

# Statistical Analysis System: Class 19

Dated: 05/05/2018

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## SQL revised:

<b>/*Prog 1*/</b>	<b>Output</b>																		
<pre>proc sql; select * from sasuser.admit where age=max(age); quit;</pre>	<pre>42 proc sql; 43 select * from sasuser.admit where age=max(age); ERROR: Summary functions are restricted to the SELECT and HAVING clauses only. 44 quit; NOTE: The SAS System stopped processing this step because of errors. NOTE: PROCEDURE SQL used (Total process time):       real time           0.01 seconds       cpu time             0.01 seconds</pre>																		
<b>/*Prog 2*/</b> <b>Using Sub Query</b>	<b>Output</b>																		
<pre>proc sql; select * from sasuser.admit where age=(select max(age) from sasuser.admit); quit;</pre>	<div>The SAS System16:28 Friday, May 8, 2009</div> <table><tr><th>ID</th><th>Name</th><th>Sex</th><th>Age</th><th>Date</th><th>Height</th><th>Weight</th><th>Act Level</th><th>Fee</th></tr><tr><td>2579</td><td>Underwood, K</td><td>M</td><td>60</td><td>22</td><td>71</td><td>191</td><td>LOW</td><td>149.75</td></tr></table> <p><b>Explained:</b> results in the observation with maximum age from S.A table</p>	ID	Name	Sex	Age	Date	Height	Weight	Act Level	Fee	2579	Underwood, K	M	60	22	71	191	LOW	149.75
ID	Name	Sex	Age	Date	Height	Weight	Act Level	Fee											
2579	Underwood, K	M	60	22	71	191	LOW	149.75											

<b>/*Prog 3*/ Using Sub Query</b>	<b>Output</b>						
<pre>data enet; input id; cards; 1 2 ; run;  data IBM; input id sal; cards; 1 100 2 200 3 300 ; run;  proc sql; select * from IBM where id in(select id from enet); quit;</pre>	<p>The SAS System 16:28 Friday, May 8,</p> <table> <tr> <th>id</th><th>sal</th></tr> <tr> <td>1</td><td>100</td></tr> <tr> <td>2</td><td>200</td></tr> </table> <p><b>Explained:</b> results with values for “ID” common to both IBM and enet</p>	id	sal	1	100	2	200
id	sal						
1	100						
2	200						
<pre>proc sql; select * from IBM where id not in(select id from enet); quit;</pre>	<p>The SAS System 16:28 Friday, May 8,</p> <table> <tr> <th>id</th><th>sal</th></tr> <tr> <td>3</td><td>300</td></tr> </table> <p><b>Explained:</b> results with values for “ID” only in “IBM” and not in “enet.</p>	id	sal	3	300		
id	sal						
3	300						

/*Prog 4*/ Using Sub Query	Output								
<pre> data enet; input id; cards; 1 2 ; run;  data IBM; input id sal; cards; 1 100 2 200 3 300 ; run;  data abs; input id; cards; 2 ; run;  proc sql; select * from IBM where id in(select id from enet) and id in (select id from abs);  select * from IBM where id in ( select id from enet where id not in (select id from abs));  quit; </pre>	<div data-bbox="646 293 1310 434"> <p>The SAS System 16:28 Friday,</p> <table> <thead> <tr> <th>id</th><th>sal</th></tr> </thead> <tbody> <tr> <td>2</td><td>200</td></tr> </tbody> </table> </div> <p><b>Explained:</b> results with values for “ID” common to both “abs” and “enet”</p> <div data-bbox="646 1205 1396 1346"> <p>The SAS System 16:28 Friday, May 8,</p> <table> <thead> <tr> <th>id</th><th>sal</th></tr> </thead> <tbody> <tr> <td>1</td><td>100</td></tr> </tbody> </table> </div> <p><b>Explained:</b> results with values for “ID” present only in “enet” and not in “abs”</p>	id	sal	2	200	id	sal	1	100
id	sal								
2	200								
id	sal								
1	100								

/*Prog 5*/ Using Sub Query	Output
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```

data enet;
input id;
cards;
1
2
3
;
run;

data IBM;
input id sal;
cards;
1 100
2 200
3 300
4 400
;
run;

data abs;
input id;
cards;
2
;
run;

data hr;
input id;
cards;
1
3
;
run;

proc sql;
select * from IBM where id in
( select id from enet ) and id not
in (select id from abs) and id in
(select id from hr);
quit;

```

The SAS System

16:28 Friday, Ma

id	sal
1	100
3	300

/\*

Base SAS equivalent logic:

```

merge enet (in=x) IBM (in=y) abs
(in=k) hr (in=z);
if x and y and not k and z;

```

\*/

**Explained:** results with values for “ID” present in “enet” and “hr” but not in “abs”

/\*Prog 6\*/ Using Sub Query, Case

Output

<pre>data a; input age; cards; 40 99 60 ; run;</pre>	<div><div>The SAS System16:28 Friday, May 8, 200918</div><table><tr><th>ID</th><th>Name</th><th>Sex</th><th>Age</th><th>Date</th><th>Height</th><th>Weight</th><th>Act Level</th><th>Fee</th><th>flag</th></tr><tr><td>2458</td><td>Murray, W</td><td>M</td><td>27</td><td>1</td><td>72</td><td>168</td><td>HIGH</td><td>85.20</td><td>0</td></tr><tr><td>2462</td><td>Almers, C</td><td>F</td><td>34</td><td>3</td><td>66</td><td>152</td><td>HIGH</td><td>124.80</td><td>0</td></tr><tr><td>2501</td><td>Bonaventure, T</td><td>F</td><td>31</td><td>17</td><td>61</td><td>123</td><td>LOW</td><td>149.75</td><td>0</td></tr><tr><td>2523</td><td>Johnson, R</td><td>F</td><td>43</td><td>31</td><td>63</td><td>137</td><td>MOD</td><td>149.75</td><td>0</td></tr><tr><td>2539</td><td>LaMance, K</td><td>M</td><td>51</td><td>4</td><td>71</td><td>158</td><td>LOW</td><td>124.80</td><td>0</td></tr><tr><td>2544</td><td>Jones, M</td><td>M</td><td>29</td><td>6</td><td>76</td><td>193</td><td>HIGH</td><td>124.80</td><td>0</td></tr><tr><td>2552</td><td>Reberson, P</td><td>F</td><td>32</td><td>9</td><td>67</td><td>151</td><td>MOD</td><td>149.75</td><td>0</td></tr><tr><td>2555</td><td>King, E</td><td>M</td><td>35</td><td>13</td><td>70</td><td>173</td><td>MOD</td><td>149.75</td><td>0</td></tr><tr><td>2563</td><td>Pitts, D</td><td>M</td><td>34</td><td>22</td><td>73</td><td>154</td><td>LOW</td><td>124.80</td><td>0</td></tr><tr><td>2568</td><td>Eberhardt, S</td><td>F</td><td>49</td><td>27</td><td>64</td><td>172</td><td>LOW</td><td>124.80</td><td>0</td></tr><tr><td>2571</td><td>Nunnelly, A</td><td>F</td><td>44</td><td>19</td><td>66</td><td>140</td><td>HIGH</td><td>149.75</td><td>0</td></tr><tr><td>2572</td><td>Oberon, M</td><td>F</td><td>28</td><td>17</td><td>62</td><td>118</td><td>LOW</td><td>85.20</td><td>0</td></tr><tr><td>2574</td><td>Peterson, V</td><td>M</td><td>30</td><td>6</td><td>69</td><td>147</td><td>LOW</td><td>149.75</td><td>0</td></tr><tr><td>2575</td><td>Quigley, M</td><td>F</td><td>40</td><td>8</td><td>69</td><td>163</td><td>HIGH</td><td>124.80</td><td>1</td></tr><tr><td>2578</td><td>Cameron, L</td><td>M</td><td>47</td><td>5</td><td>72</td><td>173</td><td>NA</td><td>124.80</td><td>0</td></tr><tr><td>2579</td><td>Underwood, K</td><td>M</td><td>60</td><td>22</td><td>71</td><td>191</td><td>LOW</td><td>149.75</td><td>1</td></tr><tr><td>2584</td><td>Takahashi, Y</td><td>F</td><td>43</td><td>29</td><td>65</td><td>123</td><td>MODY</td><td>124.80</td><td>0</td></tr><tr><td>2586</td><td>Derber, B</td><td>M</td><td>25</td><td>23</td><td>75</td><td>188</td><td>HIGH</td><td>85.20</td><td>0</td></tr><tr><td>2588</td><td>Ivan, H</td><td>F</td><td>22</td><td>20</td><td>63</td><td>139</td><td>LOW</td><td>85.20</td><td>0</td></tr><tr><td>2589</td><td>Wilcox, E</td><td>F</td><td>41</td><td>16</td><td>67</td><td>141</td><td>HIGH</td><td>149.75</td><td>0</td></tr><tr><td>2595</td><td>Warren, C</td><td>M</td><td>54</td><td>7</td><td>71</td><td>183</td><td>MOD</td><td>149.75</td><td>0</td></tr></table></div>	ID	Name	Sex	Age	Date	Height	Weight	Act Level	Fee	flag	2458	Murray, W	M	27	1	72	168	HIGH	85.20	0	2462	Almers, C	F	34	3	66	152	HIGH	124.80	0	2501	Bonaventure, T	F	31	17	61	123	LOW	149.75	0	2523	Johnson, R	F	43	31	63	137	MOD	149.75	0	2539	LaMance, K	M	51	4	71	158	LOW	124.80	0	2544	Jones, M	M	29	6	76	193	HIGH	124.80	0	2552	Reberson, P	F	32	9	67	151	MOD	149.75	0	2555	King, E	M	35	13	70	173	MOD	149.75	0	2563	Pitts, D	M	34	22	73	154	LOW	124.80	0	2568	Eberhardt, S	F	49	27	64	172	LOW	124.80	0	2571	Nunnelly, A	F	44	19	66	140	HIGH	149.75	0	2572	Oberon, M	F	28	17	62	118	LOW	85.20	0	2574	Peterson, V	M	30	6	69	147	LOW	149.75	0	2575	Quigley, M	F	40	8	69	163	HIGH	124.80	1	2578	Cameron, L	M	47	5	72	173	NA	124.80	0	2579	Underwood, K	M	60	22	71	191	LOW	149.75	1	2584	Takahashi, Y	F	43	29	65	123	MODY	124.80	0	2586	Derber, B	M	25	23	75	188	HIGH	85.20	0	2588	Ivan, H	F	22	20	63	139	LOW	85.20	0	2589	Wilcox, E	F	41	16	67	141	HIGH	149.75	0	2595	Warren, C	M	54	7	71	183	MOD	149.75	0
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2595	Warren, C	M	54	7	71	183	MOD	149.75	0																																																																																																																																																																																																																				
<pre>proc sql;  select *, case when age in (select age from a) then 1 else 0 end as flag from sasuser.admit;  quit;</pre>	<div><div>Explained:</div><div>This gets the output from within S.A dataset with a “flag” variable where flag =1 if any age from S.A matches any age in dataset “a” here, else flag=0</div></div>																																																																																																																																																																																																																												
<pre>/*Prog 7*/</pre>	<div><div>Output</div><div>Another way to write the same query. Output, same as above in prog 6.</div></div>																																																																																																																																																																																																																												
<pre>/*Prog 8*/ Using Sub Query</pre>	<div><div>Output</div><div><table><tr><th></th><th>Route</th><th>count</th></tr><tr><td>1</td><td>Route1</td><td>17</td></tr><tr><td>2</td><td>Route2</td><td>4</td></tr><tr><td>3</td><td>Route3</td><td>16</td></tr><tr><td>4</td><td>Route4</td><td>5</td></tr><tr><td>5</td><td>Route5</td><td>6</td></tr><tr><td>6</td><td>Route6</td><td>1</td></tr><tr><td>7</td><td>Route7</td><td>1</td></tr></table></div><div><div>Explained:</div><div>This query creates table “r ” as above.</div></div></div>		Route	count	1	Route1	17	2	Route2	4	3	Route3	16	4	Route4	5	5	Route5	6	6	Route6	1	7	Route7	1																																																																																																																																																																																																				
	Route	count																																																																																																																																																																																																																											
1	Route1	17																																																																																																																																																																																																																											
2	Route2	4																																																																																																																																																																																																																											
3	Route3	16																																																																																																																																																																																																																											
4	Route4	5																																																																																																																																																																																																																											
5	Route5	6																																																																																																																																																																																																																											
6	Route6	1																																																																																																																																																																																																																											
7	Route7	1																																																																																																																																																																																																																											
<pre>select * from r where count =(select max(count) from r);  quit;</pre>	<div><div>The SAS System16:28 Friday, May 8, 200918</div><table><tr><th>Route</th><th>count</th></tr><tr><td>Route1</td><td>17</td></tr></table></div> <div><div>Explained:</div><div>This query gets the output with max count for any route.</div></div>	Route	count	Route1	17																																																																																																																																																																																																																								
Route	count																																																																																																																																																																																																																												
Route1	17																																																																																																																																																																																																																												
<pre>Using inline view  proc sql; select * from (</pre>	<div>(same output as above)</div>																																																																																																																																																																																																																												

<pre>select route,count(*) as count from sasuser.cargorev group by route) where count = (select max(count) from (select route, count(*) as count from sasuser.cargorev group by route)); quit;</pre>	
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<b>/*Prog 9*/</b>	<b>Output</b>
<pre>proc sql; select country,count(*) as count from sasuser.empdata group by country; quit;</pre>	<pre> The SAS System          16:28 Friday, May 8, Employee Country of Residence              count ----- BELGIUM                    1 CANADA                     3 DENMARK                    1 EUROPEAN HQ                1 GERMANY                    1 UNITED KINGDOM             2 USA                        41</pre> <p><b>Explained:</b> This query gets the output with country wise count.</p>

<b>/*Prog 10*/ Using inline view</b>	<b>Output</b>
<pre>proc sql; select * from (select country,count(*) as count from sasuser.empdata group by country ) where count=1; quit;</pre>	<pre> The SAS System          16:28 F Employee Country of Residence              count ----- BELGIUM                    1 DENMARK                    1 EUROPEAN HQ                1 GERMANY                    1</pre> <p><b>Explained:</b> This query gives a country wise output where count = 1.</p>

<b>/*Prog 11*/</b>	<b>Output</b>
<pre>proc sql; select country,location,count(*) as count from sasuser.empdata group by country,location; quit;</pre>	<pre> The SAS System          16:28 Frida Employee Country      Employee Office of Residence          Location      count ----- BELGIUM              BRUSSELS          1 CANADA               TORONTO           3 DENMARK              COPENHAGEN        1 EUROPEAN HQ          FRANKFURT         1 GERMANY              FRANKFURT         1 UNITED KINGDOM       LONDON            2 USA                  AUSTIN            1 USA                  BOSTON            1 USA                  CARY              37 USA                  HOUSTON           1 USA                  PHOENIX           1</pre> <p><b>Explained:</b> This query gets the output with country wise, location-wise count.</p>

<b>/*Prog 12*/ Using inline view</b>	<b>Output</b>
<pre>proc sql; select * from (select country,location,count(*)</pre>	

<pre>as count from sasuser.empdata group by country,location ) where country="USA" and count=1; quit;</pre>	<div><div>The SAS System16:28 Friday</div><table><tr><th>Employee Country of Residence</th><th>Employee Office Location</th><th>count</th></tr><tr><td>USA</td><td>AUSTIN</td><td>1</td></tr><tr><td>USA</td><td>BOSTON</td><td>1</td></tr><tr><td>USA</td><td>HOUSTON</td><td>1</td></tr><tr><td>USA</td><td>PHOENIX</td><td>1</td></tr></table><p><b>Explained:</b> This query gets the output with country wise, location-wise count but with country = USA and Count =1</p></div>	Employee Country of Residence	Employee Office Location	count	USA	AUSTIN	1	USA	BOSTON	1	USA	HOUSTON	1	USA	PHOENIX	1										
Employee Country of Residence	Employee Office Location	count																								
USA	AUSTIN	1																								
USA	BOSTON	1																								
USA	HOUSTON	1																								
USA	PHOENIX	1																								
<div><div>/*Prog 13*/ Using inline view</div></div>	<div><div>Output</div><div><div>The SAS System16:28 Friday, May 8, 2009</div><table><tr><th>count</th></tr><tr><td>4</td></tr></table><p><b>Explained:</b> This query gets the output for the total count of country wise, location-wise count with country = USA and Count =1</p></div></div>	count	4																							
count																										
4																										
<div><div>/*Prog 14*/ Using inline view</div></div>	<div><div>Output</div><div><div>The SAS System03:48 Saturday, Ma</div><table><tr><th>Employee Country of Residence</th><th>Employee Office Location</th><th>count</th><th>total</th></tr><tr><td>USA</td><td>AUSTIN</td><td>1</td><td>4</td></tr><tr><td>USA</td><td>BOSTON</td><td>1</td><td>4</td></tr><tr><td>USA</td><td>HOUSTON</td><td>1</td><td>4</td></tr><tr><td>USA</td><td>PHOENIX</td><td>1</td><td>4</td></tr></table><p><b>Explained:</b> This query gets the output for the total count of country wise, location-wise count with country = USA and Count =1 with all attributes of the same.</p></div></div>	Employee Country of Residence	Employee Office Location	count	total	USA	AUSTIN	1	4	USA	BOSTON	1	4	USA	HOUSTON	1	4	USA	PHOENIX	1	4					
Employee Country of Residence	Employee Office Location	count	total																							
USA	AUSTIN	1	4																							
USA	BOSTON	1	4																							
USA	HOUSTON	1	4																							
USA	PHOENIX	1	4																							
<div><div>/*Prog 15*/ Using inline view</div></div>	<div><div>Output</div><div><div>The SAS System16:28 Friday, May 8, 2009</div><table><tr><th>Employee Country of Residence</th><th>Employee Office Location</th><th>count</th><th>total</th><th>pc</th></tr><tr><td>USA</td><td>AUSTIN</td><td>1</td><td>4</td><td>25.00%</td></tr><tr><td>USA</td><td>BOSTON</td><td>1</td><td>4</td><td>25.00%</td></tr><tr><td>USA</td><td>HOUSTON</td><td>1</td><td>4</td><td>25.00%</td></tr><tr><td>USA</td><td>PHOENIX</td><td>1</td><td>4</td><td>25.00%</td></tr></table><p><b>Explained:</b> This query gets the same output as in Prog 14, but with percent format used along.</p></div></div>	Employee Country of Residence	Employee Office Location	count	total	pc	USA	AUSTIN	1	4	25.00%	USA	BOSTON	1	4	25.00%	USA	HOUSTON	1	4	25.00%	USA	PHOENIX	1	4	25.00%
Employee Country of Residence	Employee Office Location	count	total	pc																						
USA	AUSTIN	1	4	25.00%																						
USA	BOSTON	1	4	25.00%																						
USA	HOUSTON	1	4	25.00%																						
USA	PHOENIX	1	4	25.00%																						

```

sasuser.empdata group by
country,location
) where country="USA" and
count=1
);
quit;

```

### Difference between Subquery and Inline View:

Subquery	Inline View
<ul style="list-style-type: none"> <li>Returns value / values and is used with where.</li> <li>Operator used is “ IN ”.</li> <li>Summary functions (like: max (), avg () etc) does not work with where hence sub-query is used.</li> <li>Summary functions work only with select and having</li> </ul>	<ul style="list-style-type: none"> <li>Returns a table, used with from.</li> <li>This table has no physical presence</li> </ul>