

# Arithmetic Expressions

```
SELECT stock_num, manu_code, description,  
       unit_price, unit_price * 1.05  
FROM stock  
ORDER BY description, unit_price desc
```

stock_num	manu_code	description	unit_price	(expression)
111	SHM	10-spd, assmbld	\$499.99	\$524.99
112	SHM	12-spd, assmbld	\$549.00	\$576.45
113	SHM	18-spd, assmbld	\$685.90	\$720.20
205	ANZ	3 golf balls	\$312.00	\$327.60
205	NKL	3 golf balls	\$312.00	\$327.60
205	HRO	3 golf balls	\$312.00	\$327.60
2	HRO	baseball	\$126.00	\$132.30
...	...	...	...	...
304	ANZ	watch	\$170.00	\$178.50
311	SHM	water gloves	\$48.00	\$50.40

# The ROUND and TRUNC Functions

```
SELECT stock_num, manu_code,  
       unit_price * 1.05,  
       ROUND (unit_price * 1.05, 1),  
       TRUNC (unit_price * 1.05, 1)  
FROM stock
```

stock_num	manu_code	(expression)	(expression)	(expression)
1	HRO	\$262.50	262.5	262.5
1	HSK	\$840.00	840.0	840.0
1	SMT	\$472.50	472.5	472.5
2	HRO	\$132.30	132.3	132.3
3	HSK	\$252.00	252.0	252.0
3	SHM	\$294.00	294.0	294.0
4	HSK	\$1008.00	1008.0	1008.0
...	...	...	...	...

# Display Labels

```
SELECT      stock_num, manu_code, description,  
            unit_price, unit_price * 1.05 new_price  
FROM        stock  
ORDER BY    description, new_price desc
```

stock_num	manu_code	description	unit_price	new_price
111	SHM	10-spd, assmbld	\$499.99	\$524.9895
112	SHM	12-spd, assmbld	\$549.00	\$576.4500
113	SHM	18-spd, assmbld	\$685.90	\$720.1950
205	ANZ	3 golf balls	\$312.00	\$327.6000
205	NKL	3 golf balls	\$312.00	\$327.6000
205	HRO	3 golf balls	\$312.00	\$327.6000
2	HRO	baseball	\$126.00	\$132.3000
...	...	...	...	...
311	SHM	water gloves	48.00	\$50.4000

# Aggregate Functions

COUNT (\*)

COUNT (DISTINCT column-name)

SUM (column/expression)

SUM (DISTINCT column-name)

AVG (column/expression)

AVG (DISTINCT column-name)

MAX (column/expression)

MIN (column/expression)

# The COUNT Function

Given a *hypothetical* subset of the **stock** table:

1	HRO	baseball gloves	\$250.00	case	10 gloves/case
1	HSK	baseball gloves	\$800.00	case	10 gloves/case
1	SMT	baseball gloves	\$450.00	case	10 gloves/case
2	HRO	baseball	\$126.00	case	24/case
3	HSK	baseball bat	\$240.00	case	12/case

```
SELECT COUNT(*)  
FROM stock;
```

(count(\*))  
5

```
SELECT COUNT(DISTINCT description)  
FROM stock;
```

(count)  
3

# The SUM Function

Given a hypothetical subset of the **items** table:

1	1001	1	HRO	1	\$250.00
1	1002	4	HSK	1	\$960.00
2	1002	3	HSK	1	\$240.00
1	1004	1	HRO	1	\$250.00
2	1004	2	HRO	1	\$126.00
3	1004	3	HSK	1	\$240.00
4	1004	1	HSK	1	\$800.00

```
SELECT SUM(total_price)
FROM items;
```

(sum) \$2866.00
--------------------

```
SELECT SUM(total_price) total
FROM items;
```

total \$2866.00
--------------------

# Additional Examples

**SELECT MAX(unit\_price) FROM stock;**

(max)

\$960.00

**SELECT MIN(order\_date) FROM orders;**

(min)

05/20/1994

**SELECT AVG(unit\_price) FROM stock;**

(avg)

\$197.14

# SELECT Statement Clauses

SELECT select-list

FROM table-name

[WHERE condition]

[**GROUP BY** column-list]

[**HAVING** condition]

[ORDER BY column-name]

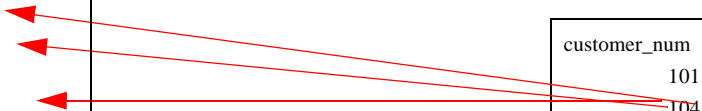


# GROUP BY

```
SELECT      customer_num  
FROM        orders  
GROUP BY customer_num
```

customer_num
101
104
104
104
104
106
106
110
110
111
112
225
...

customer_num
101
104
106
110
111
112
115
116
117
119
...
127



# GROUP BY and Aggregates

order_num	total_price
1001	\$250.00
<b>1002</b>	<b>\$960.00</b>
<b>1002</b>	<b>\$240.00</b>
1003	\$20.00
1003	\$840.00
1003	\$99.00
1004	\$250.00
1004	\$126.00
1004	\$240.00
1004	\$800.00
1005	\$280.00
1005	\$198.00
1005	\$36.00
1005	\$48.00
...	...
1023	\$170.00
1023	\$190.00

```
SELECT  order_num,  
        sum(total_price) tot  
FROM items  
GROUP BY order_num
```

Adds for each  
group

order_num	tot
1001	\$250.00
<b>1002</b>	<b>\$1200.00</b>
1003	\$959.00
1004	\$1416.00
1005	\$562.00
...	...
1023	\$824.00

# Another Example

```
SELECT city, state, COUNT(*)  
FROM customer  
GROUP BY city, state
```

city	state	(count(*))
Sunnyvale	CA	3
San Francisco	CA	1
Palo Alto	CA	2
Redwood City	CA	5
Los Altos	CA	2
Mountain View	CA	2
Menlo Park	CA	2
Oakland	CA	1
Cherry Hill	NJ	1
Phoenix	AZ	2
Wilmington	DE	1
Princeton	NJ	1
Jacksonville	FL	1
Bartlesville	OK	1
Brighton	MA	1
Denver	CO	1
Blue Island	NY	1

# Ordering Grouped Data

```
SELECT city, state,  
       COUNT(*)  
FROM customer  
GROUP BY 1, 2  
ORDER BY 1, 2
```

city	state	(count(*))
Bartlesville	OK	1
Blue Island	NY	1
Brighton	MA	1
Cherry Hill	NJ	1
Denver	CO	1
Jacksonville	FL	1
Los Altos	CA	2
Menlo Park	CA	2
Mountain View	CA	2
Oakland	CA	1
Palo Alto	CA	2
Phoenix	AZ	2
Princeton	NJ	1
Redwood City	CA	5
San Francisco	CA	1
Sunnyvale	CA	3
Wilmington	DE	1

# The HAVING Clause

```
SELECT order_num, SUM(total_price) tot  
FROM items  
GROUP BY order_num  
HAVING COUNT(*) > 2;
```

order_num	tot
1003	\$959.00
1004	\$1416.00
1005	\$562.00
1006	\$448.00
1007	\$1696.00
1013	\$143.80
1016	\$654.00
1017	\$584.00
1018	\$1131.00
1021	\$1614.00
1022	\$232.00
1023	\$824.00

# Another Example

```
SELECT  stock_num, description, COUNT(*) ,  
        AVG(unit_price) average,  
        MAX(unit_price) biggest,  
        MIN(unit_price) smallest  
FROM stock  
GROUP BY stock_num, description  
HAVING MIN(unit_price) > 400
```

stock_num	description	(count(*))	average	biggest	smallest
4	football	2	\$720.00	\$960.00	\$480.00
7	basketball	1	\$600.00	\$600.00	\$600.00
8	volleyball	1	\$840.00	\$840.00	\$840.00
111	10-spd, assmbld	1	\$499.99	\$499.99	\$499.99
112	12_spd, assmbld	1	\$549.00	\$549.00	\$549.00
113	18-spd, assmbld	1	\$685.90	\$685.90	\$685.90
203	irons/wedge	1	\$670.00	\$670.00	\$670.00

# The INTO TEMP Clause

```
SELECT select-list  
  FROM table-name  
  [WHERE condition]  
  [GROUP BY column-list]  
  [HAVING condition]  
  [ORDER BY column-name]  
  [INTO TEMP table-name [WITH NO LOG]]
```

# INTO TEMP Example

```
SELECT stock_num, manu_code, description,  
       unit_price * 1.05 final_price  
FROM stock  
INTO TEMP stocktemp WITH NO LOG;  
SELECT * FROM stocktemp
```

stocktemp			
stock_num	manu_code	description	final_price
1	HRO	baseball gloves	\$262.50
1	HSK	baseball gloves	\$840.00
1	SMT	baseball gloves	\$472.50
2	HRO	baseball	\$132.30
3	HSK	baseball bat	\$252.00
3	SHM	baseball bat	\$294.00
4	HRO	football	\$504.00
4	HSK	football	\$1008.00
...	...	...	...
313	SHM	swim cap	\$75.60