Order of True SQL statements

- Defines the order in which the SQL clauses are evaluated during query

- Good understanding of SQL query order helps with debugging and query optimisation

order	sql clause	function
1	FROM	Specifies the table to extract and/or join
2	WHERE	Filters the query data
3	GROUP BY	Aggregates the query data by field chosen
4	HAVING	Filters Aggregated data
5	SELECT	Specifies which columns to return
6	ORDER BY	Sort the data by requested column
7	LIMIT	Limits the result data returned

Order of True SQL statements

- As an Analytics Engineer, I want to understand more about number of our customers who lives in England. It should be aggregated at city level so that I can understand which city has most of our customers.
- Due to large data volume, I only want to see top 10 cities with most number of customers

```
5  SELECT  city, COUNT(*) as count_of_customers
1  FROM sql_primer.customer
2  WHERE state_province='ENG'
3  GROUP BY city
4  HAVING count_of_customers>10
6  ORDER BY count_of_customers DESC
7  LIMIT 10;
```

Step 1: Retrieving Data (FROM)

```
FROM sql_primer.customer
```

Row	id	first_name	last_name	email	address	city	state_province	job_title	home_phone
1	33	Chadwick	Woodyear	cwoodyearw@instagram.com	357 Forest Run Crossing	Glasgow	SCT	Quality Engineer	579-268-1543
2	468	Frederigo	Aikenhead	faikenheadcz@exblog.jp	246 Mosinee Lane	Glasgow	SCT	Analog Circuit Design manager	223-115-1654
3	591	Roscoe	Jorger	rjorgerge@hibu.com	7 South Trail	Glasgow	SCT	Financial Analyst	494-545-8400
4	605	Reinaldos	McGettigan	rmcgettigangs@ft.com	4123 Harbort Lane	Glasgow	SCT	Legal Assistant	312-798-3248
5	755	Ronnie	Lipscomb	rlipscombky@baidu.com	9 Kennedy Circle	Glasgow	SCT	Staff Accountant IV	706-291-9761
6	857	Tait	Ashness	tashnessns@paypal.com	15768 Rieder Parkway	Glasgow	SCT	Web Designer II	757-566-6966
7	932	Ailbert	Fulop	afuloppv@ca.gov	35 Mandrake Alley	Glasgow	SCT	Marketing Manager	866-362-8869
8	65	Thom	Ornells	tornells1s@canalblog.com	2 Amoth Circle	Church End	ENG	Associate Professor	641-158-5127
9	129	Solomon	McGann	smcgann3k@barnesandnoble...	674 Truax Street	Church End	ENG	Civil Engineer	204-392-9518
10	151	Oren	Jeune	ojeune46@ucoz.com	5648 1st Park	Church End	ENG	VP Accounting	383-996-6646
11	316	Renato	Ruckledge	rruckledge8r@list-manage.com	5372 Burrows Point	Church End	ENG	Internal Auditor	591-950-9254
12	463	Nathan	Mobley	nmobleycu@nyu.edu	340 Lighthouse Bay Avenue	Church End	ENG	Account Executive	978-473-6435
13	667	Alastair	Pottes	apottesii@clickbank.net	10854 3rd Trail	Church End	ENG	Marketing Manager	720-946-1402
14	949	Jozef	Kull	jkullqc@a8.net	8689 Granby Road	Church End	ENG	Business Systems Developmen...	865-852-3311
15	144	Jerrie	Cantos	jcantos3z@unblog.fr	159 Scoville Park	Sheffield	ENG	Account Coordinator	458-885-8321
16	265	Perceval	Batter	pbatter7c@china.com.cn	60277 Northwestern Way	Sheffield	ENG	Quality Engineer	836-677-0113
17	274	Raphael	Clarson	rclarson7l@bluehost.com	4056 Hovde Alley	Sheffield	ENG	Account Coordinator	950-848-9086
18	576	Godard	Arstingall	garstingallfz@cargocollective...	27875 Fremont Park	Sheffield	ENG	Technical Writer	399-889-0699
19	787	Antons	Josh	ajoshlu@sciencedirect.com	82570 Loftsgordon Hill	Sheffield	ENG	Administrative Officer	663-208-6657
20	125	Nicolas	Brittan	nbrittan3o@mozilla.com	50 Garrison Road	Norton	ENG	Data Coordinator	805-154-9814

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* Note: if we have joins in our SQL statement, the execution of the statements will be From clause then followed by the Join clause as Step 1

Step 2: Filter Data (WHERE)

```
FROM sql_primer.customer
WHERE state_province='ENG'
```

Row	id	first_name	last_name	email	address	city	state_province	job_title	home_phone
1	65	Thom	Ornells	tornells1s@canalblog.com	2 Amoth Circle	Church End	ENG	Associate Professor	641-158-5127
2	129	Solomon	McGann	smcgann3k@barnesandnoble...	674 Truax Street	Church End	ENG	Civil Engineer	204-392-9518
3	151	Oren	Jeune	ojeune46@ucoz.com	5648 1st Park	Church End	ENG	VP Accounting	383-996-6646
4	316	Renato	Ruckledge	rruckledge8r@list-manage.com	5372 Burrows Point	Church End	ENG	Internal Auditor	591-950-9249
5	463	Nathan	Mobley	nmobleycu@nyu.edu	340 Lighthouse Bay Avenue	Church End	ENG	Account Executive	978-473-6435
6	667	Alastair	Pottes	apottesii@clickbank.net	10854 3rd Trail	Church End	ENG	Marketing Manager	720-946-1402
7	949	Jozef	Kull	jkullqc@a8.net	8689 Granby Road	Church End	ENG	Business Systems Developmen...	865-852-3311
8	144	Jerrie	Cantos	jcantos3z@unblog.fr	159 Scoville Park	Sheffield	ENG	Account Coordinator	458-885-8321
9	265	Perceval	Batter	pbatter7c@china.com.cn	60277 Northwestern Way	Sheffield	ENG	Quality Engineer	836-677-0113
10	274	Raphael	Clarson	rclarson7l@bluehost.com	4056 Hovde Alley	Sheffield	ENG	Account Coordinator	950-848-9086
11	576	Godard	Arstingall	garstingallfz@cargocollective...	27875 Fremont Park	Sheffield	ENG	Technical Writer	399-889-0699
12	787	Antons	Josh	ajoshlu@sciencedirect.com	82570 Loftsgordon Hill	Sheffield	ENG	Administrative Officer	663-208-6657
13	125	Nicolas	Brittan	nbrittan3g@mozilla.com	50 Garrison Road	Norton	ENG	Data Coordinator	805-154-9814
14	141	Madison	Camerana	mcamerana3w@barnesandnob...	5693 Haas Road	Norton	ENG	Chief Design Engineer	744-781-1086
15	420	Devy	McLewd	dmclewdbn@smh.com.au	88376 Lakewood Gardens Alley	Norton	ENG	Human Resources Manager	958-338-4393
16	516	Hendrik	Meegan	hmeeganeb@wiley.com	9 Badeau Alley	Norton	ENG	Senior Cost Accountant	116-523-5434
17	753	Early	Chad	echadkw@webs.com	1 Bluestem Hill	Norton	ENG	Clinical Specialist	901-213-5946
18	920	Cornelius	Dowsey	cdowseypj@bloomberg.com	8 Stuart Lane	Norton	ENG	Analyst Programmer	879-895-2331
19	957	Nilson	Minthorpe	nminthorpeqk@fotki.com	2 Manitowish Junction	Norton	ENG	Administrative Officer	880-138-7853
20	174	Fremont	Sherwyn	fsherwyn4t@scribd.com	41036 Graedel Place	Birmingham	ENG	Director of Sales	162-828-5579

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Step 3: Group Data (GROUP BY)

```
FROM sql_primer.customer
WHERE state_province='ENG'
GROUP BY city
```

Row	city
1	Glasgow
2	Church End
3	Sheffield
4	Norton
5	Birmingham
6	Bradford
7	Belfast
8	Carlton
9	Edinburgh
10	Newton
11	Liverpool
12	Stapleford
13	Leeds
14	Halton
15	Manchester
16	Denton
17	Wootton

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Step 3: Group Data (GROUP BY)


```
1
2  SELECT city,state_province
3  FROM sql_primer.customer
4  WHERE state_province='ENG'
5  GROUP BY city
6
```

Query results

JOB INFORMATION   RESULTS   EXECUTION DETAILS

SELECT list expression references column id which is neither grouped nor aggregated at [2:8]

Step 4: Filter Group Data (HAVING)

```
FROM sql_primer.customer
WHERE state_province='ENG'
GROUP BY city
HAVING count(*)>10
```

Row	city	count_of_cit...	
1	Church End	11	
2	Sheffield	13	
3	Norton	14	
4	Birmingham	14	
5	Carlton	12	
6	Newton	12	
7	Liverpool	13	
8	London	30	
9	Milton	16	
10	Ford	13	
11	Twyford	11	
12	Normanton	11	

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* Note: if we have windows functions in our SQL statement, it'll be calculated after this step.

Step 5: Select Returned Results (SELECT)

```sql
SELECT  city, COUNT(*) as count_of_customers_cities
FROM sql_primer.customer
WHERE state_province='ENG'
GROUP BY city
HAVING COUNT(*)>10;
```

Row	city	count_of_customers
1	Church End	11
2	Sheffield	13
3	Norton	14
4	Birmingham	14
5	Carlton	12
6	Newton	12
7	Liverpool	13
8	London	30
9	Milton	16
10	Ford	13
11	Twyford	11
12	Normanton	11

Results per page: 50 ▼   1 – 12 of 12 |<

Step 6: Order Results (ORDER BY)

```sql
SELECT  city, COUNT(*) as count_of_customers_cities
FROM sql_primer.customer
WHERE state_province='ENG'
GROUP BY city
HAVING COUNT(*)>10
ORDER BY count_of_customers_cities DESC;
```

Row	city	count_of_customers
1	London	30
2	Milton	16
3	Norton	14
4	Birmingham	14
5	Sheffield	13
6	Liverpool	13
7	Ford	13
8	Carlton	12
9	Newton	12
10	Church End	11
11	Twyford	11
12	Normanton	11

Results per page: 50 ▼   1 – 12 of 12 |<

Step 7: Limit the Results (LIMIT)

```sql
SELECT  city, COUNT(*) as count_of_customers_cities
FROM sql_primer.customer
WHERE state_province='ENG'
GROUP BY city
HAVING COUNT(*)>10
ORDER BY count_of_customers_cities DESC
LIMIT 10;
```

Row	city	count_of_customers
1	London	30
2	Milton	16
3	Birmingham	14
4	Norton	14
5	Sheffield	13
6	Ford	13
7	Liverpool	13
8	Carlton	12
9	Newton	12
10	Church End	11