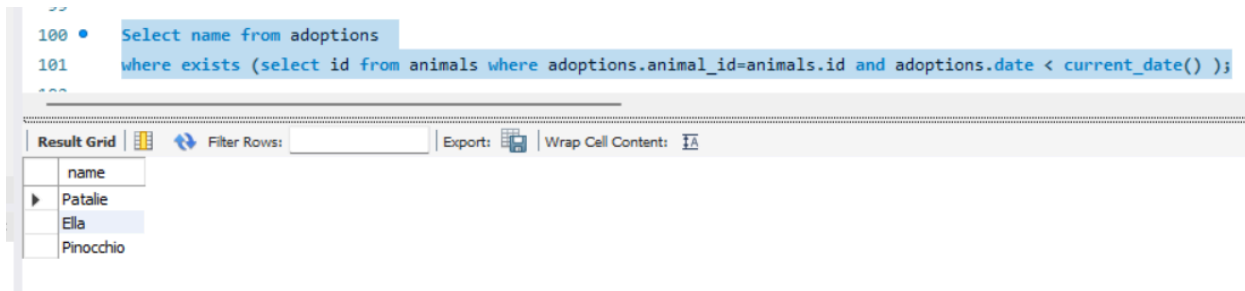
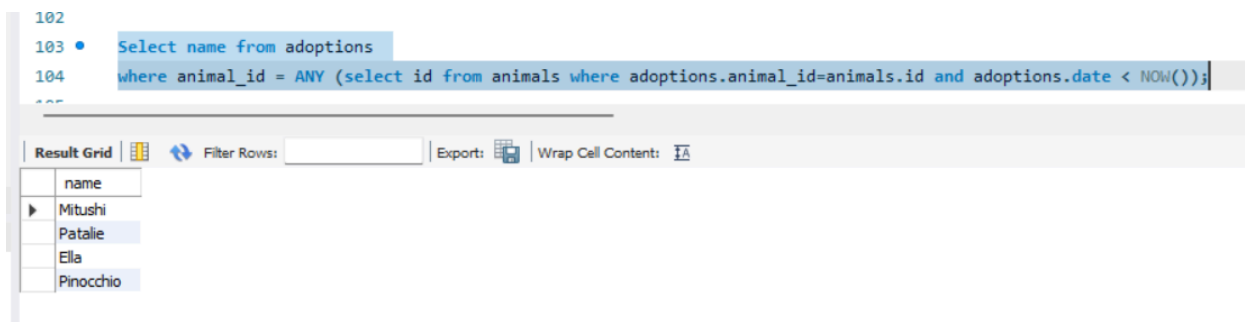


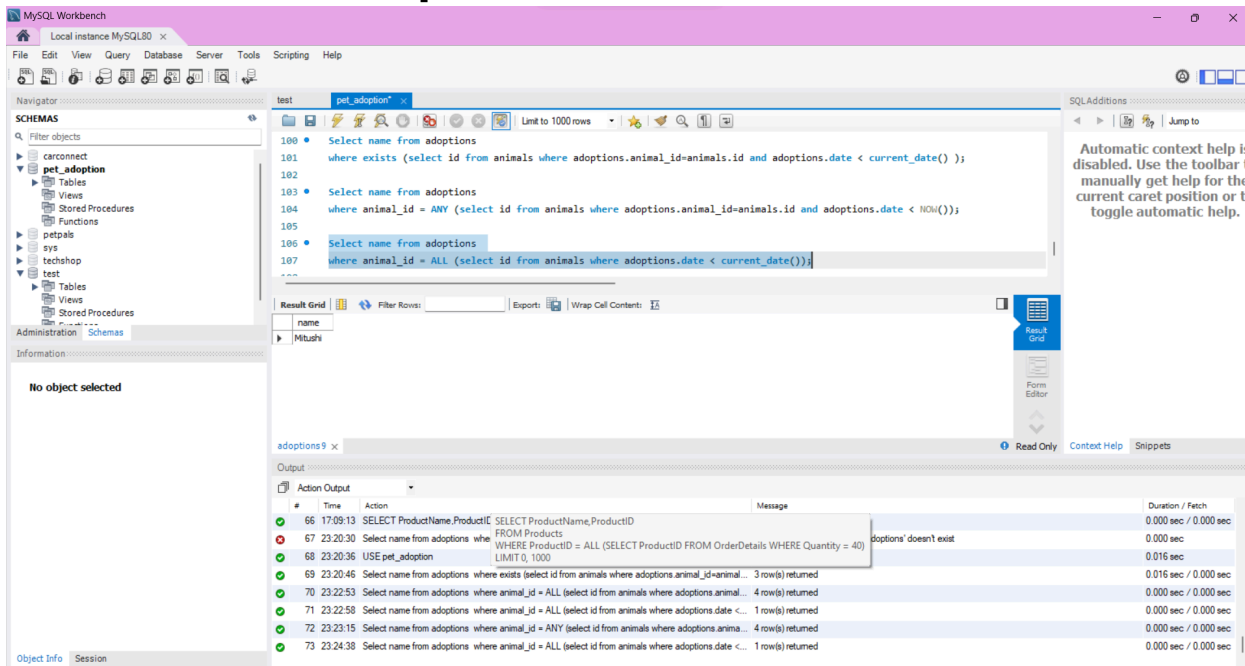
SQL EXISTS Operator



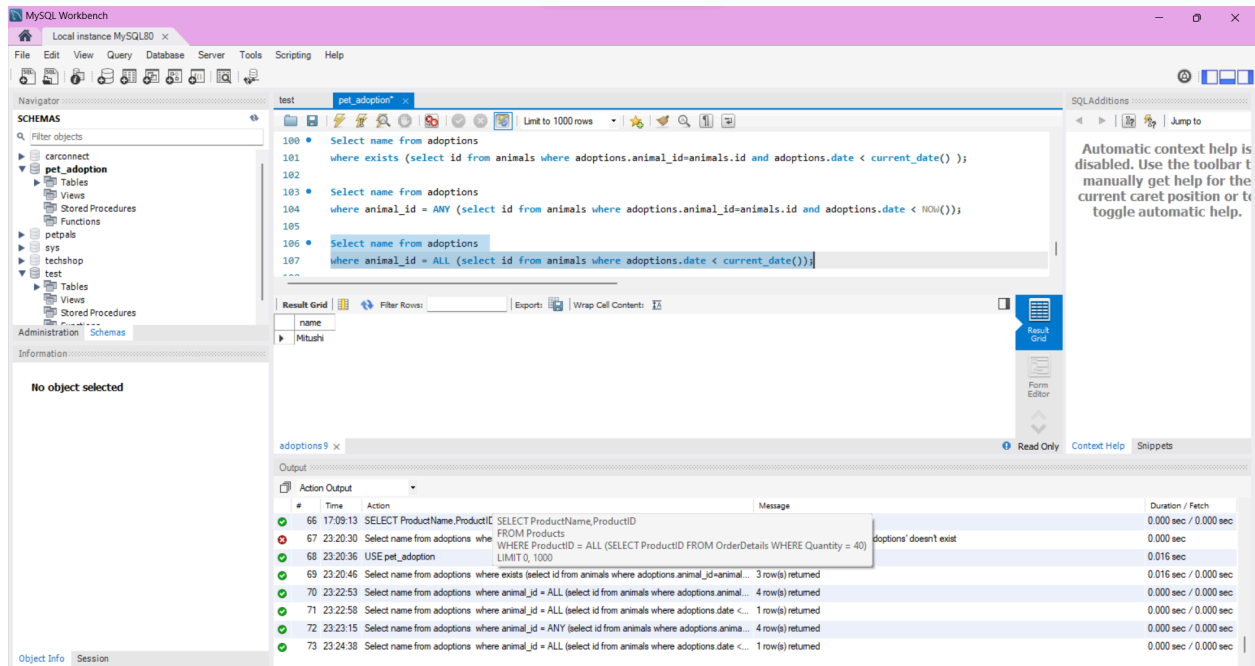
The SQL ANY Operator



The SQL ALL Operator



Using SubQuery



Hands on ExerciseTotal Aggregations using SQL Queries

AVG() — The Mean Average

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

carconnect
pet_adoption
petpals
sys
techshop
test

Tables
Views
Stored Procedures
Functions

Administration Schemas

Information

No object selected

Object Info Session

test pet_adoption

Limit to 1000 rows

```
78  
79 SELECT COUNT(OrderID),OrderID FROM OrderDetails GROUP BY OrderID;  
80  
81  
82 SELECT OrderID FROM OrderDetails GROUP BY OrderID  
83 HAVING max(Quantity) > ALL (SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID);  
84  
85 SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID;  
86
```

Result Grid

avg(Quantity)
9.0000
24.5000
20.0000
10.5000

Filter Rows: Exports: Wrap Cell Contents:

Read Only Context Help Snippets

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Output

Action Output

#	Time	Action	Message	Duration / Fetch
73	23:24:38	Select name from adoptions where animal_id = ALL (select id from animals where adoptions.date <= ...)	1 row(s) returned	0.000 sec / 0.000 sec
74	23:26:12	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELECT ...)	Error Code: 1146. Table 'pet_adoption.orderdetails' doesn't exist	0.000 sec
75	23:26:18	use test	0 row(s) affected	0.015 sec
76	23:26:51	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELECT ...)	2 row(s) returned	0.000 sec / 0.000 sec
77	23:28:26	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.016 sec / 0.000 sec
78	23:29:56	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
79	23:31:06	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELECT ...)	2 row(s) returned	0.000 sec / 0.000 sec
80	23:31:26	SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec

COUNT

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

carconnect
pet_adoption
petpals
sys
techshop
test

Tables
Views
Stored Procedures
Functions

Administration Schemas

Information

No object selected

Object Info Session

test pet_adoption

Limit to 1000 rows

```
70 (6, 10250, 6, 15),  
71 (9, 10251, 2, 6),  
72 (10, 10251, 7, 15);  
73  
74 SELECT ProductName,ProductID FROM Products  
75 WHERE ProductID = ALL (SELECT ProductID FROM OrderDetails WHERE Quantity = 40);  
76  
77 SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID;  
78
```

Result Grid

COUNT(ProductID)	ProductID
2	1
1	2
2	4
2	5
1	6
2	7

Filter Rows: Exports: Wrap Cell Contents:

Read Only Context Help Snippets

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Output

Action Output

#	Time	Action	Message	Duration / Fetch
71	23:22:58	Select name from adoptions where animal_id = ALL (select id from animals where adoptions.date <= ...)	1 row(s) returned	0.000 sec / 0.000 sec
72	23:23:15	Select name from adoptions where animal_id = ANY (select id from animals where adoptions.date <= ...)	4 row(s) returned	0.000 sec / 0.000 sec
73	23:24:38	Select name from adoptions where animal_id = ALL (select id from animals where adoptions.date <= ...)	1 row(s) returned	0.000 sec / 0.000 sec
74	23:26:12	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELECT ...)	Error Code: 1146. Table 'pet_adoption.orderdetails' doesn't exist	0.000 sec
75	23:26:18	use test	0 row(s) affected	0.015 sec
76	23:26:51	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELECT ...)	2 row(s) returned	0.000 sec / 0.000 sec
77	23:28:26	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.016 sec / 0.000 sec
78	23:29:56	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec

MAX

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

Filter objects

SCHEMAS

- carconnect
- pet_adoption
 - Tables
 - Views
 - Stored Procedures
- petpals
- sys
- techshop
- test
 - Tables
 - Views
 - Stored Procedures

Administration Schemas

Information

No object selected

test x pet_adoption

Limit to 1000 rows

```
78
79 SELECT COUNT(OrderID),OrderID FROM OrderDetails GROUP BY OrderID;
80
81
82 SELECT OrderID FROM OrderDetails GROUP BY OrderID
83 HAVING max(Quantity) > ALL (SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID);
84
85 SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID;
86 SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID;
```

Result Grid

	max(Quantity)	OrderID
12	10248	
40	10249	
35	10250	
15	10251	

Result 55 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
75	23:26:18	use test	0 row(s) affected	0.015 sec
76	23:26:51	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELEC...	2 row(s) returned	0.000 sec / 0.000 sec
77	23:28:26	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.016 sec / 0.000 sec
78	23:29:56	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
79	23:31:06	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELEC...	2 row(s) returned	0.000 sec / 0.000 sec
80	23:31:26	SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
81	23:32:53	SELECT max(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
82	23:33:03	SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.016 sec / 0.000 sec

Object Info Session

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

MIN

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator

Filter objects

SCHEMAS

- carconnect
- pet_adoption
 - Tables
 - Views
 - Stored Procedures
- petpals
- sys
- techshop
- test
 - Tables
 - Views
 - Stored Procedures

Administration Schemas

Information

No object selected

test x pet_adoption

Limit to 1000 rows

```
79 SELECT COUNT(OrderID),OrderID FROM OrderDetails GROUP BY OrderID;
80
81
82 SELECT OrderID FROM OrderDetails GROUP BY OrderID
83 HAVING max(Quantity) > ALL (SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID);
84
85 SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID;
86 SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID;
87 SELECT min(Quantity),OrderID FROM OrderDetails GROUP BY OrderID;
```

Result Grid

	min(Quantity)	OrderID
5	10248	
9	10249	
10	10250	
6	10251	

Result 56 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
76	23:26:51	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELEC...	2 row(s) returned	0.000 sec / 0.000 sec
77	23:28:26	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.016 sec / 0.000 sec
78	23:29:56	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
79	23:31:06	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELEC...	2 row(s) returned	0.000 sec / 0.000 sec
80	23:31:26	SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
81	23:32:53	SELECT max(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
82	23:33:03	SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.016 sec / 0.000 sec
83	23:33:50	SELECT min(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec

Object Info Session

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

SUM

The screenshot shows the MySQL Workbench interface with a query editor and a result grid. The query is as follows:

```
80
81
82 SELECT OrderID FROM OrderDetails GROUP BY OrderID
83 HAVING max(Quantity) > ALL (SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID);
84
85 SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID;
86 SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID;
87 SELECT min(Quantity),OrderID FROM OrderDetails GROUP BY OrderID;
88 SELECT sum(Quantity),OrderID FROM OrderDetails GROUP BY OrderID;
```

The result grid shows the output of the last query (line 88):

sum(Quantity)	OrderID
27	10248
46	10249
60	10250
21	10251

The output pane shows the execution log with the following entries:

#	Time	Action	Message	Duration / Fetch
77	23:28:26	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.016 sec / 0.000 sec
78	23:29:56	SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
79	23:31:06	SELECT OrderID FROM OrderDetails GROUP BY OrderID HAVING max(Quantity) > ALL (SELEC...	2 row(s) returned	0.000 sec / 0.000 sec
80	23:31:26	SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
81	23:32:53	SELECT max(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
82	23:33:03	SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.016 sec / 0.000 sec
83	23:33:50	SELECT min(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
84	23:34:26	SELECT sum(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec

Hands On Order of Execution of SQL Queries

The screenshot shows the MySQL Workbench interface with a query editor and a result grid. The query is as follows:

```
82 SELECT OrderID FROM OrderDetails GROUP BY OrderID
83 HAVING max(Quantity) > ALL (SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID);
84
85 SELECT avg(Quantity) FROM OrderDetails
86 WHERE Quantity>1
87 GROUP BY OrderID
88 HAVING avg(Quantity)>10
89 ORDER BY avg(Quantity) ASC
90 LIMIT 5;
```

The result grid shows the output of the last query (line 90):

avg(Quantity)
10.5000
20.0000
24.5000

The output pane shows the execution log with the following entries:

#	Time	Action	Message	Duration / Fetch
81	23:32:53	SELECT max(Quantity) FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
82	23:33:03	SELECT max(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.016 sec / 0.000 sec
83	23:33:50	SELECT min(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
84	23:34:26	SELECT sum(Quantity),OrderID FROM OrderDetails GROUP BY OrderID LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
85	23:37:00	select * from orderdetails LIMIT 0, 1000	10 row(s) returned	0.000 sec / 0.000 sec
86	23:38:22	SELECT avg(Quantity) FROM OrderDetails WHERE Quantity>1 GROUP BY OrderID HAVING av...	3 row(s) returned	0.016 sec / 0.000 sec
87	23:39:48	SELECT avg(Quantity) FROM OrderDetails WHERE Quantity>1 GROUP BY OrderID HAVING av...	Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to yo...	0.000 sec
88	23:40:24	SELECT avg(Quantity) FROM OrderDetails WHERE Quantity>1 GROUP BY OrderID HAVING av...	3 row(s) returned	0.015 sec / 0.000 sec

Hands on Exercise: Filter Data based on Aggregated Results using Group By and Having

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'pet_adoption' database schema. The main editor contains a SQL query that filters data based on aggregated results using Group By and Having. The query is as follows:

```
SELECT OrderID FROM OrderDetails GROUP BY OrderID
HAVING max(Quantity) > ALL (SELECT avg(Quantity) FROM OrderDetails GROUP BY OrderID);

SELECT avg(Quantity) FROM OrderDetails
WHERE Quantity>1
GROUP BY OrderID
HAVING avg(Quantity)>10
ORDER BY avg(Quantity) ASC
LIMIT 5;
```

The 'Result Grid' shows the output of the query, displaying the average quantity for each order ID. The 'Output' pane shows the execution log, including the query text and the duration of each statement.

avg(Quantity)
10.5000
20.0000
24.5000

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Hands on Exercise: Group By Aggregations using SQL Queries

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'pet_adoption' database schema. The main editor contains a SQL query that filters data based on aggregated results using Group By and Having. The query is as follows:

```
SELECT ProductName,ProductID FROM Products
WHERE ProductID = ALL (SELECT ProductID FROM OrderDetails WHERE Quantity = 40);

SELECT COUNT(ProductID),ProductID FROM OrderDetails GROUP BY ProductID;

SELECT COUNT(OrderID),OrderID FROM OrderDetails GROUP BY OrderID;
```

The 'Result Grid' shows the output of the query, displaying the count of order IDs for each product ID. The 'Output' pane shows the execution log, including the query text and the duration of each statement.

COUNT(OrderID)	OrderID
3	10248
2	10249
3	10250
2	10251

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Using Correlated Subqueries

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' panel with a tree view of databases including 'pet_adoption'. The main editor window contains a SQL script with the following queries:

```
97
98 insert into adoptions (name,contact,date,animal_id) values ('Mitushi','mitu@gmail.com',NOW(),1);
99
100 select name from adoptions
101 where exists (select id from animals where adoptions.animal_id=animals.id and adoptions.date < current_date() );
102
103 select name from adoptions
104 where animal_id = ANY (select id from animals where adoptions.animal_id=animals.id and adoptions.date < NOW());
```

Below the SQL editor, the 'Result Grid' shows the results of the first query, displaying a single row with the name 'Mitushi'.

The 'Output' panel at the bottom shows the execution log, including the following entries:

#	Time	Action	Message	Duration / Fetch
65	14:54:57	select datediff (year, convert (datetime,'2006-05-06'), convert (datetime,'2009-01-01'))	Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to yo...	0.000 sec
66	17:09:13	SELECT ProductName,ProductID FROM Products WHERE ProductID = ALL (SELECT ProductID...	1 row(s) returned	0.000 sec / 0.000 sec
67	23:20:30	Select name from adoptions where exists (select id from animals where adoptions.animal_id=animal...	Error Code: 1146. Table 'test.adoptions' doesn't exist	0.000 sec
68	23:20:36	USE pet_adoption	0 row(s) affected	0.016 sec
69	23:20:46	Select name from adoptions where exists (select id from animals where adoptions.animal_id=animal...	3 row(s) returned	0.016 sec / 0.000 sec
70	23:22:53	Select name from adoptions where animal_id = ALL (select id from animals where adoptions.animal...	4 row(s) returned	0.000 sec / 0.000 sec
71	23:22:58	Select name from adoptions where animal_id = ALL (select id from animals where adoptions.date <...	1 row(s) returned	0.000 sec / 0.000 sec
72	23:23:15	Select name from adoptions where animal_id = ANY (select id from animals where adoptions.anima...	4 row(s) returned	0.000 sec / 0.000 sec