The University of Texas at Austin
McCombs School of Business

MIS 381N INTRO. TO DATABASE MANAGEMENT

Select

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QUESTIONS

Any questions

before we begin …

AGENDA

Lecture	Select
Hands-On	Exercises
Looking Forward	Homework 3 Quiz 3

Select

SIX STEPS (WHICH TRANSLATE INTO THE SIX CLAUSES OF THE SELECT STATEMENT)

- What do you want to display?
- Where are you getting the data?
- Are there any conditions on attributes or join conditions?
- Do you need to group by any attribute?
- Are there any conditions on the aggregate functions?
- Do you want the results to appear in a certain order?

SIX STEPS (WHICH TRANSLATE INTO THE SIX CLAUSES OF THE SELECT STATEMENT)

- What do you want to display? SELECT
- Where are you getting the data? FROM
- Are there any conditions on attributes or join conditions? WHERE
- Do you need to group by any attribute? GROUP BY
- Are there any conditions on the aggregate functions? HAVING
- Do you want the results to appear in a certain order? ORDER BY

SELECT	Columns - Column names - Arithmetic expressions - Literals (text or numeric) - Scalar functions
FROM	Table or view names
WHERE	Conditions (qualifies rows)
ORDER BY	Sorts result rows

SELECT	Columns - Column names - Arithmetic expressions - Literals (text or numeric) - Scalar functions **- “Aggregate” functions**
FROM	Table or view names
WHERE	Conditions (qualifies rows)
ORDER BY	Sorts result rows
GROUP BY	**Creates sub totals in conjunction with column functions**
HAVING	**Conditions the sub totals**

LET’S TEST OUR UNDERSTANDING

How do you select all columns from a table?

How do you select specific columns from a table?

How do you filter records?

How do you sort records

LOOKING FORWARD

Read Chapters 3 and 7

Quiz 3

Homework 3

THANK YOU

BACKUP SLIDES

PART 1

Chapter 3

Select

What are 4 main parts of a SELECT statement?

- SELECT
- FROM
- WHERE
- ORDER BY

```
SELECT column_list
FROM table_source
[WHERE filter_condition]
[ORDER BY order_by_list]
```

Knowledge check

- How do you select all columns from a table?
- How do you select specific columns from a table?
- How do you filter records?
- How do you sort records?

SELECT syntax

```
SELECT column_list
 FROM table_source
 [WHERE filter_condition]
 [ORDER BY order_by_list]
```

e.g. SELECT all columns

```
SELECT *
FROM invoices
```

e.g. SELECT particular columns

```
SELECT invoice_number, invoice_date
FROM invoices
```

e.g. Sort with ORDER BY clause

```
SELECT invoice_number, invoice_date
FROM invoices
ORDER by invoice_date [DESC]
```

e.g. Select with WHERE clause

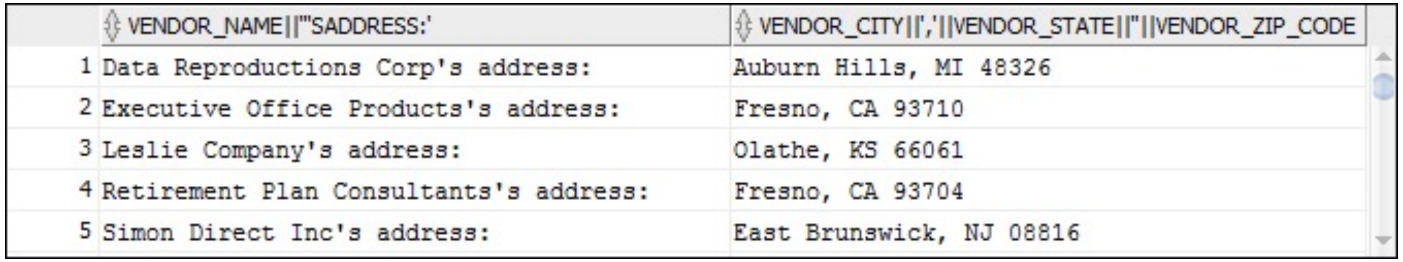
```
SELECT invoice_number, invoice_date
FROM invoices
WHERE invoice_date = ’02-MAY-2014’
```

Ways to specify columns in a query's SELECT clause

- ❑ **All columns** in base table
- ❑ **Column name** in base table
- ❑ **String Expression**
  - Use the string operator || to concatenate column or literal strings together
  - Literal strings are defined by you like the following:
  - **Select city || ',' || state** or **Select 'Mr. or Mrs.' || last_name**
- ❑ **Arithmetic Expression**
  - Use +, -, /, * to do arithmetic calcs on numeric columns
  - e.g. `Select invoice_total – payment_total`
- ❑ **Alias** – give custom column names for calculated columns
  - e.g. `Select (invoice_total – payment_total) as "Amount Owed"`
  - NOTE: Include Quotes (not ticks) around column alias if your column name has spaces are includes spaces. Good rule of thumb is to always use **AS** w/ **no spaces**

How to include apostrophes in literal values

```
SELECT vendor_name || '''s address: ',
       vendor_city || ', '
                   || vendor_state
                   || ' '
                   || vendor_zip_code
FROM vendors
```



	VENDOR_NAME||'''SADDRESS:'	VENDOR_CITY||','||VENDOR_STATE||''||VENDOR_ZIP_CODE
1	Data Reproductions Corp's address:	Auburn Hills, MI 48326
2	Executive Office Products's address:	Fresno, CA 93710
3	Leslie Company's address:	Olathe, KS 66061
4	Retirement Plan Consultants's address:	Fresno, CA 93704
5	Simon Direct Inc's address:	East Brunswick, NJ 08816

Terms to know

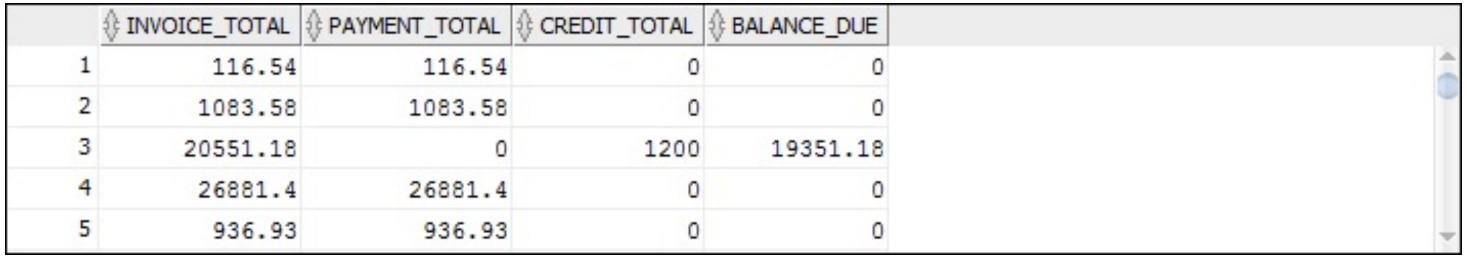
- String expression
- Literal value
- String literal (string constant)
- Concatenation operator

The arithmetic operators in order of precedence

*	Multiplication
/	Division
+	Addition
-	Subtraction

A SELECT statement that calculates balance due

```
SELECT invoice_total, payment_total, credit_total,
       invoice_total – payment_total – credit_total
           AS balance_due
FROM invoices
```



	INVOICE_TOTAL	PAYMENT_TOTAL	CREDIT_TOTAL	BALANCE_DUE
1	116.54	116.54	0	0
2	1083.58	1083.58	0	0
3	20551.18	0	1200	19351.18
4	26881.4	26881.4	0	0
5	936.93	936.93	0	0

Practice String/Numeric Expressions & Column Alias:

1. Select all vendors from NY but concatenate Address into this format: **Address; City, State Zip** Don’t include alias this time

2. Add a column alias to this newly created column called **“Vendor Address”**

3. Pull ***vendor_id***, ***invoice total***, ***payment total***, and ***difference of invoice_total & payment_total***. Rename calculate calculated to “Amount Owed”

String expression to derive full name

```
SELECT first_name || ' ' || last_name
```

String expression to derive full name w/ alias

```
SELECT first_name || ' ' || last_name as “Full Name”
```

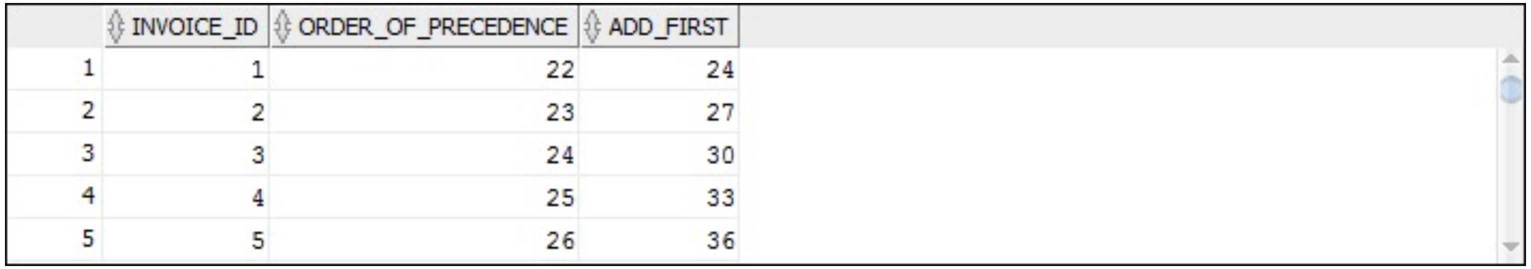
Arithmetic expression to calculate a value

```
SELECT invoice_number,
       invoice_total – payment_total - credit_total
FROM invoices
```

Order of operations

A SELECT statement that uses parentheses

```
SELECT invoice_id,
    invoice_id + 7 * 3 AS order_of_precedence,
    (invoice_id + 7) * 3 AS add_first
FROM invoices
ORDER BY invoice_id
```



	INVOICE_ID	ORDER_OF_PRECEDENCE	ADD_FIRST
1	1	22	24
2	2	23	27
3	3	24	30
4	4	25	33
5	5	26	36

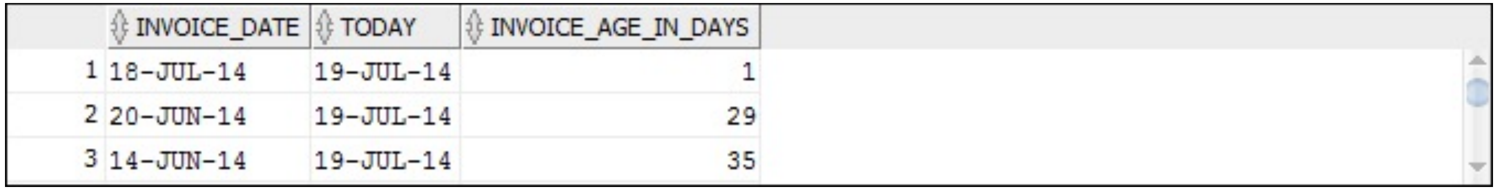
Scalar functions

- ❑ **Scalar** = Operates on a single value and returns a single value

- ❑ **SYSDATE** – returns today’s date/time. Like NOW() function in Excel
- ❑ **ROUND** – round decimals to whole numbers
- ❑ **SUBSTR** – Returns certain part of a string. Like MID() function in Excel
- ❑ **TO_CHAR** – convert number/date to string
- ❑ **TO_DATE** – convert string to a date
- ❑ **MOD** – returns remainder of division of two numbers

A SELECT statement that uses the SYSDATE and ROUND functions

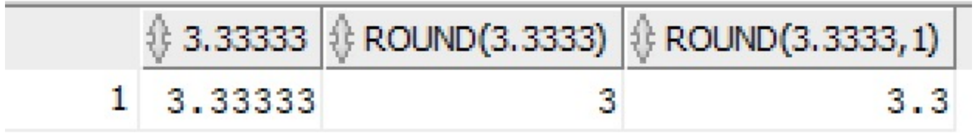
```
SELECT invoice_date,
    SYSDATE AS today,
    ROUND(SYSDATE - invoice_date)  AS invoice_age_in_days
FROM invoices
```



	INVOICE_DATE	TODAY	INVOICE_AGE_IN_DAYS
1	18-JUL-14	19-JUL-14	1
2	20-JUN-14	19-JUL-14	29
3	14-JUN-14	19-JUL-14	35

ROUND(number to found [,number of decimals])

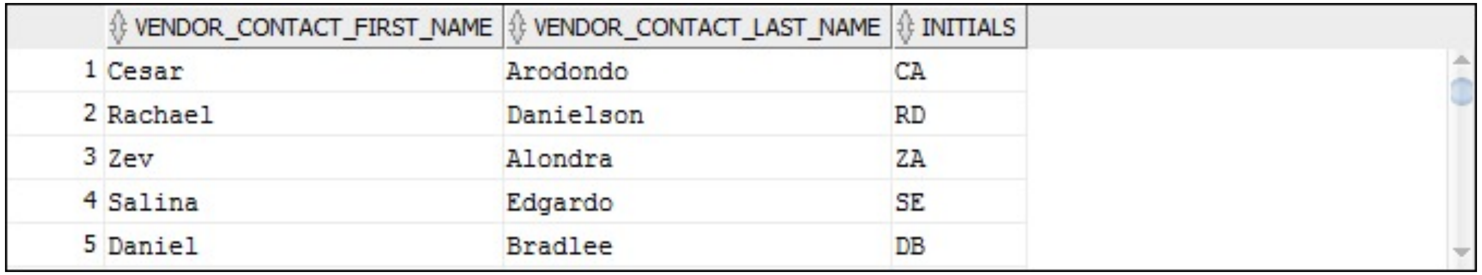
```
SELECT   3.33333,
         ROUND(3.3333),
         ROUND(3.3333,1)
FROM dual
```



	3.33333	ROUND(3.3333)	ROUND(3.3333,1)
1	3.33333	3	3.3

A SELECT statement that uses SUBSTR

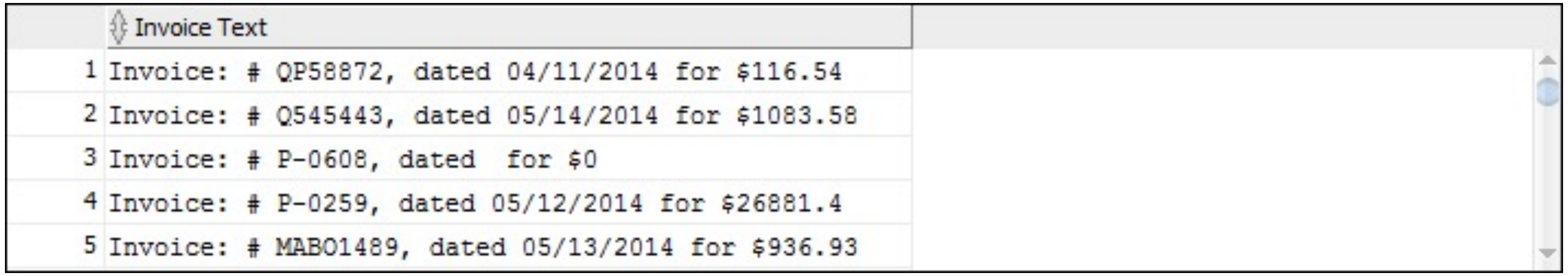
```
SELECT vendor_contact_first_name,
vendor_contact_last_name,
    SUBSTR(vendor_contact_first_name, 1, 1) ||
    SUBSTR(vendor_contact_last_name, 1, 1) AS initials
FROM vendors
```



	VENDOR_CONTACT_FIRST_NAME	VENDOR_CONTACT_LAST_NAME	INITIALS
1	Cesar	Arodondo	CA
2	Rachael	Danielson	RD
3	Zev	Alondra	ZA
4	Salina	Edgardo	SE
5	Daniel	Bradlee	DB

A SELECT statement that uses TO_CHAR

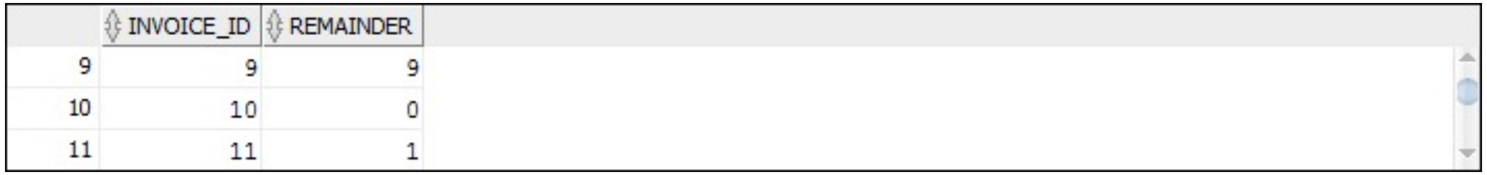
```
SELECT 'Invoice: # '
       || invoice_number
       || ', dated '
       || TO_CHAR(payment_date, 'MM/DD/YYYY')
       || ' for $'
       || TO_CHAR(payment_total)
      AS "Invoice Text"
FROM invoices
```



```
    Invoice Text
  1 Invoice: # QP58872, dated 04/11/2014 for $116.54
  2 Invoice: # Q545443, dated 05/14/2014 for $1083.58
  3 Invoice: # P-0608, dated  for $0
  4 Invoice: # P-0259, dated 05/12/2014 for $26881.4
  5 Invoice: # MAB01489, dated 05/13/2014 for $936.93
```

A SELECT statement that uses the MOD function

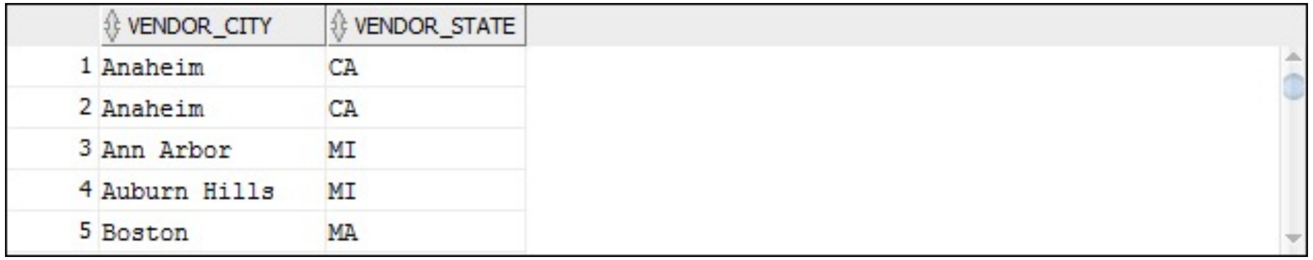
```
SELECT invoice_id,
    MOD(invoice_id, 10) AS Remainder
FROM invoices
ORDER BY invoice_id
```



	INVOICE_ID	REMAINDER
9	9	9
10	10	0
11	11	1

A SELECT statement that returns all rows

```
SELECT vendor_city, vendor_state
FROM vendors
ORDER BY vendor_city
```

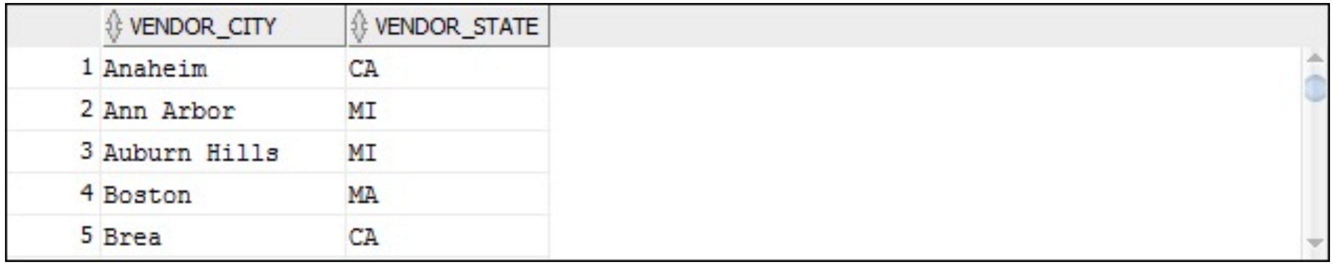


	VENDOR_CITY	VENDOR_STATE
1	Anaheim	CA
2	Anaheim	CA
3	Ann Arbor	MI
4	Auburn Hills	MI
5	Boston	MA

```
(122 rows selected)
```

A SELECT statement with no duplicate rows

```
SELECT DISTINCT vendor_city, vendor_state
FROM vendors
ORDER BY vendor_city
```

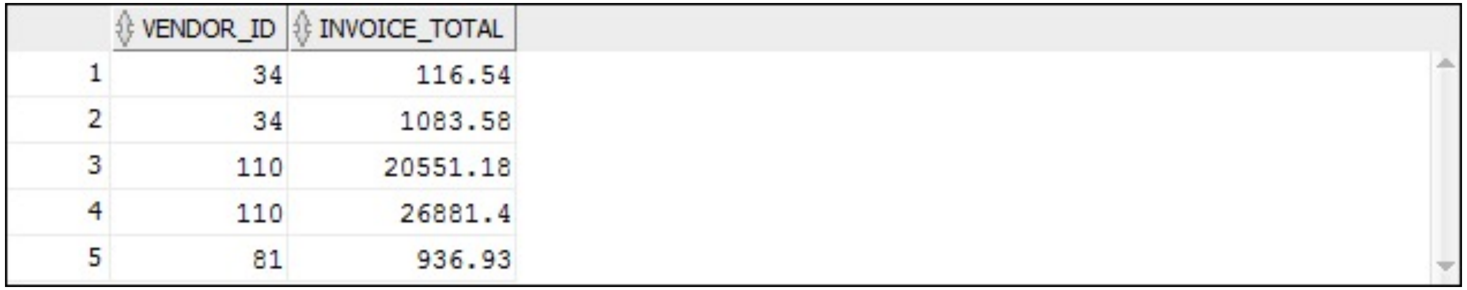


	VENDOR_CITY	VENDOR_STATE
1	Anaheim	CA
2	Ann Arbor	MI
3	Auburn Hills	MI
4	Boston	MA
5	Brea	CA

```
(53 rows selected)
```

A SELECT statement that uses the ROWNUM pseudo column to limit the number of rows

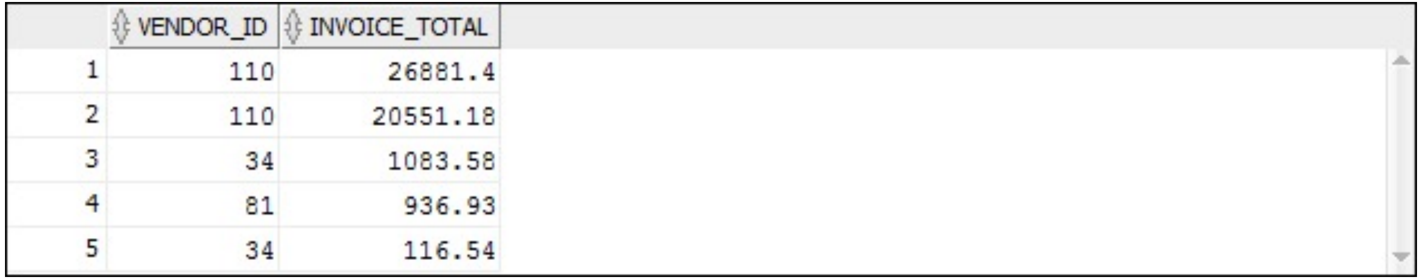
```
SELECT vendor_id, invoice_total
FROM invoices
WHERE ROWNUM <= 5
```



	VENDOR_ID	INVOICE_TOTAL
1	34	116.54
2	34	1083.58
3	110	20551.18
4	110	26881.4
5	81	936.93

A SELECT statement that sorts the result set after the WHERE clause

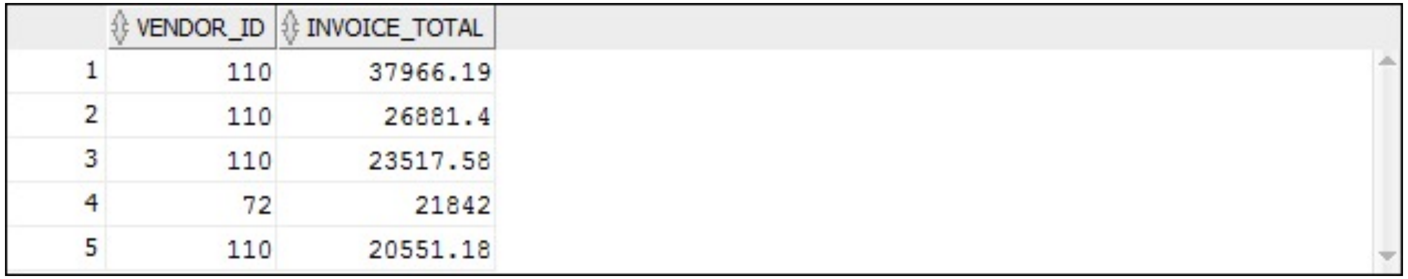
```
SELECT vendor_id, invoice_total
FROM invoices
WHERE ROWNUM <= 5
ORDER BY invoice_total DESC
```



	VENDOR_ID	INVOICE_TOTAL
1	110	26881.4
2	110	20551.18
3	34	1083.58
4	81	936.93
5	34	116.54

A SELECT statement that sorts the result set before the WHERE clause

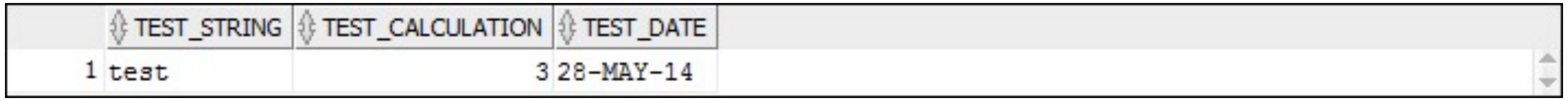
```
SELECT vendor_id, invoice_total
FROM (SELECT * FROM invoices
      ORDER BY invoice_total DESC)
WHERE ROWNUM <= 5
```



	VENDOR_ID	INVOICE_TOTAL
1	110	37966.19
2	110	26881.4
3	110	23517.58
4	72	21842
5	110	20551.18

A SELECT statement that uses the Dual table

```
SELECT 'test'  AS test_string,
       10-7    AS test_calculation,
       SYSDATE AS test_date
FROM Dual
```



	TEST_STRING	TEST_CALCULATION	TEST_DATE
1	test	3	28-MAY-14