Student Name	Lin Rui
Maynooth ID	21124264

Student Name	林锐
FZU ID	832103316

CS130 Databases

Lab 11 Report

PART 2

Lab 11 Question 1: Write an SQL statement to list the details of ALL crimes of type 'Shoplifting' which occured where the location column includes the word 'petrol station'. You are asked to specify the number of rows returned.

☆ ***SQL Language:***

```
SELECT * FROM cs130crime
WHERE crime = 'Shoplifting'
AND location ~* '.*petrol station.*'
```

☆ ***Running result:*** *102 rows affected*

Query Editor | Query History

```
1  SELECT * FROM cs130crime
2  WHERE crime = 'Shoplifting'
3  AND location ~* '.*petrol station.*'
```

Messages

```
Successfully run. Total query runtime: 98 msec.
102 rows affected.
```

Data Output | Explain | Notifications

	crimeid text	latitude real	longitude real	location text	lsoa character varying (1	lsoaname text	crime text	outcome text	context text	recordtime timestamp without time zone
1	fde74e9f5b47...	52.4584	-1.95263	On or near Petrol Station	E01009068	Birmingham...	Shoplifting	Awaiting c...	[null]	2017-10-07 08:28:00
2	f6eb1eeb8dad...	52.5021	-1.79808	On or near Petrol Station	E01009083	Birmingham...	Shoplifting	Investigati...	no suspe...	2017-10-22 19:25:00
3	f0e89217b760...	52.4406	-1.97915	On or near Petrol Station	E01008924	Birmingham...	Shoplifting	Unable to ...	[null]	2017-10-17 00:16:00
4	f02bc80572d4...	52.5522	-1.9102	On or near Petrol Station	E01009223	Birmingham...	Shoplifting	Under inve...	[null]	2017-10-21 11:15:00
5	eb9cde3561f5...	52.6088	-1.9952	On or near Petrol Station	E01010282	Walsall 012A	Shoplifting	Investigati...	no suspe...	2017-10-12 08:27:00

Lab 11 Question 2: Write an SQL statement to find the name (lsoaname) of the Lower Layer Super Output Area (LSOA) in which the highest number of crimes have been recorded by the West Midlands Police Force. You are asked to state the name of this LSOA. Alternatively, you can provide the LSOA code.

☆ ***SQL Language:***

```
SELECT lsoaname, COUNT(crime) FROM cs130crime
GROUP BY lsoaname
ORDER BY COUNT(crime) DESC
```

☆ ***Running result:*** *1684 rows affected*

☆ ***Answer:*** *Birmingham 138A*

Query Editor | Query History

```
1  SELECT lsoaname, COUNT(crime) FROM cs130crime
2  GROUP BY lsoaname
3  ORDER BY COUNT(crime) DESC
```

Data Output | Explain | Notifications

Messages

```
Successfully run. Total query runtime: 67 msec.
1684 rows affected.
```

	lsoaname text	count bigint
1	Birmingham 138A	268
2	Wolverhampton 020F	201
3	Coventry 031C	181
4	Birmingham 135C	178
5	Walsall 030A	132

Lab 11 Question 3: Write an SQL statement to find the name of the crime which is the 6th most frequently recorded in this dataset during October 2017. You are asked to state the name of this crime.

☆ ***SQL Language:***

SELECT crime, COUNT(crime) FROM cs130crime
GROUP BY crime
ORDER BY COUNT(crime) DESC

☆ ***Running result:*** *13 rows affected*

☆ ***Answer:*** *Shoplifting*

Query Editor | Query History

```
1  SELECT crime, COUNT(crime) FROM cs130crime
2  GROUP BY crime
3  ORDER BY COUNT(crime) DESC
```

Data Output | Explain | Notifications

	crime text	count bigint
1	Violence and ...	4990
2	Vehicle crime	3207
3	Burglary	2234
4	Criminal dam...	2115
5	Other theft	1964
6	Shoplifting	1602
7	Public order	877
8	Robbery	571
9	Drugs	305
10	Other crime	293
11	Bicycle theft	245
12	Theft from th...	235
13	Possession o...	138

Messages

```
Successfully run. Total query runtime: 47 msec.
13 rows affected.
```

Lab 11 Question 4: Write an SQL statement to find the number of LSOA, where the LSOA name contains Birmingham, which have 5 or less crimes reported during the month of October 2017. You are asked to specify the number of rows returned.

☆ ***SQL Language:***

SELECT lsoaname,count(crime) FROM cs130crime
*WHERE lsoaname ~ '.*Birmingham.*'*
GROUP BY lsoaname
HAVING COUNT(crime)<=5

☆ ***Running result:*** *166 rows affected*

Query Editor | Query History

```
1  SELECT lsoaname,count(crime) FROM cs130crime
2  WHERE lsoaname ~ '.*Birmingham.*'
3  GROUP BY lsoaname
4  HAVING COUNT(crime)<=5
```

Data Output | Explain | Notifications

	lsoaname text	count bigint
1	Birmingham...	5
2	Birmingham...	4
3	Birmingham...	5
4	Birmingham...	4
5	Birmingham...	2

Messages

```
Successfully run. Total query runtime: 89 msec.
166 rows affected.
```

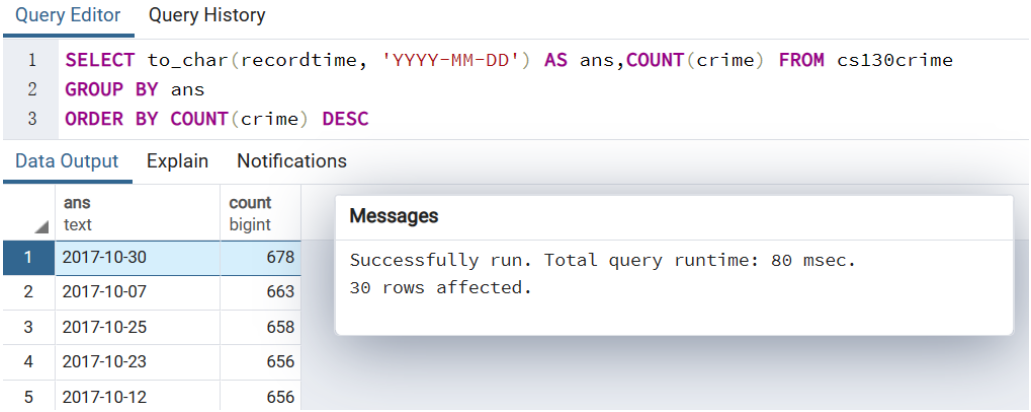
Lab 11 Question 5: Write an SQL statement to find which DAY in October 2017 had the most number of crimes recorded. You are required to state the date in YYYY MM DD format in the Moodle Quiz.

☆ ***SQL Language:***

SELECT to_char(recordtime, 'YYYY-MM-DD') AS ans,COUNT(crime) FROM cs130crime
GROUP BY ans
ORDER BY COUNT(crime) DESC

☆ ***Running result:*** *30 rows affected*

☆ ***Answer:*** *2017-10-30*



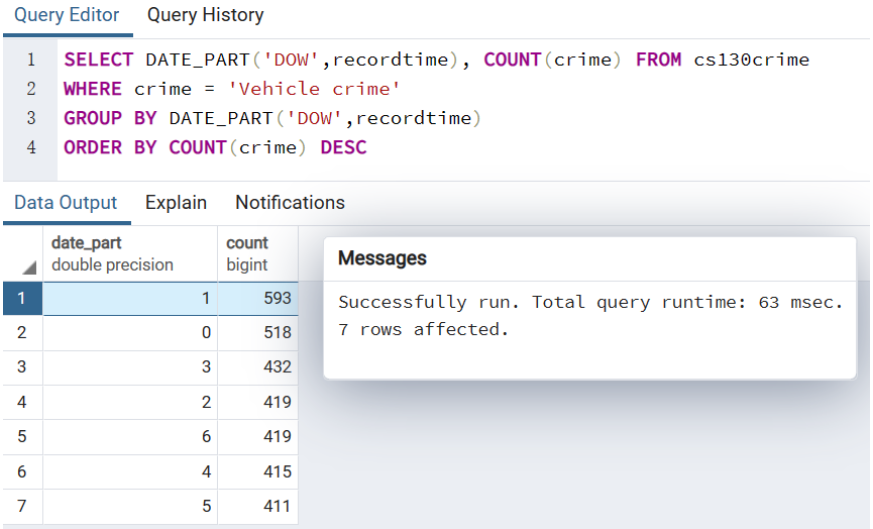
Lab 11 Question 6: Write an SQL statement to find which DAY OF THE WEEK in October 2017 had the most number of 'Vehicle crime' crimes recorded. You are asked to state the NAME of the day of the week with the most number of 'Vehicle crime' crimes recorded in October 2017.

☆ ***SQL Language:***

SELECT DATE_PART('DOW',recordtime), COUNT(crime) FROM cs130crime
WHERE crime = 'Vehicle crime'
GROUP BY DATE_PART('DOW',recordtime)
ORDER BY COUNT(crime) DESC

☆ ***Running result:*** *7 rows affected*

☆ ***Answer:*** *Monday*



Lab 11 Question 7: The West Midlands Police are interested in the rate of crime recording between the 20th of October 2017 and the 27th of October 2017 (inclusive). Write an SQL statement to find the number of distinct

crime types (such as Burglarly, public order, etc) reporting during this period. You should only return a crime type (crime column) if that crime has been reported more than 100 times during this specific period. You are asked to specify the number of crime types which are reporting during this period with over 100 occurrences.

☆ ***SQL Language:***

```
SELECT crime,COUNT(crime) FROM cs130crime
WHERE DATE_PART('DAY',recordtime) BETWEEN 20 AND 27
GROUP BY crime
HAVING COUNT(crime)>100
```

☆ ***Running result:*** *8 rows affected*

Query Editor | Query History

```
1  SELECT crime,COUNT(crime) FROM cs130crime
2  WHERE DATE_PART('DAY',recordtime) BETWEEN 20 AND 27
3  GROUP BY crime
4  HAVING COUNT(crime)>100
```

Data Output | Explain | Notifications

	crime text	count bigint
1	Burglary	623
2	Criminal damage ...	567
3	Other theft	526
4	Public order	222
5	Robbery	161
6	Shoplifting	415
7	Vehicle crime	858
8	Violence and sex...	1323

Messages

Successfully run. Total query runtime: 75 msec.
8 rows affected.

Lab 11 Question 8: Use a SQL SUB QUERY to solve the following problem. List all of the details of all crimes in the West Midlands database which are the same as the crimes that have been recorded in the LSOA called Nuneaton and Bedworth 018E. Your output sh ould NOT include the details of the crimes reported in Nuneaton and Bedworth 018E. You are asked to specify the number of rows returned.

☆ ***SQL Language:***

```
SELECT * FROM cs130crime
WHERE crime IN (
    SELECT crime FROM cs130crime
    WHERE lsoaname IN ('Nuneaton and Bedworth 018E'))
AND lsoaname NOT IN ('Nuneaton and Bedworth 018E')
```

☆ ***Running result:*** *2683 rows affected*

Query Editor | Query History

```
1  SELECT * FROM cs130crime
2  WHERE crime IN (
3      SELECT crime FROM cs130crime
4      WHERE lsoaname IN ('Nuneaton and Bedworth 018E'))
5  AND lsoaname NOT IN ('Nuneaton and Bedworth 018E')
```

Messages

Successfully run. Total query runtime: 134 msec.
2683 rows affected.

Data Output | Explain | Notifications

	crimeid text	latitude real	longitude real	location text	lsoa character varying (15)	lsoaname text	crime text	outcome text	context text	recordtime timestamp without time zone
1	fff946e7...	52.4321	-1.52319	On or nea...	E01009623	Coventry 01...	Robbery	Under inve...	[null]	2017-10-15 06:48:00
2	ffef769b...	52.653	-1.92535	On or nea...	E01010305	Walsall 002C	Robbery	Unable to ...	[null]	2017-10-23 20:46:00
3	ffe6ef08...	52.4072	-2.01138	On or nea...	E01009157	Birmingham...	Criminal d...	Unable to ...	[null]	2017-10-06 18:40:00
4	ff921379...	52.5178	-1.95031	On or nea...	E01009272	Birmingham...	Robbery	Investigati...	no su...	2017-10-24 02:55:00
5	ff788d01...	52.4742	-1.89584	On or nea...	E01033615	Birmingham...	Robbery	Awaiting c...	[null]	2017-10-14 15:35:00

PART 3

***Lab 11 Question 9:** Write an SQL query which will find the closest 10 crimes reported to the following point (Latitude,Longitude) = (52.509070, 52.509070,–1.884850) which is the location of Villa Park, home of Aston Villa Football Club.*

☆ ***SQL Language:***

```
SELECT *,POWER(latitude–52.509070,2)+POWER(longitude–(–1.88485),2) AS distance
FROM cs130crime
ORDER BY distance
LIMIT 10
```

☆ ***Running result:*** *10 rows affected*

Query Editor | Query History

```
1  SELECT *,POWER(latitude-52.509070,2)+POWER(longitude-(-1.88485),2) AS distance
2  FROM cs130crime
3  ORDER BY distance
4  LIMIT 10
```

Messages

```
Successfully run. Total query runtime: 62 msec.
10 rows affected.
```

Data Output | Explain | Notifications

	crimeid text	latitude real	longitude real	location text	lsoa character varying (	lsoaname text	crime text	outcome text	context text	recordtime timestamp without time zone	distance double precision
1	20deabe...	52.5104	-1.88415	On or nea...	E01008916	Birmingham...	Vehicle...	Investigati...	no suspe...	2017-10-30 06:31:00	.19262029530285e-06
2	8e2a535...	52.5088	-1.88321	On or nea...	E01008916	Birmingham...	Shoplif...	Under inve...	[null]	2017-10-10 11:14:00	.76165080477965e-06
3	b248b9ef...	52.511	-1.88395	On or nea...	E01008916	Birmingham...	Violenc...	Under inve...	[null]	2017-10-05 06:57:00	.36264662769326e-06
4	5e26a47...	52.5088	-1.88198	On or nea...	E01008916	Birmingham...	Burglary	Investigati...	no suspe...	2017-10-23 14:07:00	.29837540985595e-06
5	ebddc1e...	52.512	-1.88617	On or nea...	E01008916	Birmingham...	Violenc...	Under inve...	[null]	2017-10-16 05:27:00	.01437811971656e-05
6	6870a32...	52.512	-1.88617	On or nea...	E01008916	Birmingham...	Violenc...	Action to b...	[null]	2017-10-15 04:11:00	.01437811971656e-05
7	42c2fe62...	52.512	-1.88617	On or nea...	E01008916	Birmingham...	Other t...	Under inve...	[null]	2017-10-20 20:12:00	.01437811971656e-05
8	cc174f55...	52.5123	-1.88576	On or nea...	E01009053	Birmingham...	Violenc...	Investigati...	no suspe...	2017-10-02 01:36:00	.13030391527519e-05
9	d62a78e...	52.5123	-1.88576	On or nea...	E01009053	Birmingham...	Other t...	Investigati...	no suspe...	2017-10-22 01:28:00	.13030391527519e-05
10	946a2e7...	52.5123	-1.88576	On or nea...	E01009053	Birmingham...	Violenc...	Under inve...	[null]	2017-10-18 13:31:00	.13030391527519e-05

***Lab 11 Question 10:** Write an SQL query which returns all of the details of the crimes which have latitude/longitude coordinates INSIDE this bounding rectangle as shown below. This bounding rectangle encloses the approximate city–center area in Birmingham.*

☆ ***SQL Language:***

```
SELECT * FROM cs130crime
WHERE (latitude BETWEEN 52.4742 AND 52.4807)
AND (longitude BETWEEN –1.9044 AND –1.8895)
```

☆ ***Running result:*** *418 rows affected*

Query Editor | Query History

```
1  SELECT * FROM cs130crime
2  WHERE (latitude BETWEEN 52.4742 AND 52.4807)
3  AND (longitude BETWEEN -1.9044 AND -1.8895)
```

Messages

```
Successfully run. Total query runtime: 64 msec.
418 rows affected.
```

Data Output | Explain | Notifications

	crimeid text	latitude real	longitude real	location text	lsoa character varying (1	lsoaname text	crime text	outcome text	context text	recordtime timestamp without time
1	ff84867...	52.4779	-1.89362	On or near ...	E01033561	Birmingha...	Shoplifting	Investigati...	no suspe...	2017-10-13 11:35:00
2	ff788d0...	52.4742	-1.89584	On or near ...	E01033615	Birmingha...	Robbery	Awaiting c...	[null]	2017-10-14 15:35:00
3	ff5ab6ff...	52.4771	-1.89249	On or near ...	E01033561	Birmingha...	Public order	Offender gi...	[null]	2017-10-05 03:04:00
4	ff03e6e...	52.4802	-1.89609	On or near ...	E01033620	Birmingha...	Other theft	Investigati...	no suspe...	2017-10-26 01:48:00
5	fe926f2...	52.4787	-1.90059	On or near ...	E01033620	Birmingha...	Shoplifting	Investigati...	no suspe...	2017-10-04 08:11:00