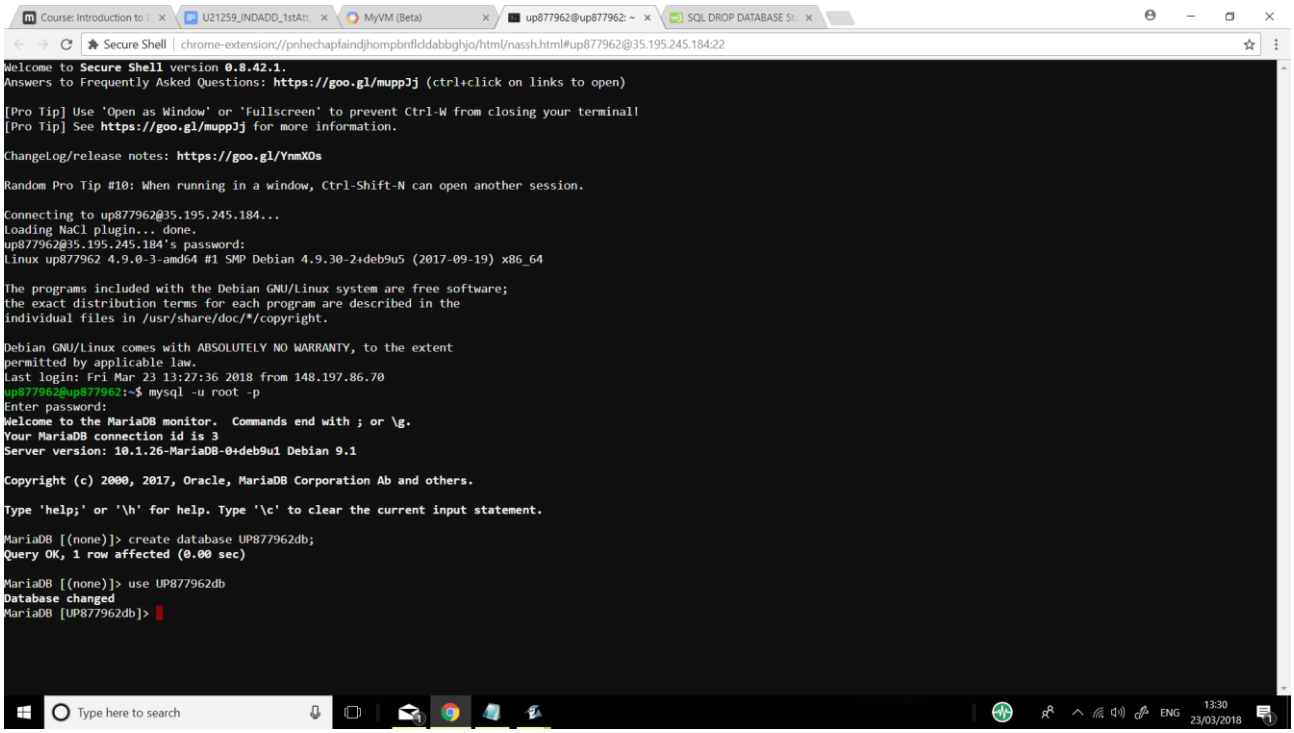
Submission 3: The Database

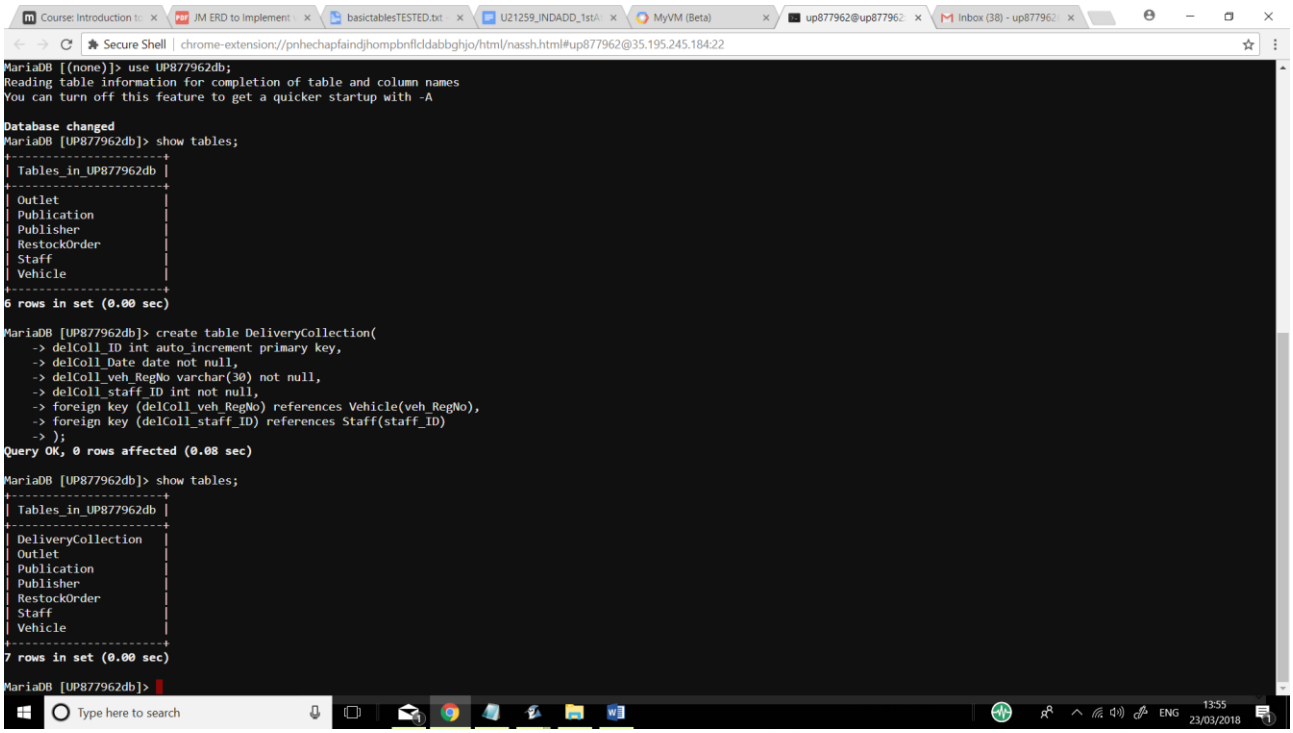
Task 3a: Database Creation

1) Screenshot of create and use commands:



2) Screenshots of table creation

Table DeliveryCollection:



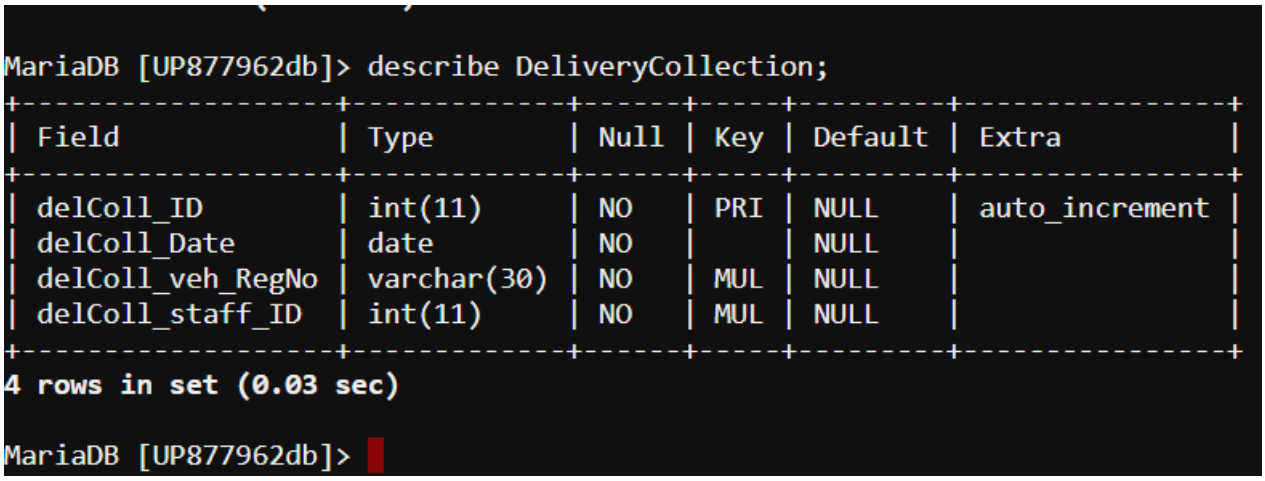
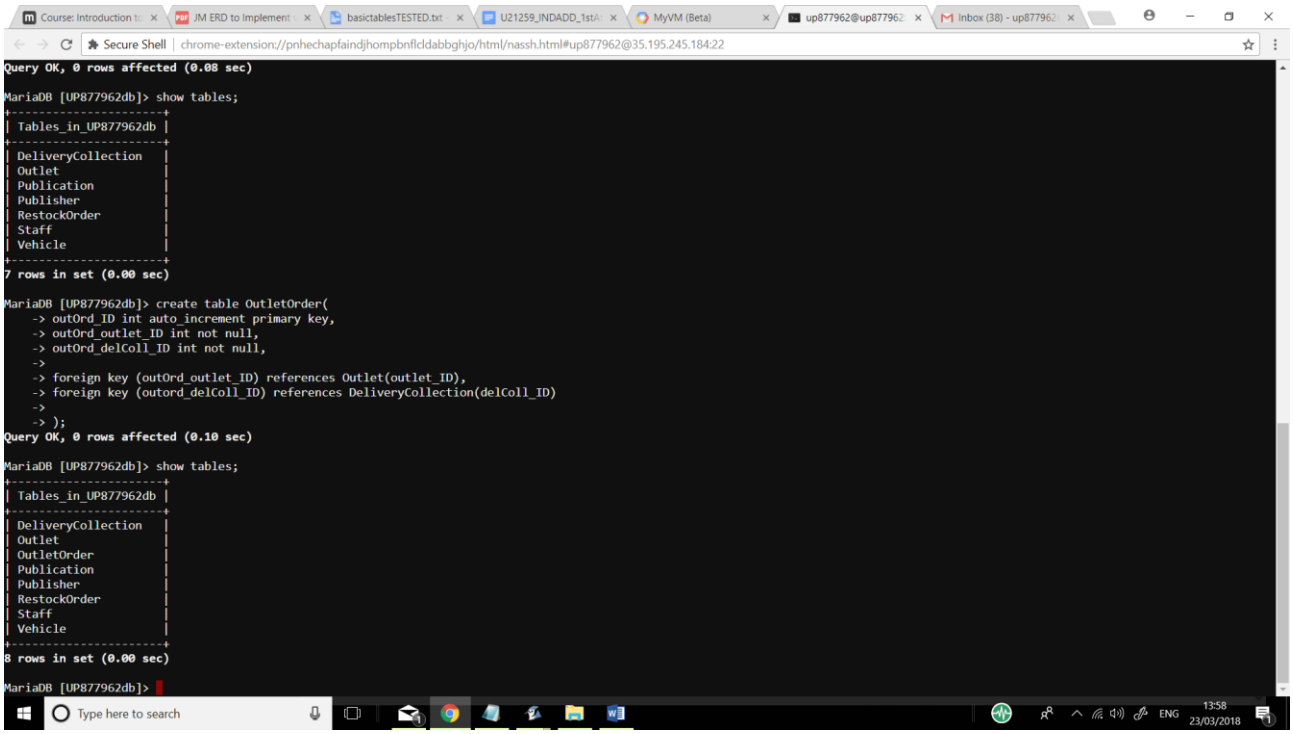
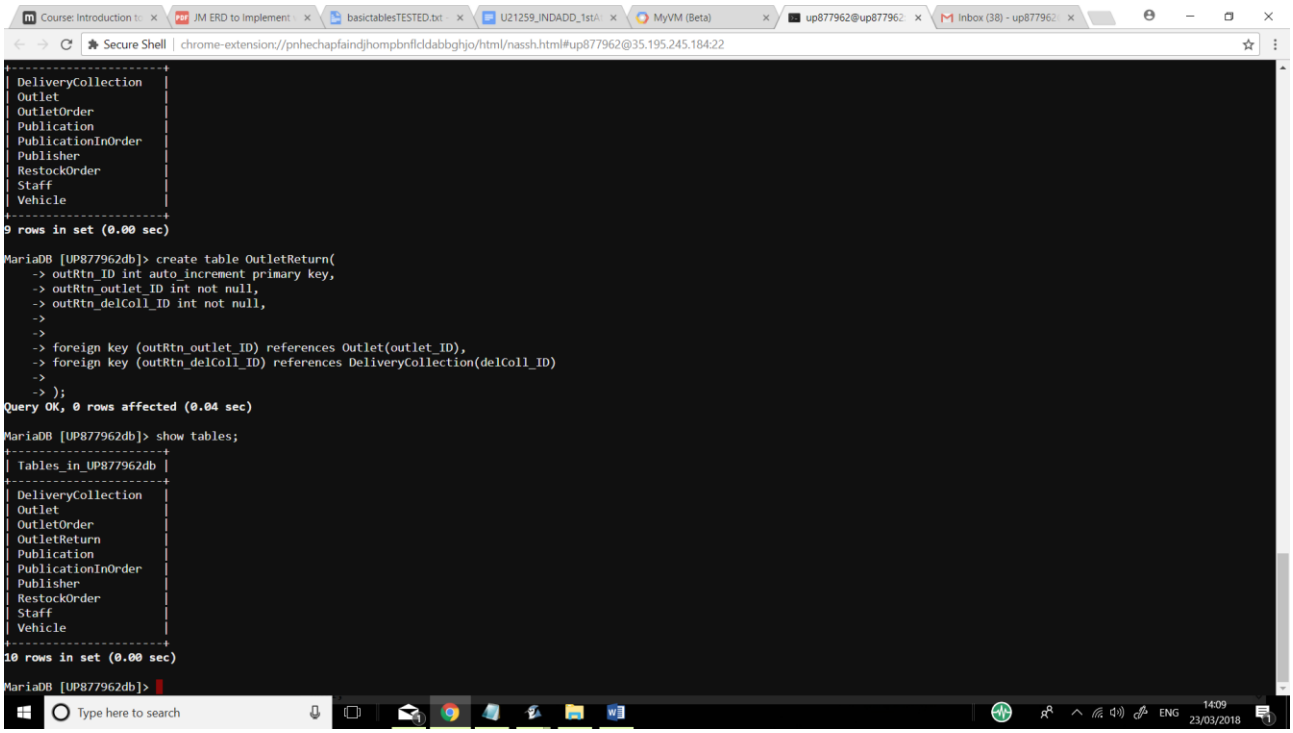


Table Outlet Order



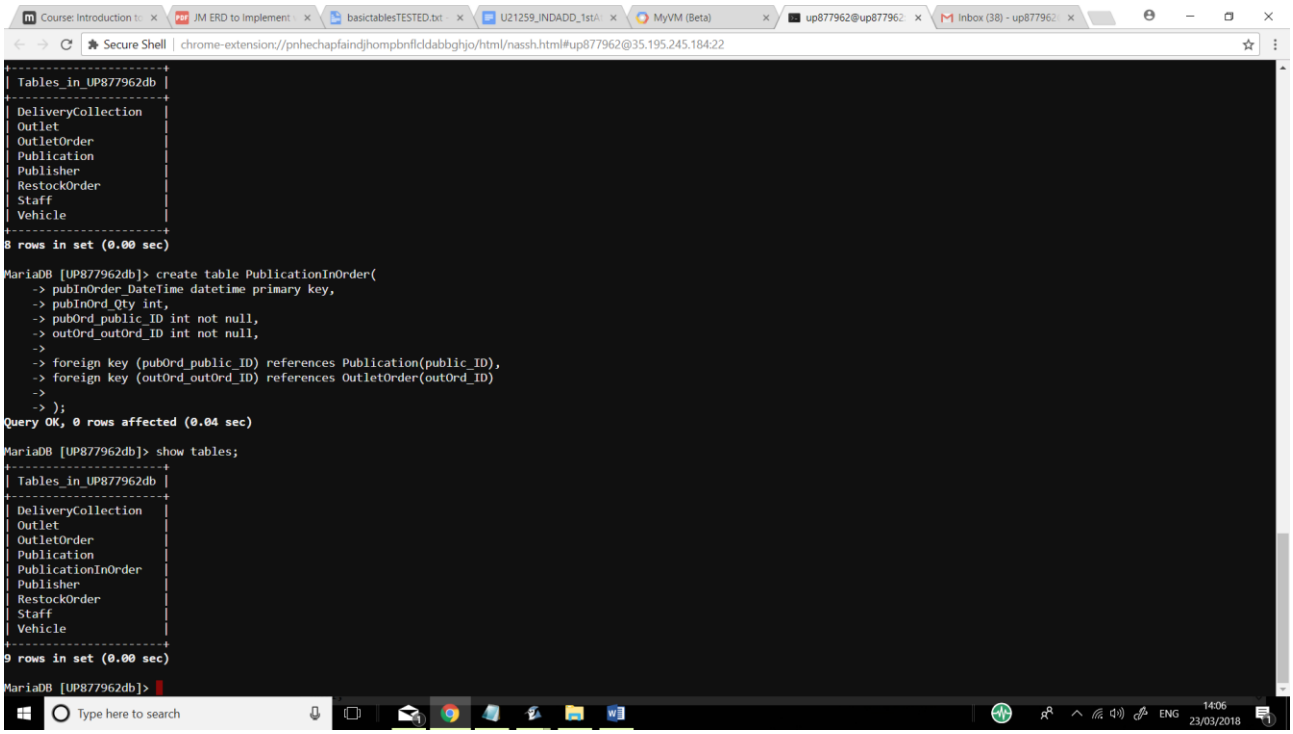

```
MariaDB [UP877962db]> describe OutletOrder;
+-------------------+---------+------+-----+---------+----------------+
| Field             | Type    | Null | Key | Default | Extra          |
+-------------------+---------+------+-----+---------+----------------+
| outOrd_ID         | int(11) | NO   | PRI | NULL    | auto_increment |
| outOrd_outlet_ID  | int(11) | NO   | MUL | NULL    |                |
| outOrd_delColl_ID | int(11) | NO   | MUL | NULL    |                |
+-------------------+---------+------+-----+---------+----------------+
3 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table Outlet Return



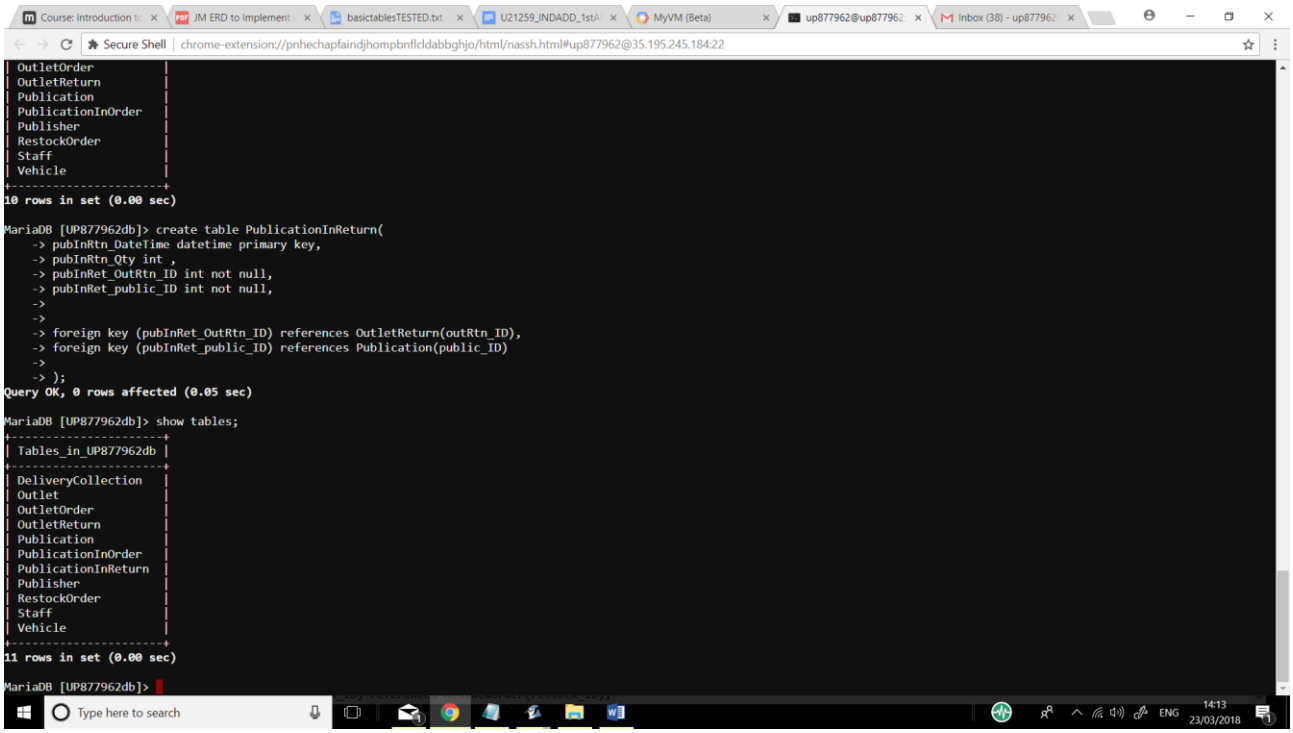

```
MariaDB [UP877962db]> describe OutletReturn;
+--------------------+---------+------+-----+---------+----------------+
| Field              | Type    | Null | Key | Default | Extra          |
+--------------------+---------+------+-----+---------+----------------+
| outRtn_ID          | int(11) | NO   | PRI | NULL    | auto_increment |
| outRtn_outlet_ID   | int(11) | NO   | MUL | NULL    |                |
| outRtn_delColl_ID  | int(11) | NO   | MUL | NULL    |                |
+--------------------+---------+------+-----+---------+----------------+
3 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table PublicationInOrder



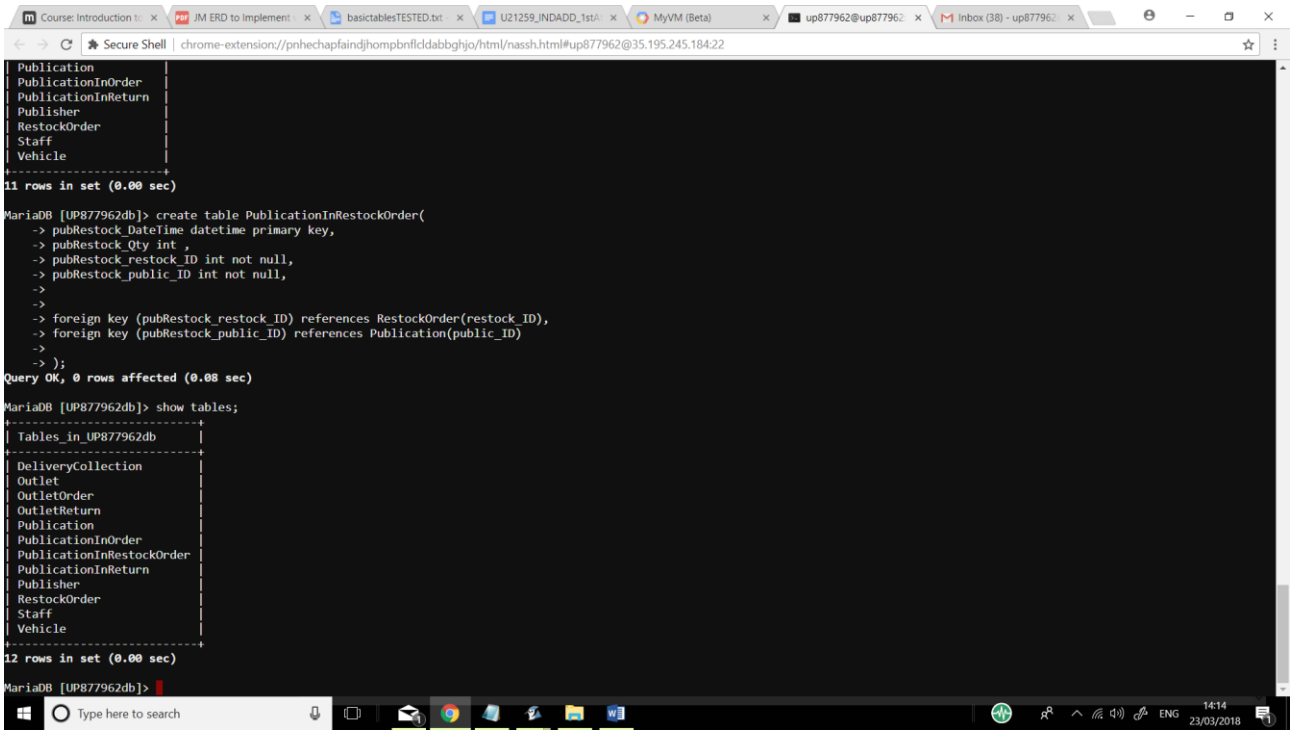

```
MariaDB [UP877962db]> describe PublicationInOrder;
+----------------------+----------+------+-----+---------+-------+
| Field                | Type     | Null | Key | Default | Extra |
+----------------------+----------+------+-----+---------+-------+
| pubInOrder_DateTime  | datetime | NO   | PRI | NULL    |       |
| pubInOrd_Qty         | int(11)  | YES  |     | NULL    |       |
| pubOrd_public_ID     | int(11)  | NO   | MUL | NULL    |       |
| outOrd_outOrd_ID     | int(11)  | NO   | MUL | NULL    |       |
+----------------------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table PublicationInReturn



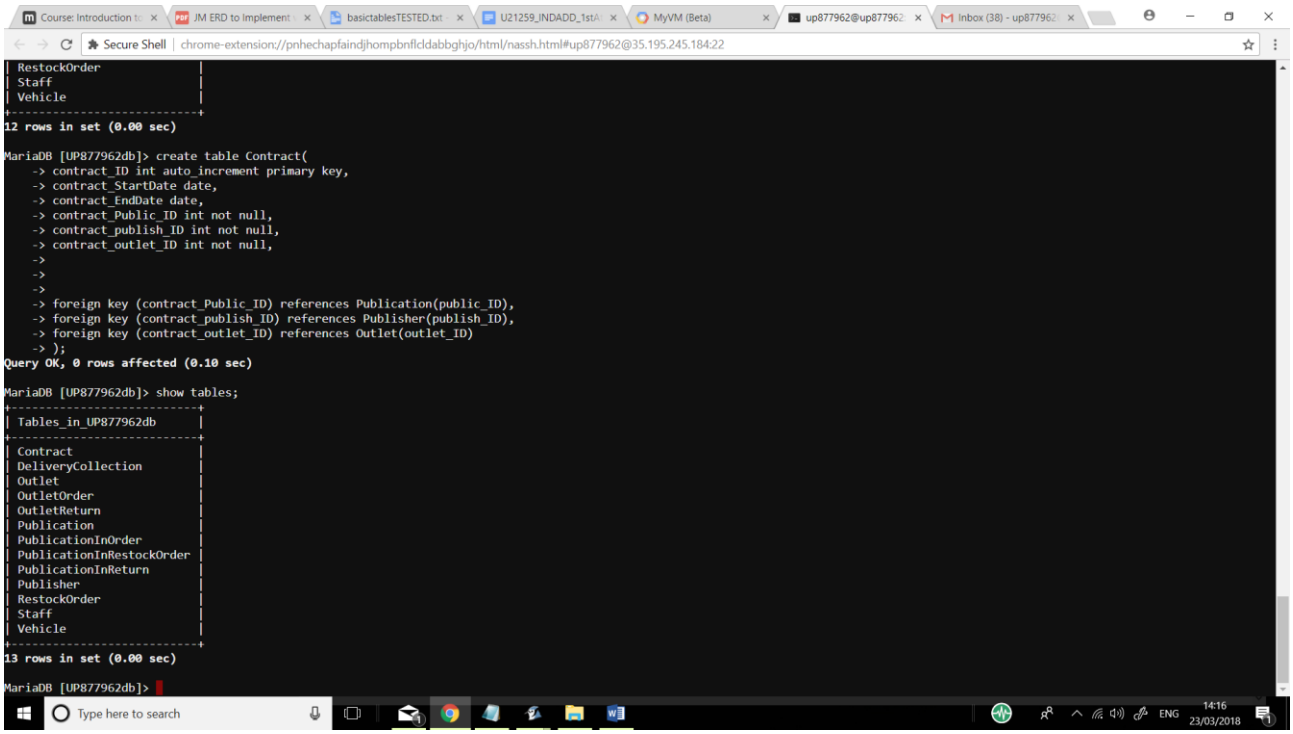

```
MariaDB [UP877962db]> describe PublicationInReturn;
+---------------------+----------+------+-----+---------+-------+
| Field               | Type     | Null | Key | Default | Extra |
+---------------------+----------+------+-----+---------+-------+
| pubInRtn_DateTime   | datetime | NO   | PRI | NULL    |       |
| pubInRtn_Qty        | int(11)  | YES  |     | NULL    |       |
| pubInRet_OutRtn_ID  | int(11)  | NO   | MUL | NULL    |       |
| pubInRet_public_ID  | int(11)  | NO   | MUL | NULL    |       |
+---------------------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table PublicationInRestockOrder




```
MariaDB [UP877962db]> describe PublicationInRestockOrder;
+-------------------------+----------+------+-----+---------+-------+
| Field                   | Type     | Null | Key | Default | Extra |
+-------------------------+----------+------+-----+---------+-------+
| pubRestock_DateTime     | datetime | NO   | PRI | NULL    |       |
| pubRestock_Qty          | int(11)  | YES  |     | NULL    |       |
| pubRestock_restock_ID   | int(11)  | NO   | MUL | NULL    |       |
| pubRestock_public_ID    | int(11)  | NO   | MUL | NULL    |       |
+-------------------------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table Contract

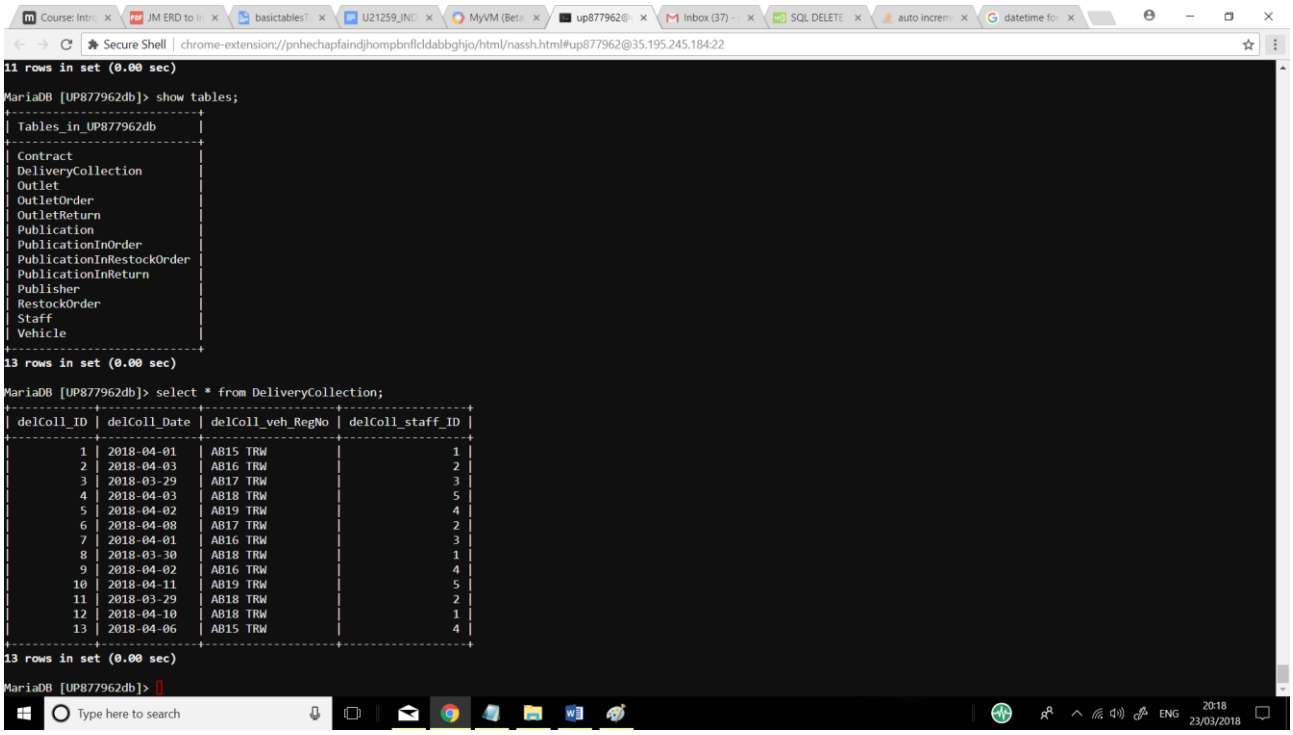


```
| RestockOrder              |
| Staff                     |
| Vehicle                   |
+---------------------------+
12 rows in set (0.00 sec)

MariaDB [UP877962db]> create table Contract(
    -> contract_ID int auto_increment primary key,
    -> contract_StartDate date,
    -> contract_EndDate date,
    -> contract_Public_ID int not null,
    -> contract_publish_ID int not null,
    -> contract_outlet_ID int not null,
    ->
    ->
    ->
    -> foreign key (contract_Public_ID) references Publication(public_ID),
    -> foreign key (contract_publish_ID) references Publisher(publish_ID),
    -> foreign key (contract_outlet_ID) references Outlet(outlet_ID)
    -> );
Query OK, 0 rows affected (0.10 sec)

MariaDB [UP877962db]> show tables;
+---------------------------+
| Tables_in_UP877962db      |
+---------------------------+
| Contract                  |
| DeliveryCollection        |
| Outlet                    |
| OutletOrder               |
| OutletReturn              |
| Publication               |
| PublicationInOrder        |
| PublicationInRestockOrder |
| PublicationInReturn       |
| Publisher                 |
| RestockOrder              |
| Staff                     |
| Vehicle                   |
+---------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

```
MariaDB [UP877962db]> describe Contract;
+----------------------+---------+------+-----+---------+----------------+
| Field                | Type    | Null | Key | Default | Extra          |
+----------------------+---------+------+-----+---------+----------------+
| contract_ID          | int(11) | NO   | PRI | NULL    | auto_increment |
| contract_StartDate   | date    | YES  |     | NULL    |                |
| contract_EndDate     | date    | YES  |     | NULL    |                |
| contract_Public_ID   | int(11) | NO   | MUL | NULL    |                |
| contract_publish_ID  | int(11) | NO   | MUL | NULL    |                |
| contract_outlet_ID   | int(11) | NO   | MUL | NULL    |                |
+----------------------+---------+------+-----+---------+----------------+
6 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

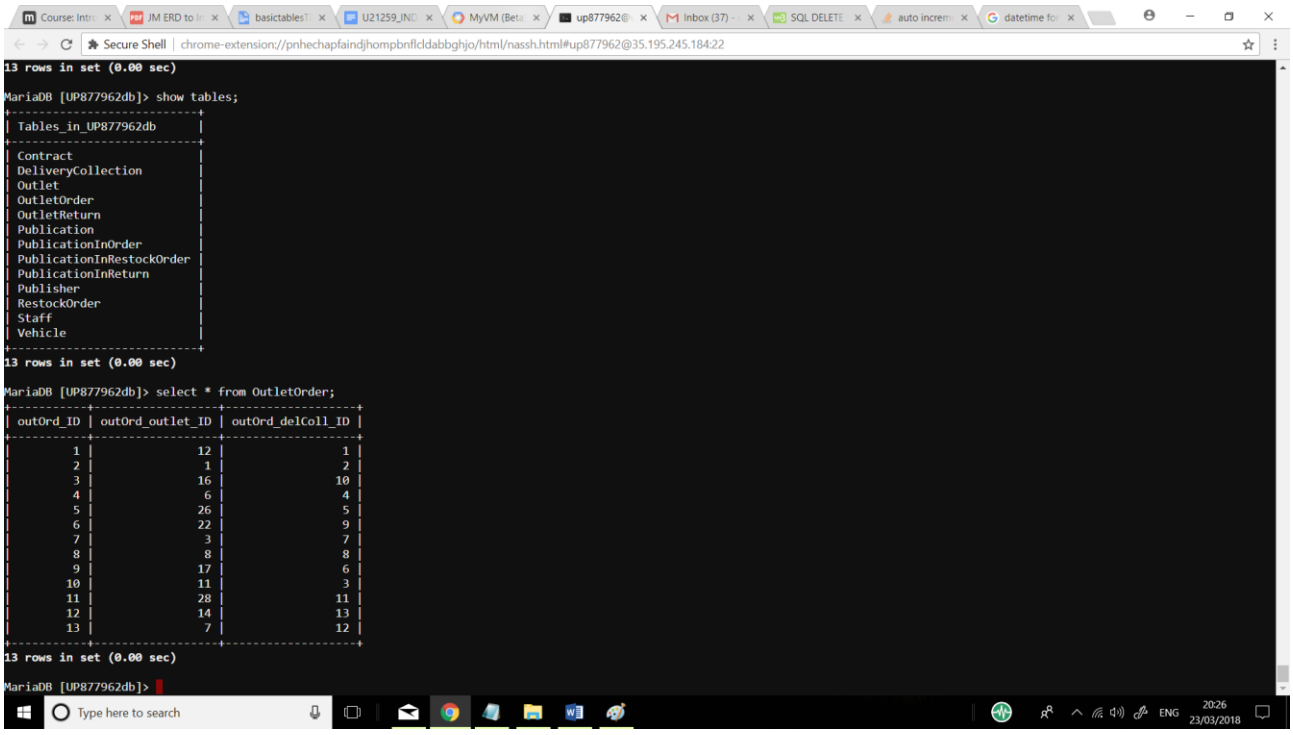
Screenshots of table population

Table DeliveryCollection



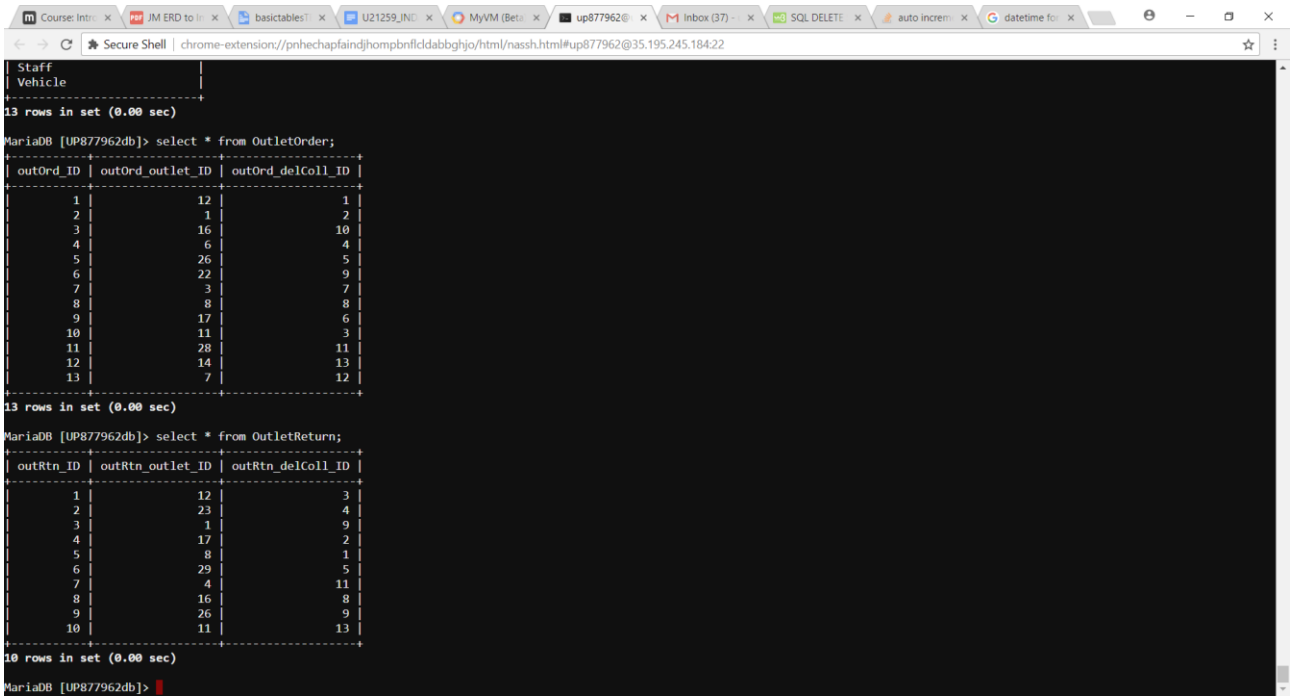
```
11 rows in set (0.00 sec)

MariaDB [UP877962db]> show tables;
+---------------------------+
| Tables_in_UP877962db      |
+---------------------------+
| Contract                  |
| DeliveryCollection        |
| Outlet                    |
| OutletOrder               |
| OutletReturn              |
| Publication               |
| PublicationInOrder        |
| PublicationInRestockOrder |
| PublicationInReturn       |
| Publisher                 |
| RestockOrder              |
| Staff                     |
| Vehicle                   |
+---------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from DeliveryCollection;
+------------+--------------+-------------------+-------------------+
| delColl_ID | delColl_Date | delColl_veh_RegNo | delColl_staff_ID |
+------------+--------------+-------------------+-------------------+
|          1 | 2018-04-01   | AB15 TRW          |                 1 |
|          2 | 2018-04-03   | AB16 TRW          |                 2 |
|          3 | 2018-03-29   | AB17 TRW          |                 3 |
|          4 | 2018-04-03   | AB18 TRW          |                 5 |
|          5 | 2018-04-02   | AB19 TRW          |                 4 |
|          6 | 2018-04-08   | AB17 TRW          |                 2 |
|          7 | 2018-04-01   | AB16 TRW          |                 3 |
|          8 | 2018-03-30   | AB18 TRW          |                 1 |
|          9 | 2018-04-02   | AB16 TRW          |                 4 |
|         10 | 2018-04-11   | AB19 TRW          |                 5 |
|         11 | 2018-03-29   | AB18 TRW          |                 2 |
|         12 | 2018-04-10   | AB18 TRW          |                 1 |
|         13 | 2018-04-06   | AB15 TRW          |                 4 |
+------------+--------------+-------------------+-------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table Outlet Order



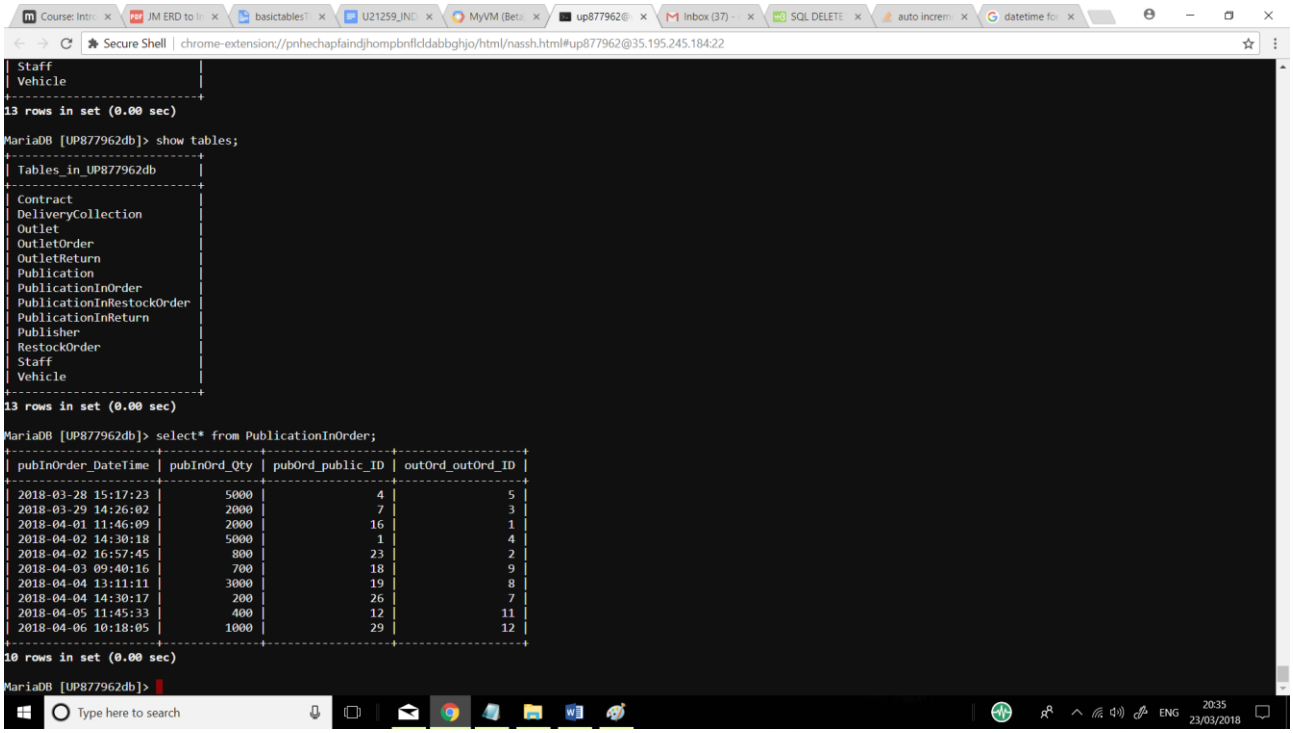
```
13 rows in set (0.00 sec)

MariaDB [UP877962db]> show tables;
+---------------------------+
| Tables_in_UP877962db      |
+---------------------------+
| Contract                  |
| DeliveryCollection        |
| Outlet                    |
| OutletOrder               |
| OutletReturn              |
| Publication               |
| PublicationInOrder        |
| PublicationInRestockOrder |
| PublicationInReturn       |
| Publisher                 |
| RestockOrder              |
| Staff                     |
| Vehicle                   |
+---------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from OutletOrder;
+-----------+-----------------+-----------------+
| outOrd_ID | outOrd_outlet_ID | outOrd_delColl_ID |
+-----------+-----------------+-----------------+
|         1 |              12 |               1 |
|         2 |               1 |               2 |
|         3 |              16 |              10 |
|         4 |               6 |               4 |
|         5 |              26 |               5 |
|         6 |              22 |               9 |
|         7 |               3 |               7 |
|         8 |               8 |               8 |
|         9 |              17 |               6 |
|        10 |              11 |               3 |
|        11 |              28 |              11 |
|        12 |              14 |              13 |
|        13 |               7 |              12 |
+-----------+-----------------+-----------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table Outlet Return



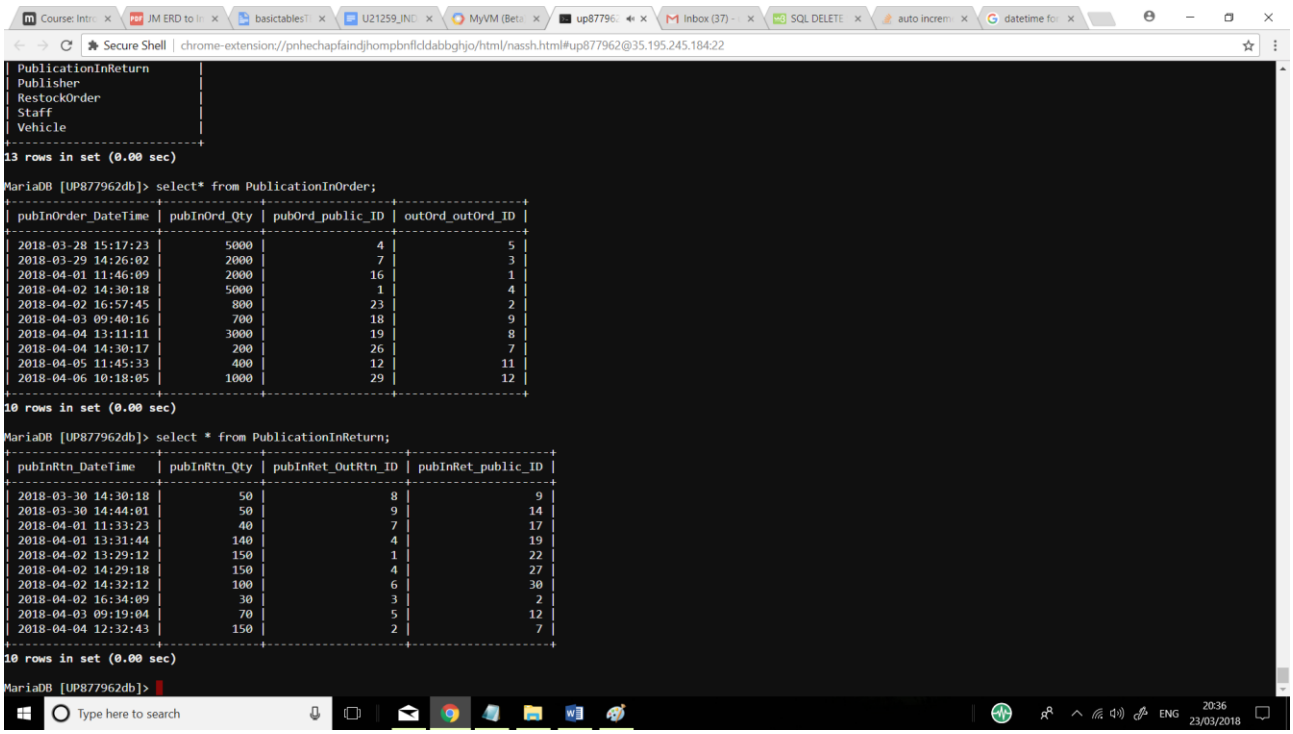
```
| Staff                  |
| Vehicle                |
+------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from OutletOrder;
+-----------+-----------------+------------------+
| outOrd_ID | outOrd_outlet_ID | outOrd_delColl_ID |
+-----------+-----------------+------------------+
|         1 |              12 |                1 |
|         2 |               1 |                2 |
|         3 |              16 |               10 |
|         4 |               6 |                4 |
|         5 |              26 |                5 |
|         6 |              22 |                9 |
|         7 |               3 |                7 |
|         8 |               8 |                8 |
|         9 |              17 |                6 |
|        10 |              11 |                3 |
|        11 |              28 |               11 |
|        12 |              14 |               13 |
|        13 |               7 |               12 |
+-----------+-----------------+------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from OutletReturn;
+-----------+-----------------+------------------+
| outRtn_ID | outRtn_outlet_ID | outRtn_delColl_ID |
+-----------+-----------------+------------------+
|         1 |              12 |                3 |
|         2 |              23 |                4 |
|         3 |               1 |                9 |
|         4 |              17 |                2 |
|         5 |               8 |                1 |
|         6 |              29 |                5 |
|         7 |               4 |               11 |
|         8 |              16 |                8 |
|         9 |              26 |                9 |
|        10 |              11 |               13 |
+-----------+-----------------+------------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table PublicationInOrder



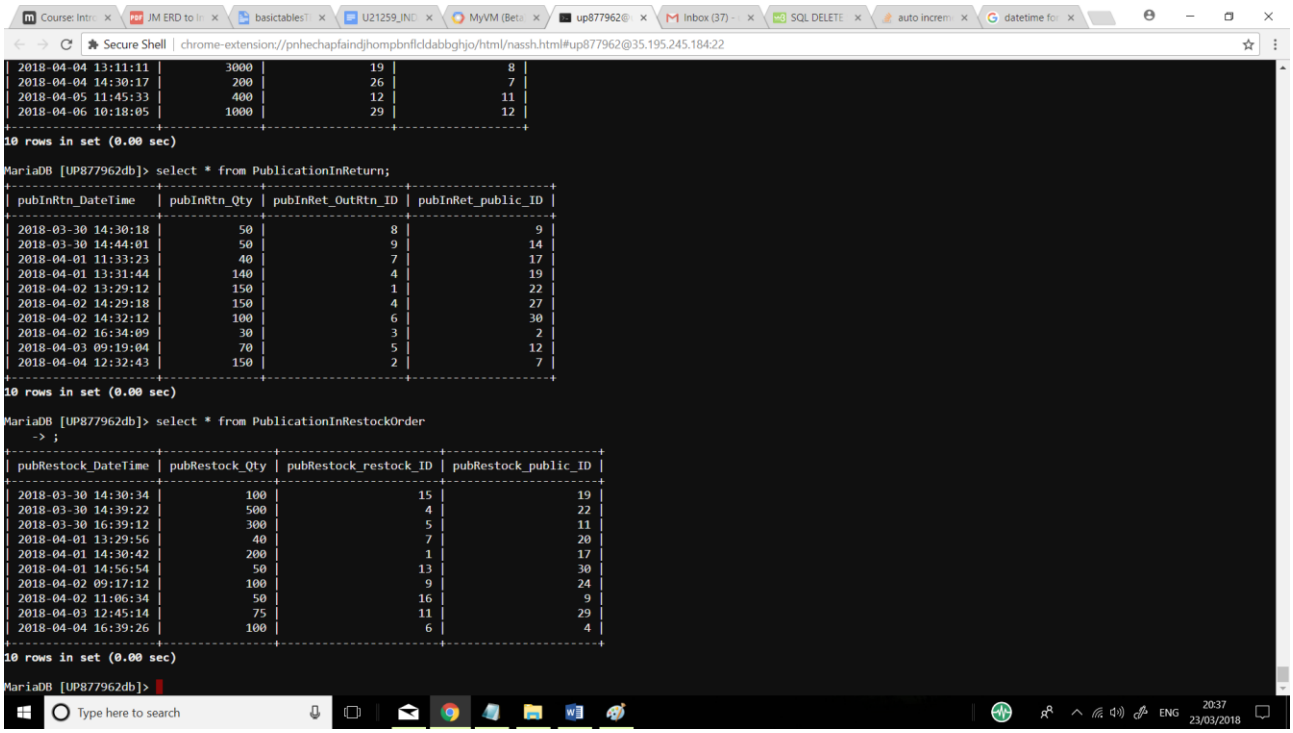
```
| Staff                  |
| Vehicle                |
+------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> show tables;
+---------------------------+
| Tables_in_UP877962db      |
+---------------------------+
| Contract                  |
| DeliveryCollection        |
| Outlet                    |
| OutletOrder               |
| OutletReturn              |
| Publication               |
| PublicationInOrder        |
| PublicationInRestockOrder |
| PublicationInReturn       |
| Publisher                 |
| RestockOrder              |
| Staff                     |
| Vehicle                   |
+---------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> select* from PublicationInOrder;
+---------------------+-------------+-----------------+-----------------+
| pubInOrder_DateTime | pubInOrd_Qty | pubOrd_public_ID | outOrd_outOrd_ID |
+---------------------+-------------+-----------------+-----------------+
| 2018-03-28 15:17:23 |        5000 |               4 |               5 |
| 2018-03-29 14:26:02 |        2000 |               7 |               3 |
| 2018-04-01 11:46:09 |        2000 |              16 |               1 |
| 2018-04-02 14:30:18 |        5000 |               1 |               4 |
| 2018-04-02 16:57:45 |         800 |              23 |               2 |
| 2018-04-03 09:40:16 |         700 |              18 |               9 |
| 2018-04-04 13:11:11 |        3000 |              19 |               8 |
| 2018-04-04 14:30:17 |         200 |              26 |               7 |
| 2018-04-05 11:45:33 |         400 |              12 |              11 |
| 2018-04-06 10:18:05 |        1000 |              29 |              12 |
+---------------------+-------------+-----------------+-----------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table PublicationInReturn



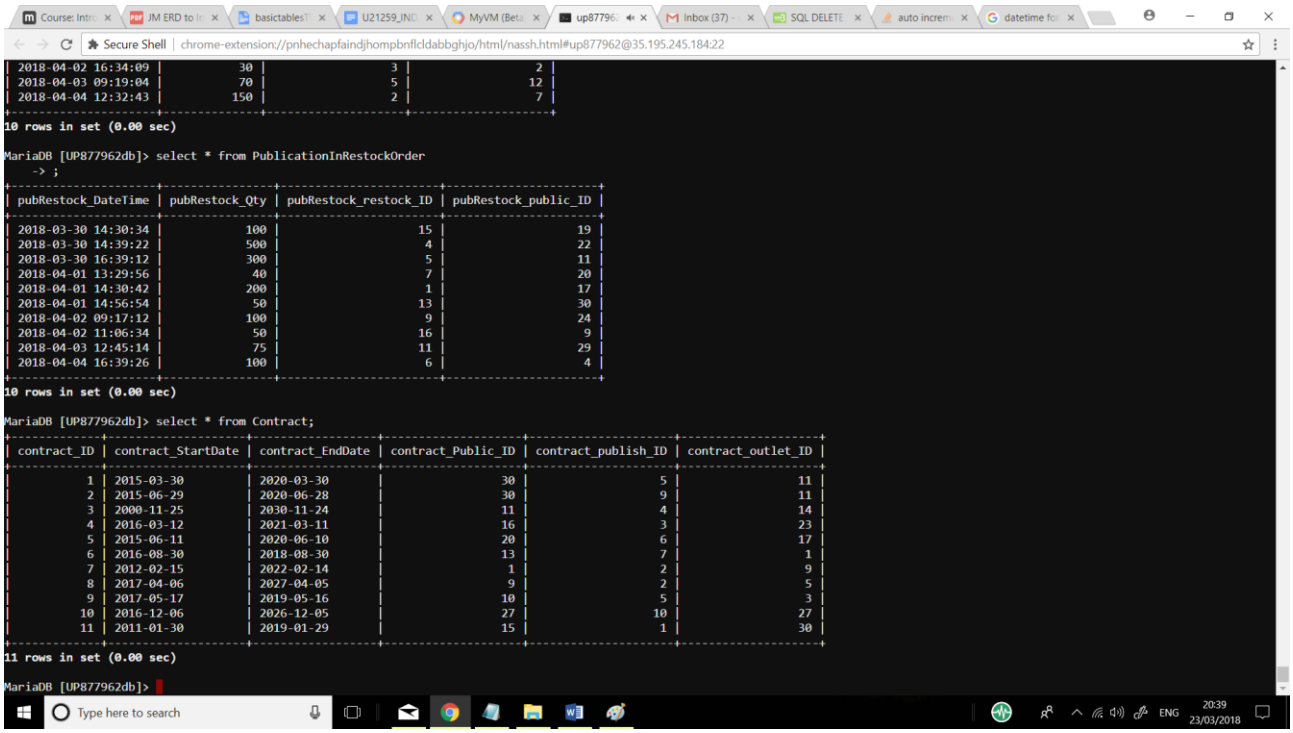
```
| PublicationInReturn       |
| Publisher                 |
| RestockOrder              |
| Staff                     |
| Vehicle                   |
+---------------------------+
13 rows in set (0.00 sec)

MariaDB [UP877962db]> select* from PublicationInOrder;
+---------------------+-------------+-----------------+-----------------+
| pubInOrder_DateTime | pubInOrd_Qty | pubOrd_public_ID | outOrd_outOrd_ID |
+---------------------+-------------+-----------------+-----------------+
| 2018-03-28 15:17:23 |         5000 |               4 |               5 |
| 2018-03-29 14:26:02 |         2000 |               7 |               3 |
| 2018-04-01 11:46:09 |         2000 |              16 |               1 |
| 2018-04-02 14:30:18 |         5000 |               1 |               4 |
| 2018-04-02 16:57:45 |          800 |              23 |               2 |
| 2018-04-03 09:40:16 |          700 |              18 |               9 |
| 2018-04-04 13:11:11 |         3000 |              19 |               8 |
| 2018-04-04 14:30:17 |          200 |              26 |               7 |
| 2018-04-05 11:45:33 |          400 |              12 |              11 |
| 2018-04-06 10:18:05 |         1000 |              29 |              12 |
+---------------------+-------------+-----------------+-----------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from PublicationInReturn;
+---------------------+-------------+-------------------+--------------------+
| pubInRtn_DateTime   | pubInRtn_Qty | pubInRet_OutRtn_ID | pubInRet_public_ID |
+---------------------+-------------+-------------------+--------------------+
| 2018-03-30 14:30:18 |          50 |                 8 |                  9 |
| 2018-03-30 14:44:01 |          50 |                 9 |                 14 |
| 2018-04-01 11:33:23 |          40 |                 7 |                 17 |
| 2018-04-01 13:31:44 |         140 |                 4 |                 19 |
| 2018-04-02 13:29:12 |         150 |                 1 |                 22 |
| 2018-04-02 14:29:18 |         150 |                 4 |                 27 |
| 2018-04-02 14:32:12 |         100 |                 6 |                 30 |
| 2018-04-02 16:34:09 |          30 |                 3 |                  2 |
| 2018-04-03 09:19:04 |          70 |                 5 |                 12 |
| 2018-04-04 12:32:43 |         150 |                 2 |                  7 |
+---------------------+-------------+-------------------+--------------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table PublicationInRestockOrder



```
| 2018-04-04 13:11:11 |         3000 |              19 |               8 |
| 2018-04-04 14:30:17 |          200 |              26 |               7 |
| 2018-04-05 11:45:33 |          400 |              12 |              11 |
| 2018-04-06 10:18:05 |         1000 |              29 |              12 |
+---------------------+-------------+-----------------+-----------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from PublicationInReturn;
+---------------------+-------------+-------------------+--------------------+
| pubInRtn_DateTime   | pubInRtn_Qty | pubInRet_OutRtn_ID | pubInRet_public_ID |
+---------------------+-------------+-------------------+--------------------+
| 2018-03-30 14:30:18 |          50 |                 8 |                  9 |
| 2018-03-30 14:44:01 |          50 |                 9 |                 14 |
| 2018-04-01 11:33:23 |          40 |                 7 |                 17 |
| 2018-04-01 13:31:44 |         140 |                 4 |                 19 |
| 2018-04-02 13:29:12 |         150 |                 1 |                 22 |
| 2018-04-02 14:29:18 |         150 |                 4 |                 27 |
| 2018-04-02 14:32:12 |         100 |                 6 |                 30 |
| 2018-04-02 16:34:09 |          30 |                 3 |                  2 |
| 2018-04-03 09:19:04 |          70 |                 5 |                 12 |
| 2018-04-04 12:32:43 |         150 |                 2 |                  7 |
+---------------------+-------------+-------------------+--------------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from PublicationInRestockOrder
    -> ;
+---------------------+---------------+---------------------+---------------------+
| pubRestock_DateTime | pubRestock_Qty | pubRestock_restock_ID | pubRestock_public_ID |
+---------------------+---------------+---------------------+---------------------+
| 2018-03-30 14:30:34 |           100 |                  15 |                  19 |
| 2018-03-30 14:39:22 |           500 |                   4 |                  22 |
| 2018-03-30 16:39:12 |           300 |                   5 |                  11 |
| 2018-04-01 13:29:56 |            40 |                   7 |                  20 |
| 2018-04-01 14:30:42 |           200 |                   1 |                  17 |
| 2018-04-01 14:56:54 |            50 |                  13 |                  30 |
| 2018-04-02 09:17:12 |           100 |                   9 |                  24 |
| 2018-04-02 11:06:34 |            50 |                  16 |                   9 |
| 2018-04-03 12:45:14 |            75 |                  11 |                  29 |
| 2018-04-04 16:39:26 |           100 |                   6 |                   4 |
+---------------------+---------------+---------------------+---------------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Table Contract



```
| 2018-04-02 16:34:09 |          30 |                3 |                2 |
| 2018-04-03 09:19:04 |          70 |                5 |               12 |
| 2018-04-04 12:32:43 |         150 |                2 |                7 |
+---------------------+-------------+------------------+------------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from PublicationInRestockOrder
    -> ;
+---------------------+---------------+----------------------+---------------------+
| pubRestock_DateTime | pubRestock_Qty | pubRestock_restock_ID | pubRestock_public_ID |
+---------------------+---------------+----------------------+---------------------+
| 2018-03-30 14:30:34 |           100 |                   15 |                  19 |
| 2018-03-30 14:39:22 |           500 |                    4 |                  22 |
| 2018-03-30 16:39:12 |           300 |                    5 |                  11 |
| 2018-04-01 13:29:56 |            40 |                    7 |                  20 |
| 2018-04-01 14:30:42 |           200 |                    1 |                  17 |
| 2018-04-01 14:56:54 |            50 |                   13 |                  30 |
| 2018-04-02 09:17:12 |           100 |                    9 |                  24 |
| 2018-04-02 11:06:34 |            50 |                   16 |                   9 |
| 2018-04-03 12:45:14 |            75 |                   11 |                  29 |
| 2018-04-04 16:39:26 |           100 |                    6 |                   4 |
+---------------------+---------------+----------------------+---------------------+
10 rows in set (0.00 sec)

MariaDB [UP877962db]> select * from Contract;
+-------------+--------------------+------------------+--------------------+--------------------+--------------------+
| contract_ID | contract_StartDate | contract_EndDate | contract_Public_ID | contract_publish_ID | contract_outlet_ID |
+-------------+--------------------+------------------+--------------------+--------------------+--------------------+
|           1 | 2015-03-30         | 2020-03-30       |                 30 |                  5 |                 11 |
|           2 | 2015-06-29         | 2020-06-28       |                 30 |                  9 |                 11 |
|           3 | 2000-11-25         | 2030-11-24       |                 11 |                  4 |                 14 |
|           4 | 2016-03-12         | 2021-03-11       |                 16 |                  3 |                 23 |
|           5 | 2015-06-11         | 2020-06-10       |                 20 |                  6 |                 17 |
|           6 | 2016-08-30         | 2018-08-30       |                 13 |                  7 |                  1 |
|           7 | 2012-02-15         | 2022-02-14       |                  1 |                  2 |                  9 |
|           8 | 2017-04-06         | 2027-04-05       |                  9 |                  2 |                  5 |
|           9 | 2017-05-17         | 2019-05-16       |                 10 |                  5 |                  3 |
|          10 | 2016-12-06         | 2026-12-05       |                 27 |                 10 |                 27 |
|          11 | 2011-01-30         | 2019-01-29       |                 15 |                  1 |                 30 |
+-------------+--------------------+------------------+--------------------+--------------------+--------------------+
11 rows in set (0.00 sec)

MariaDB [UP877962db]>
```

Task 3b: General SQL Queries

Query 1

Query Description and why it's of use to JM:

This query pulls up the relevant information about the deliveries and collections associated with a driver on a given date. This could be of use if drivers are unable to work that day or just to check what they are doing that day.

Screenshot of results:

```
MariaDB [UP877962db]> select * from DeliveryCollection
    -> where delColl_Date = "2018-04-03"
    -> and delColl_staff_ID = 2;
+------------+--------------+-------------------+-----------------+
| delColl_ID | delColl_Date | delColl_veh_RegNo | delColl_staff_ID |
+------------+--------------+-------------------+-----------------+
|          2 | 2018-04-03   | AB16 TRW          |               2 |
+------------+--------------+-------------------+-----------------+
1 row in set (0.00 sec)

MariaDB [UP877962db]>
```

Query 2

Query Description and why it's of use to JM:

This query brings up the current publications in order and the outlet ID's of the outlets ordering them, as well as the total amount of publications and the date and time they were ordered. This is of use to keep a check on what is being ordered by who and when.

Screenshot of results:

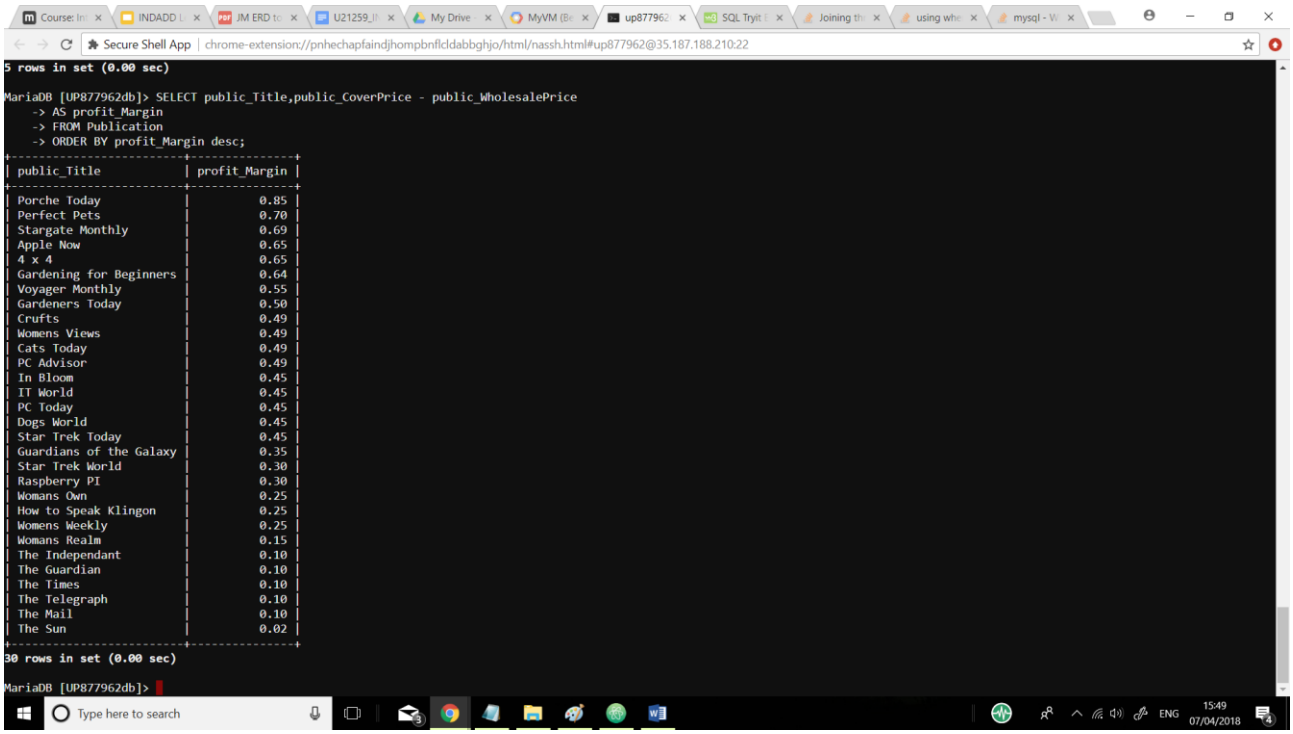
```
MariaDB [UP877962db]> SELECT PublicationInOrder.pubInOrd_Qty, OutletOrder.outOrd_outlet_ID,  PublicationInOrder.pubOrd_public_ID, PublicationInOrder.pubInOrder_DateTime
    -> FROM  PublicationInOrder
    -> INNER JOIN  OutletOrder
    -> ON PublicationInOrder.pubOrd_public_ID=OutletOrder.outOrd_outlet_ID;
+--------------+-----------------+-----------------+---------------------+
| pubInOrd_Qty | outOrd_outlet_ID | pubOrd_public_ID | pubInOrder_DateTime |
+--------------+-----------------+-----------------+---------------------+
|         2000 |               7 |               7 | 2018-03-29 14:26:02 |
|         2000 |              16 |              16 | 2018-04-01 11:46:09 |
|         5000 |               1 |               1 | 2018-04-02 14:30:18 |
|          200 |              26 |              26 | 2018-04-04 14:30:17 |
|          400 |              12 |              12 | 2018-04-05 11:45:33 |
+--------------+-----------------+-----------------+---------------------+
5 rows in set (0.02 sec)

MariaDB [UP877962db]>
```

Query 3

Query Description and why it's of use to JM:

This query brings up the profit margins for the publications in the database. This could be used to renegotiate prices where necessary or to get rid of publications if they are not very profitable and not selling well.

Screenshot of results:

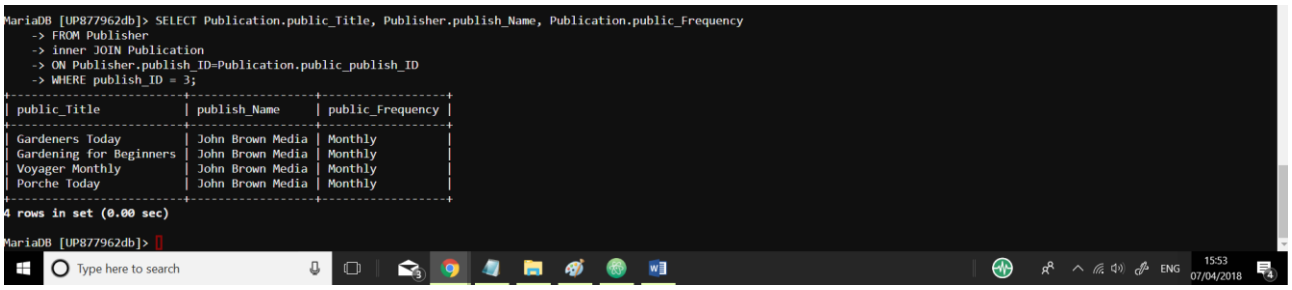


Query 4

Query Description and why it's of use to JM:

This query displays the publications a publisher produces and the frequency that they publish them. This is useful to look at the titles a publisher publishes.

Screenshot of results:

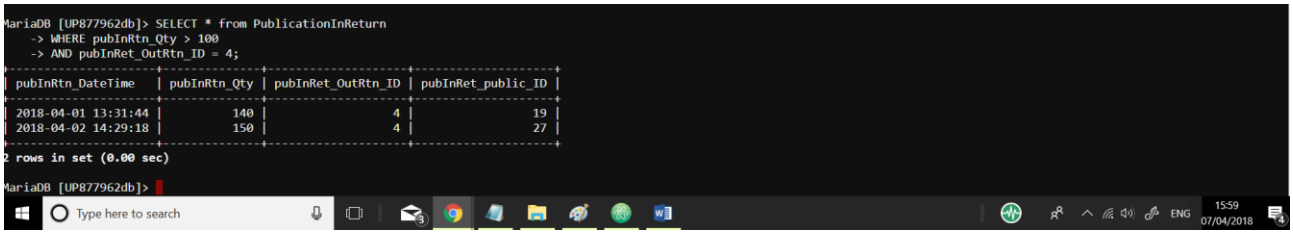


Query 5

Query Description and why it's of use to JM:

This query displays the amount of publications in return that are over 100 for a certain Outlet in this case outlet 4 as well as the time and dates of the returns. This is useful to check if an outlet is potentially overordering on a regular basis.

Screenshot of results:



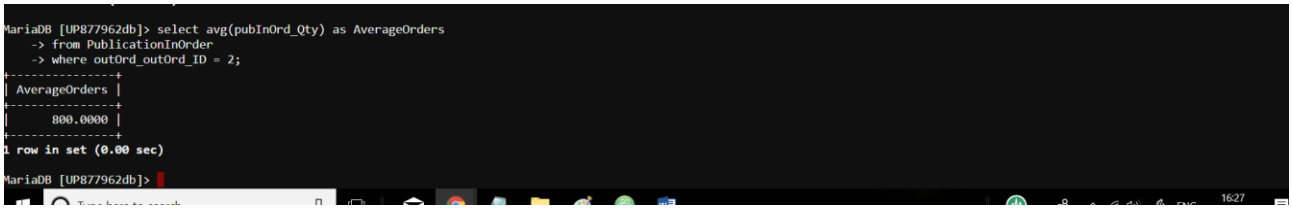
Task 3c: SQL Queries using Aggregate Function

Query 1

Query Description and why it's of use to JM:

This query lets you look at the average amount of publications an outlet orders. This could be useful for working out how roughly how many publications an outlet may be taking at a time.

Screenshot of results:



Query 2

Query Description and why it's of use to JM:

This query lists the total number of publications for each publisher. This is useful to know when negotiating contracts.

Screenshot of results:

Query 3

Query Description and why it's of use to JM:

This query displays the total number of a publication that is currently on order. This is useful for stock management etc.

Screenshot of results:

Query 4

Query Description and why it's of use to JM:

This query displays the minimum and maximum vehicle capacities in the fleet. This is useful for logistical reasons.

Screenshot of results:

Query 5

Query Description and why it's of use to JM:

This query lets you look at the amount of restock orders that are placed on a given date. This could be useful for order management and auditing purposes.

Screenshot of results: