SQL-Lab02-DBS201-SELECT

SELECT statement to RETRIEVE DATA

# Introduction to SQL

SQL – Structured Query Language

SQL is a standardized language used to access relational databases. There are some other types of databases such as network and hierarchical, but these mostly died out as relational databases started being introduced through the 1990s.

On this course we are going to learn SQL. With small variations, the SQL used on the iSeries will be similar to that used by Oracle and Microsoft SQL server.

Simplistically speaking there are just a few things you can do with data. You can insert data or store data, you can manipulate data or retrieve it for viewing and you can delete data. We are going to start the SQL by looking how we retrieve and manipulate the data that we retrieve. In later lessons we will learn how to create tables to store the data into the tables, change and delete that data and change and delete tables.

# Retrieve data from the database tables

SELECT statements are used to extract data from tables in the database. The select statement has three actions that it can do on tables.

## 3 ACTIONS ON TABLES

**1 PROJECTION**

**2 SELECTION**

**3 JOIN**

Looking at a simple graphic of a table the 3 actions are as follows

# Projection

The SELECT statement, selects columns of data to retrieve and display

|  |  |  |  |
| --- | --- | --- | --- |
| 11111 | Last name1 | First name1 | Other data about 1 |
| 2222 | Last name2 | First name2 | Other data about 2 |
| 3333 | Last name3 | First name3 | Other data about 3 |
| 4444 | Last name4 | First name4 | Other data about 4 |
| 5555 | Bass name5 | First name5 | Other data about 5 |
| etc |  |  |  |

# Selection

The SELECT statement retrieves rows of data.

|  |  |  |  |
| --- | --- | --- | --- |
| 11111 | Last name1 | First name1 | Other data about 1 |
| 2222 | Last name2 | First name2 | Other data about 2 |
| 3333 | Last name3 | First name3 | Other data about 3 |
| 4444 | Last name4 | First name4 | Other data about 4 |
| 5555 | Bass name5 | First name5 | Other data about 5 |

# Join

The select statement will join columns from two different tables based on a common data type in a column

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 11111 | Last name1 | First name1 | Other data about 1 | 177 |
| 2222 | Last name2 | First name2 | Other data about 2 | 234 |
| 3333 | Last name3 | First name3 | Other data about 3 | 177 |
| 4444 | Last name4 | First name4 | Other data about 4 | 341 |
| 5555 | Bass name5 | First name5 | Other data about 5 | 657 |

|  |  |  |
| --- | --- | --- |
| 177 |  |  |
| 190 |  |  |
| 234 |  |  |

Exercises using SELECT

Have everyone log into Navigator and try out commands

## Basic Format

SELECT --- what you want to retrieve

FROM --- the table where the data can be found

## SELECT TYPES

ALL columns → \*

Specific columns

Any order of columns

Column Headings -- AS

Arithmetic and Relational operator

Arithmetic and Heading

-- operator precedence

-- use of parenthesis 12 \* Salary + 100 vs 12 \* ( salary + 100)

Null values -- null is NOT the same as zero or blank space

Arithmetic expressions containing NULL values

Concatenation -- concatenation LAST||’, ‘||FNAME ← watch spacing

Literal character strings – use of single quotes LNAME || ‘ is an employee in ‘ || DEPARTMENT

Distinct

# RESTRICTING AND SORTING

When retrieving data from the database you may need to do the following:

- Restricts the rows of data that are displayed

- Specify the order which the rows are displayed

# LIMITING ROWS USING A SELECTION

SELECT LASTNAME, SALARY

FROM STUDENT

WHERE SALARY > 10000;

1 Initiate a session to enter SQL commands using your user ID provided for this course

(This means log in)

Q1 This connection can only be done from the labs. True or **False**

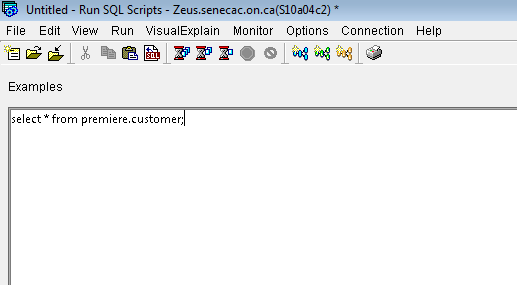
2 Using PREMIERE, expand tables.

Q2 How many tables do you see in the PREMIERE collection that do NOT start with Q →

Tables starting with Q are system tables. **5**

3 At this stage we want to look inside the tables to see the content. To do this go to the lower right pane and select → **Run an SQL script**

You should see a screen with something like this in the left top area but with no words in the example area.



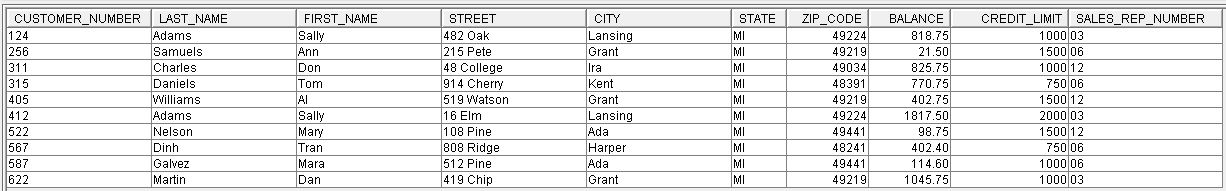
In the “Examples” window ➔type the following:

**SELECT \***

**FROM PREMIERE.CUSTOMER;**

(It could have been put all on 1 line and for something short like this one line is fine. However just as C programming had a better and more readable layout, the above method that splits the line on key words is better to read.)

In the bottom pane (you may have to expand the pane to see it) will be a graphic display of the content of the CUSTOMER table that looks something like the following:



Do the same for the other tables. Look at the data and get an idea what is contained in these very small tables.

4 To demonstrate how to do a better more user friendly title, execute the following

SELECT last\_name “Last Name”

FROM premiere.customer

The results should look like this

You can highlight the results and copy it into the WORD document like this.

There might be a difficulty capturing the title

I shrank the text size to make the box a little smaller. The copy may also display as green like iSQL\*plus

Last Name

Adams

Samuels

Charles

Daniels

Williams

Adams

Nelson

Dinh

Galvez

Martin

5 Do the same as number 4 above, but select Customer Number, First Name, and Balance

Note that the request is for Customer Number (2 words) but you must use the name as stored in the database table. Make the output titles look like Customer Title and First Name. See below.

SELECT customer\_number "Customer Number", first\_name "First Name", balance

FROM premiere.customer

**Show (cut and paste) results here**:

Customer Number First Name BALANCE

|  |  |  |
| --- | --- | --- |
| 124 | Sally | 818.75 |
| 256 | Ann | 21.50 |
| 311 | Don | 825.75 |
| 315 | Tom | 770.75 |
| 405 | Al | 402.75 |
| 412 | Sally | 1817.50 |
| 522 | Mary | 98.75 |
| 567 | Tran | 402.40 |
| 587 | Mara | 114.60 |
| 622 | Dan | 1045.75 |

6 How many rows are in the SALESREP table? → **5**

**SELECT** COUNT(\*) "Total Rows"

**FROM** PREMIERE.SALESREP;

7 What is the name of Salesrep 14? → **Phillips Fred**

**SELECT** LAST\_NAME || FIRST\_NAME

**FROM** PREMIERE.SALESREP

**WHERE** SALES\_REP\_NUMBER = 14;

8 What is the credit limit for Mary Nelson? → **1500**

**SELECT** CREDIT\_LIMIT "Credit Limit"

**FROM** PREMIERE.CUSTOMER

**WHERE** FIRST\_NAME = 'Mary' AND LAST\_NAME = 'Nelson';

9 Enter the following SQL command

SELECT COUNT( \*) “Total Rows”

FROM CUSTOMER;

Did anything unexpected happen? **FILE not found**

Fix the code and cut and paste the result here

**SELECT** COUNT( \*) “Total Rows”

**FROM** PREMIERE.CUSTOMER;

Total Rows

10

10 Enter the following SQL

SELECT COUNT ( \*) AS "TOTAL ROWS"  
FROM PREMIERE.CUSTOMER;

What did the AS do to the output? → **The column heading changed.**

11 Show the SQL code and the result that will show customer number, last name and the result of increasing the balance by 10%

**SELECT** CUSTOMER\_NUMBER "Customer Number", LAST\_NAME "Last Name", BALANCE \* 1.1 AS "Balance"

**FROM** PREMIERE.CUSTOMER;

Customer Number Last Name Balance

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 124 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Adams |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 900.625 |
| 256 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Samuels |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 23.650 |
| 311 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Charles |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 908.325 |
| 315 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Daniels |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 847.825 |
| 405 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Williams |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 443.025 |
| 412 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Adams |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1999.250 |
| 522 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Nelson |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 108.625 |
| 567 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Dinh |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 442.640 |
| 587 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Galvez |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 126.060 |
| 622 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Martin |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1150.325 |

12 Show the SQL code and results that will list customer number, order number and date of the order.

**SELECT** CUSTOMER\_NUMBER "Customer Number", ORDER\_NUMBER "Order Number", ORDER\_DATE "Order Date"

**FROM** PREMIERE.ORDERS;

Customer Number Order Number Order Date

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 124 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12489 |  |  |  |  | 2014-09-02 |
| 311 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12491 |  |  |  |  | 2014-09-02 |
| 315 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12494 |  |  |  |  | 2014-09-04 |
| 256 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12495 |  |  |  |  | 2014-09-04 |
| 522 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12498 |  |  |  |  | 2014-09-05 |
| 124 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12500 |  |  |  |  | 2014-09-05 |
| 522 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 12504 |  |  |  |  | 2014-09-05 |

13 List the orders in the order table. Put the columns in the order of ORDER\_DATE, ORDER\_NUMBER, CUSTOMER\_NUMBER. Also put the date from newest to oldest.

**SELECT** ORDER\_DATE, ORDER\_NUMBER, CUSTOMER\_NUMBER

**FROM** PREMIERE.ORDERS

**ORDER BY** ORDER\_DATE DESC;

14 Produce a list showing Part\_Number, Part\_Description, On\_Hand, and Price sorted by Warehouse and Class.

**SELECT** PART\_NUMBER, PART\_DESCRIPTION, ON\_HAND, PRICE

**FROM** PREMIERE.PART

**ORDER BY** WAREHOUSE, CLASS;

15 Produce a list of part numbers, descriptions and the quantity in stock of the part in the following format

Part Number AX12 is an Iron and there is 3 in stock

Part Number AZ52 is a Dartboard

**SELECT** 'Part Number '|| PART\_NUMBER ||' is a(an) '|| PART\_DESCRIPTION ||' and there is '|| WAREHOUSE || ' in stock' AS “LIST”

**FROM** PREMIERE.PART;

16 Using the orderline table show what part numbers were ordered. (Hint: do not repeat the number if it was ordered more than once.

**SELECT** DISTINCT PART\_NUMBER

**FROM** PREMIERE.ORDERLINE

17 List all salesrep data from all sales people that earn more $3000 commission.

**SELECT** \*

**FROM** PREMIERE.SALESREP

**WHERE** COMMISSION > 3000;

18 List the Part\_Number, Part\_Description, Number\_Ordered and Quoted Price.

**SELECT** PREMIERE.PART.PART\_NUMBER, PREMIERE.PART.PART\_DESCRIPTION, PREMIERE.ORDERLINE.NUMBER\_ORDERED, PREMIERE.ORDERLINE.QUOTED\_PRICE

**FROM** PREMIERE.ORDERLINE, PREMIERE.PART

**WHERE** PREMIERE.ORDERLINE.PART\_NUMBER = PREMIERE.PART.PART\_NUMBER;

19 List the Customer’s Last\_Name and First\_Name followed by the Order\_Number, Part\_Description and Number\_Ordered for all parts that start with the letter C.

**SELECT** PREMIERE.CUSTOMER.LAST\_NAME, PREMIERE.CUSTOMER.FIRST\_NAME, PREMIERE.ORDERS.ORDER\_NUMBER, PREMIERE.PART.PART\_DESCRIPTION, PREMIERE.ORDERLINE.NUMBER\_ORDERED

**FROM** PREMIERE.ORDERLINE, PREMIERE.PART, PREMIERE.ORDERS, PREMIERE.CUSTOMER

**WHERE** PREMIERE.ORDERLINE.PART\_NUMBER = PREMIERE.PART.PART\_NUMBER AND PREMIERE.CUSTOMER.CUSTOMER\_NUMBER = PREMIERE.ORDERS.CUSTOMER\_NUMBER AND PREMIERE.ORDERLINE.ORDER\_NUMBER = PREMIERE.ORDERS.ORDER\_NUMBER;

**SQL-LAB02-DBS201-SELECT Submission**

# Due: Next Week during lab period

Write answer of all 1 to 19 query and show it personally to get marks during lab period.