29 Carpenter St.\r\nSumter, SC 29150', '29 Carpenter St.', '', 'Sumter', 'SC', '29150'), [...], ('bhunt23', 'bh816', 'Boyd Hunt', 'individual', '60 Sierra St.\r\nMuskogee, OK 74403', '60 Sierra St.', '', 'Muskogee', 'OK', '74403');</pre>

Influences:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Influences` (`EPID` int(11) NOT NULL, `RPID` int(11) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Influences` ADD PRIMARY KEY (`EPID`,`RPID`), ADD KEY `Influences_ibfk_2` (`RPID`); ALTER TABLE `Influences` ADD CONSTRAINT `Influences_ibfk_1` FOREIGN KEY (`EPID`) REFERENCES `Photographer` (`PID`) ON DELETE CASCADE ON UPDATE CASCADE, ADD CONSTRAINT `Influences_ibfk_2` FOREIGN KEY (`RPID`) REFERENCES `Photographer` (`PID`) ON DELETE CASCADE ON UPDATE CASCADE;</pre>
Populate Table	<pre>INSERT INTO `Influences` (`EPID`, `RPID`) VALUES (6, 1), [...], (3, 2);</pre>

Landscape:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Landscape` (`PhotoID` int(11) NOT NULL, `LOCID` int(11) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Landscape` ADD PRIMARY KEY (`PhotoID`), ADD KEY `LOCID` (`LOCID`); ALTER TABLE `Landscape` ADD CONSTRAINT `Landscape_ibfk_1` FOREIGN KEY (`PhotoID`) REFERENCES `Photo` (`PhotoID`) ON DELETE CASCADE ON UPDATE CASCADE, ADD CONSTRAINT `Landscape_ibfk_2` FOREIGN KEY (`LOCID`) REFERENCES `Location` (`LOCID`) ON DELETE CASCADE ON UPDATE CASCADE;</pre>
Populate Table	<pre>INSERT INTO `Landscape` (`PhotoID`, `LOCID`) VALUES (2, 1), [...], (16, 1);</pre>

Location:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Location` (`LOCID` int(11) NOT NULL, `Place` varchar(255) NOT NULL, `Country` varchar(255) NOT NULL, `Description` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Location` ADD PRIMARY KEY (`LOCID`), ADD UNIQUE KEY `Place_2` (`Place`,`Country`);</pre>
Populate Table	<pre>INSERT INTO `Location` (`LOCID`, `Place`, `Country`, `Description`) VALUES (1, 'Chicago', 'United States', 'The Windy City'),</pre>

	<pre>[...], (2, 'New York City', 'United States', 'Big apple');</pre>
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Model:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Model` (`MID` int(11) NOT NULL, `MName` varchar(255) NOT NULL, `MBDate` date NOT NULL, `MBio` varchar(255) NOT NULL, `MSex` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Model` ADD PRIMARY KEY (`MID`), ADD UNIQUE KEY `MName_2` (`MName`,`MBDate`);</pre>
Populate Table	<pre>INSERT INTO `Model` (`MID`, `MName`, `MBDate`, `MBio`, `MSex`) VALUES (1, 'Safiyyah Rigby', '1997-07-29', 'Specializes in solo portraits.', 'Female'), [...], (2, 'Rafferty Garrison', '1992-05-29', '', 'Male');</pre>

Models:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Models` (`PhotoID` int(11) NOT NULL, `MID` int(11) NOT NULL, `Agency` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Models` ADD PRIMARY KEY (`PhotoID`,`MID`), ADD KEY `Models_ibfk_2` (`MID`); ALTER TABLE `Models` ADD CONSTRAINT `Models_ibfk_1` FOREIGN KEY (`PhotoID`) REFERENCES `Portrait` (`PhotoID`) ON DELETE CASCADE ON UPDATE CASCADE, ADD CONSTRAINT `Models_ibfk_2` FOREIGN KEY (`MID`) REFERENCES `Model` (`MID`) ON DELETE CASCADE ON UPDATE CASCADE;</pre>
Populate Table	<pre>INSERT INTO `Models` (`PhotoID`, `MID`, `Agency`) VALUES (1, 1, 'Model's For Cheap'), [...], (1, 10, 'Model's For Cheap');</pre>

Photo:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Photo` (`PhotoID` int(11) NOT NULL, `Speed` decimal(10,2) NOT NULL, `Film` varchar(255) NOT NULL, `F-Stop` decimal(10,2) NOT NULL, `Color/B&W` varchar(255) NOT NULL, `Resolution` varchar(255) NOT NULL, `Price` decimal(10,2) NOT NULL, `Date` date DEFAULT NULL, `TransID` int(11) DEFAULT NULL, `PID` int(11) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Photo` ADD PRIMARY KEY (`PhotoID`), ADD KEY `PID` (`PID`), ADD KEY `TransID` (`TransID`); ALTER TABLE `Photo` ADD CONSTRAINT `Photo_ibfk_1` FOREIGN KEY (`PID`) REFERENCES `Photographer` (`PID`) ON DELETE CASCADE ON UPDATE CASCADE, ADD CONSTRAINT `Photo_ibfk_2` FOREIGN KEY (`TransID`) REFERENCES `Transaction` (`TransID`) ON DELETE SET NULL ON UPDATE SET NULL;</pre>
Populate Table	<pre>INSERT INTO `Photo` (`PhotoID`, `Speed`, `Film`, `F-Stop`, `Color/B&W`, `Resolution`, `Price`, `Date`, `TransID`, `PID`) VALUES (1, 0.25, 'CineStill', 3.00, 'Color', '1025x768', 20.00, '2020-03-13', 1, 1), [...], (2, 0.10, 'Fomapan', 4.00, 'B&W', '800x600', 30.00, '2020-03-14', 1, 2);</pre>

Photographer:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Photographer` (`PID` int(11) NOT NULL, `PName` varchar(255) NOT NULL, `PBDate` date NOT NULL, `PBio` varchar(255) NOT NULL, `PAddress` varchar(255) NOT NULL, `Color/B&W` varchar(255) NOT NULL, `PNationality` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Photographer` ADD PRIMARY KEY (`PID`), ADD UNIQUE KEY `PName` (`PName`,`PBDate`);</pre>
Populate Table	<pre>INSERT INTO `Photographer` (`PID`, `PName`, `PBDate`, `PBio`, `PAddress`, `Color/B&W`, `PNationality`) VALUES (1, 'Adam Smith', '1992-12-12', 'A photographer from Newport, VA.', '8C East Dogwood Drive\r\nNewport News, VA 23601', 'Color', 'American'), [...], (2, 'Lauren Ericson', '1993-06-06', 'A photographer from South Haven, Missouri.', '222 Catherine Rd.\r\nSouthaven, MS 38671', 'B&W', 'American');</pre>

Portrait:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Portrait` (`PhotoID` int(11) NOT NULL, `Head` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Portrait` ADD PRIMARY KEY (`PhotoID`); ALTER TABLE `Portrait` ADD CONSTRAINT `Portrait_ibfk_1` FOREIGN KEY (`PhotoID`) REFERENCES `Photo` (`PhotoID`) ON DELETE CASCADE ON UPDATE CASCADE;</pre>
Populate Table	<pre>INSERT INTO `Portrait` (`PhotoID`, `Head`) VALUES (1, 'Y'), [...], (4, 'Y');</pre>

Transaction:

Create Table	<pre>CREATE TABLE IF NOT EXISTS `Transaction` (`TransID` int(11) NOT NULL, `TDate` date NOT NULL, `CardNo` varchar(255) NOT NULL, `CardType` varchar(255) NOT NULL, `CardExpDate` varchar(10) NOT NULL, `TotalAmount` decimal(10,2) NOT NULL, `LoginName` varchar(255) NOT NULL);</pre>
Add Constraints To Table	<pre>ALTER TABLE `Transaction` ADD PRIMARY KEY (`TransID`), ADD KEY `LoginName` (`LoginName`); ALTER TABLE `Transaction` ADD CONSTRAINT `Transaction_ibfk_1` FOREIGN KEY (`LoginName`) REFERENCES `Customer` (`LoginName`) ON DELETE CASCADE ON UPDATE CASCADE;</pre>
Populate Table	<pre>INSERT INTO `Transaction` (`TransID`, `TDate`, `CardNo`, `CardType`, `CardExpDate`, `TotalAmount`, `LoginName`) VALUES (1, '2020-04-02', '378506309523884', 'American Express', '2025-10', 100.00, 'cphelps21'), [...], (2, '2020-04-02', '370218812263903', 'American Express', '2021-02', 21.00, 'llee12');</pre>

SQL from Query Portal: Note that the queries are SQL but may include a php variable that contains the input from the web application.

View Tables:

```
function selectTable($tableName)
{
    global $db;

    $sql = "SELECT *
            FROM $tableName";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

Specific Queries:

1. List customers who spent more than 100\$ for the photos.

```
function query1($val)
{
    global $db;

    $sql = "SELECT CName, LoginName
            FROM Customer
            WHERE LoginName IN (
                SELECT LoginName
                FROM Transaction
                WHERE TotalAmount > $val)";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```


2. List photos which were not bought.

```
function query2($val)
{
    global $db;

    if ($val=="were_not")
    {
        $sql = "SELECT *
                FROM Photo
                WHERE TransID IS NULL";
    }
    else if ($val=="were")
    {
        $sql = "SELECT *
                FROM Photo
                WHERE TransID > 0";
    }

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

3. List customers who bought all photos (portraits) in which a model X modeled.

```
function query3($val)
{
    global $db;

    if($val=="Deacon O'Sullivan")
    {
        $val = "Deacon O\\' Sullivan";
    }

    $sql = "SELECT g.LoginName, c.CName
            FROM
            (SELECT t.LoginName, count(p.PhotoID) as num, ttt.num as num2
            FROM Transaction t
            LEFT JOIN Photo p on t.TransID=p.TransID
            LEFT JOIN (
                SELECT tt.LoginName, count(pp.PhotoID) as num
                FROM Transaction tt
                LEFT JOIN Photo pp on tt.TransID=pp.TransID
                WHERE pp.PhotoID IN
                (SELECT PhotoID
                 FROM Models
                 WHERE MID =
                 (SELECT MID
                  FROM Model
                  WHERE MName = '$val'))
                GROUP BY tt.LoginName
            ) ttt ON t.LoginName = ttt.LoginName
            GROUP BY t.LoginName) g
            LEFT JOIN Customer c on g.LoginName=c.LoginName
            WHERE g.num=g.num2;";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

4. List photographers who influenced exclusively photographers who are US citizens.

```
function query4()
{
    global $db;

    $sql = "SELECT PID, PName
            FROM Photographer
            LEFT JOIN
            (SELECT a.EPID, COUNT(a.RPID) as numAmer, b.numInf
             FROM Influences a
             LEFT JOIN (
                 SELECT EPID, COUNT(RPID) as numInf
                 FROM Influences
                 GROUP BY EPID
             ) b ON b.EPID = a.EPID
            WHERE a.RPID IN (
                SELECT PID
                FROM Photographer
                WHERE PNationality='American')
            GROUP BY a.EPID) f ON f.EPID = PID
            WHERE f.numAmer = f.numInf;";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

5. List photographers which took only portrait photos.

```
function query5($val)
{
    global $db;

    $sql = "SELECT a.PID, a.PName
            FROM Photographer a
            LEFT JOIN
            (SELECT PID, COUNT(*) as numPhotos
             FROM Photo
             GROUP BY PID) b ON b.PID = a.PID
            LEFT JOIN
            (SELECT bb.PID, COUNT(aa.PhotoID) as numTypePhotos
             FROM $val aa
             LEFT JOIN Photo bb ON aa.PhotoID = bb.PhotoID
             GROUP BY bb.PID) c ON c.PID = a.PID
            WHERE b.numPhotos =c.numTypePhotos;";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

6. List transactions (transID) which contain more than 3 photos.

```
function query6($val)
{
    global $db;

    $sql = "SELECT t.TransID, t.TDate, t.LoginName, a.PhotoCount
            FROM Transaction t
            LEFT JOIN
            (SELECT TransID, count(*) as PhotoCount
             FROM Photo
             WHERE TransID IS NOT NULL
             GROUP BY TransID) a ON a.transID = t.transID
            WHERE a.PhotoCount > $val;";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

7. List models who modeled in all photos taken by photographer Y. (I wrote both interpretations)

```
function query7($val)
{
    global $db;
    //every pictures the model was in was taken by the photographer
    $sql = "SELECT a.MID, a.MName
            FROM Model a
            LEFT JOIN(
                SELECT MID, count(PhotoID) as numPhotosByPhotographer
                FROM Models
                WHERE PhotoID IN
                (SELECT PhotoID
                 FROM Photo
                 WHERE PID = (
                     SELECT PID
                     FROM Photographer
                     WHERE PName = '$val'))
                GROUP BY MID) b on b.MID=a.MID
            LEFT JOIN(
                SELECT MID, count(PhotoID) as numPhotos
                FROM Models m
                GROUP BY m.MID) c on c.MID=a.MID
            WHERE b.numPhotosByPhotographer=c.numPhotos;";
    //the model is every picture the photographer took
    $sql = "SELECT a.MID, a.MName
            FROM Model a
            LEFT JOIN(
                SELECT MID, count(PhotoID) AS photosWithPhotographer
                FROM Models
                WHERE PhotoID in (
                    SELECT PhotoID
                    FROM Photo
                    WHERE PID = (
                        SELECT PID
                        FROM Photographer
                        WHERE PName = '$val'))
                GROUP BY MID) b ON b.MID=a.MID
            WHERE b.photosWithPhotographer = (
                SELECT count(PhotoID)
                FROM Photo
                WHERE PID = (
                    SELECT PID
                    FROM Photographer
                    WHERE PName = '$val'))";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

8. Rank the photographers by the total cost (sum of prices) of the photos they took.

```
function query8()
{
    global $db;

    $sql = "SELECT b.PName, a.PID, sum(a.price)
            FROM Photo a
            LEFT JOIN (
                SELECT PName, PID
                FROM Photographer) b ON b.PID=a.PID
            GROUP BY a.PID
            ORDER BY sum(a.price) DESC";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

9. Delete from relation Photo the photo with photoID=X.

```
function query9($val)
{
    global $db;

    $sql = "DELETE FROM Photo WHERE PhotoID=$val";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );
}
```

10. Update the photographer name of the photo with photoID=X to Y.

```
function query10($val, $val2)
{
    global $db;

    $sql = "UPDATE Photographer
            SET PName = '$val2'
            WHERE PID = (
                SELECT PID
                FROM Photo
                WHERE PhotoID = $val);";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );
}
```


11. Compute total sales per customer

```
function query11()
{
    global $db;

    $sql = "SELECT b.CName, a.LoginName, count(*) as '# of Transactions', sum(a.TotalAmount) as 'Total Sales $"
        FROM Transaction a
        LEFT JOIN (
            SELECT CName, LoginName
            FROM Customer) b ON b.LoginName=a.LoginName
        GROUP BY a.LoginName
        ORDER BY sum(a.TotalAmount) DESC";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

12. Compute total sales per photographer sorted by photographer

```
function query12()
{
    global $db;

    $sql = "SELECT a.PID, b.PName, count(TransID) as '# of Photos Sold', sum(Price) as 'Total Sales $"
        FROM Photo a
        LEFT JOIN (
            SELECT PID, PNAME
            FROM Photographer) b on a.PID=b.PID
        WHERE TransID IS NOT NULL
        GROUP BY a.PID
        ORDER BY sum(Price) DESC;";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

13. Compute total sales by photo type (portrait, landscape etc.)

```
function query13()
{
    global $db;

    $sql = "(SELECT 'Landscape' as 'Photo Type', count(TransID) as '# of Photos Sold', sum(Price) as 'Total Sales $'
    FROM Photo a
    WHERE TransID IS NOT NULL AND PhotoID IN (
        SELECT PhotoID
        FROM Landscape)
    GROUP BY 'Photo Type'
    ORDER BY sum(Price) DESC)

    UNION

    (SELECT 'Portrait' as 'Photo Type', count(TransID) as '# of Photos Sold', sum(Price) as 'Total Sales $'
    FROM Photo a
    WHERE TransID IS NOT NULL AND PhotoID IN (
        SELECT PhotoID
        FROM Portrait)
    GROUP BY 'Photo Type'
    ORDER BY sum(Price) DESC)

    UNION

    (SELECT 'Abstract' as 'Photo Type', count(TransID) as '# of Photos Sold', sum(Price) as 'Total Sales $'
    FROM Photo a
    WHERE TransID IS NOT NULL AND PhotoID IN (
        SELECT PhotoID
        FROM Abstract)
    GROUP BY 'Photo Type'
    ORDER BY sum(Price) DESC);";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

14. Compute top n dates (in a total sales per date list)

```
function selectTable($tableName)
{
    global $db;

    $sql = "SELECT *
    FROM $tableName";

    ( $result = mysqli_query($db, $sql) ) or die( mysqli_error($db) );

    return $result;
}
```

To see the result of any of these queries execute them at:

<https://web.njit.edu/~mdm56/cs331/deliverable3/QueryPortal.php?func=query>

There are many instances of sql used in other functions for other webpages. To see those please look at the *MyFunctions.php*. That file contains all the sql used in the entire project including the functions you see above.