

0630 | ABAP

SE80 | 0501 | LEFT OUTER JOIN

```
DATA: BEGIN OF LS_STR,
  ZCID TYPE ZCUSTOMERS-ZCID,
  ZFNAME TYPE ZCUSTOMERS-ZFNAME,
  ZSTATE TYPE ZCUSTOMERS-ZSTATE,
  ZCITY TYPE ZCUSTOMERS-ZCITY,
  ZODATE TYPE ZORDERS-ZODATE,
  ZITEM TYPE ZORDERS-ZITEM,
  ZQUANTITY TYPE ZORDERS-ZQUANTITY,
  ZPRICE TYPE ZORDERS-ZPRICE,
END OF LS_STR.
```

DATA LT_LEFT LIKE TABLE OF LS_STR.

DATA LT_INNER LIKE TABLE OF LS_STR.

DATA LT_RIGHT LIKE TABLE OF LS_STR.

**LEFT OUTER JOIN JOIN*

```
SELECT C~ZCID, C~ZFNAME, C~ZSTATE, C~ZCITY,O~ZODATE,O~ZITEM,
O~ZQUANTITY,O~ZPRICE
FROM ZCUSTOMERS AS C LEFT OUTER JOIN ZORDERS AS O
ON C~ZCID = O~ZCID
INTO TABLE @LT_LEFT.
```

Row	ZCID [C11]	ZFNAME [C14]	ZSTATE [C20]	ZCITY [C30]	ZODATE [D00]	ZITEM [C15]	ZQUANTITY [P7 DEC 3]	ZPRICE [P9 DEC 2]
1	10101	John	Washington	Seattle	20110500	Ball	1.000	50.00
2	10101	John	Washington	Seattle	20110701	Life Vest	4.000	120.00
3	10101	John	Washington	Seattle	20110818	Rain Coat	1.000	10.00
4	10101	John	Washington	Seattle	20111220	Wooly Hoop	3.000	14.75
5	10101	John	Washington	Seattle	20120300	Lantern	1.000	10.00
6	10101	John	Washington	Seattle	20120300	Sleeping Bag	2.000	80.70
7	10200	Leroy	Washington	Seattle	20110701	Backboard	1.000	20.00
8	10200	Leroy	Washington	Seattle	20110818	Lantern	2.000	20.00
9	10200	Leroy	Washington	Seattle	20111201	Helmet	1.000	22.00
10	10200	Leroy	Washington	Seattle	20120318	Pocket Knife	1.000	22.50
11	10200	Leroy	Washington	Seattle	20120401	Ear Muffs	1.000	12.00
12	10200	Leroy	Idaho	Idaho	20110700	Parachute	1.000	1200.00
13	10200	Leroy	Idaho	Idaho	20120118	Inflatable Matt	1.000	30.00
14	10315	Lisa	Wisconsin	Duluth	20120202	Compass	1.000	8.00
15	10330	Shawn	Oregon	Cannon Beach	20110630	Huge Stick	1.000	20.00
16	10330	Shawn	Oregon	Cannon Beach	20120101	Flashlight	4.000	20.00
17	10330	Shawn	Oregon	Cannon Beach	20120419	Shovel	1.000	10.75
18	10339	Anthony	Washington	Seattle	20110701	Umbrella	1.000	4.00
19	10410	Mary Ann	South Carolina	Charleston	20111228	Sleeping Bag	1.000	80.20
20	10410	Mary Ann	South Carolina	Charleston	20120100	Umbrella	1.000	100.00

SE80 | 0501 | RIGHT OUTER JOIN

**RIGHT OUTER JOIN*

```
SELECT C~ZCID, C~ZFNAME, C~ZSTATE, C~ZCITY,O~ZODATE,O~ZITEM,
M,O~ZQUANTITY,O~ZPRICE
FROM ZCUSTOMERS AS C RIGHT OUTER JOIN ZORDERS AS O
ON C~ZCID = O~ZCID
INTO TABLE @LT_RIGHT.
```

Row	ZCID [C11]	ZFNAME [C14]	ZSTATE [C20]	ZCITY [C30]	ZODATE [D00]	ZITEM [C15]	ZQUANTITY [P7 DEC 3]	ZPRICE [P9 DEC 2]
1	10101	John	Washington	Seattle	20110500	Ball	1.000	50.00
2	10101	John	Washington	Seattle	20110701	Life Vest	4.000	120.00
3	10101	John	Washington	Seattle	20110818	Rain Coat	1.000	10.00
4	10101	John	Washington	Seattle	20111220	Wooly Hoop	3.000	14.75
5	10101	John	Washington	Seattle	20120300	Lantern	1.000	10.00
6	10101	John	Washington	Seattle	20120300	Sleeping Bag	2.000	80.70
7	10200	Leroy	Washington	Seattle	20110701	Backboard	1.000	20.00
8	10200	Leroy	Washington	Seattle	20110818	Lantern	2.000	20.00
9	10200	Leroy	Washington	Seattle	20111201	Helmet	1.000	22.00
10	10200	Leroy	Washington	Seattle	20120318	Pocket Knife	1.000	22.50
11	10200	Leroy	Washington	Seattle	20120401	Ear Muffs	1.000	12.00
12	10200	Leroy	Idaho	Idaho	20110700	Parachute	1.000	1200.00
13	10200	Leroy	Idaho	Idaho	20120118	Inflatable Matt	1.000	30.00
14	10315	Lisa	Wisconsin	Duluth	20120202	Compass	1.000	8.00
15	10330	Shawn	Oregon	Cannon Beach	20110630	Huge Stick	1.000	20.00
16	10330	Shawn	Oregon	Cannon Beach	20120101	Flashlight	4.000	20.00
17	10330	Shawn	Oregon	Cannon Beach	20120419	Shovel	1.000	10.75
18	10339	Anthony	Washington	Seattle	20110701	Umbrella	1.000	4.00
19	10410	Mary Ann	South Carolina	Charleston	20111228	Sleeping Bag	1.000	80.20
20	10410	Mary Ann	South Carolina	Charleston	20120100	Umbrella	1.000	100.00

SE80 | 0502 | NEW SQL QUERY | @ 사용하기

**변수 앞에 @기호를 사용한다.*

**변수 앞에 @를 사용하지 않는 CLASSICAL OPEN SQL은 폐기*

**@는 필수사항이다*

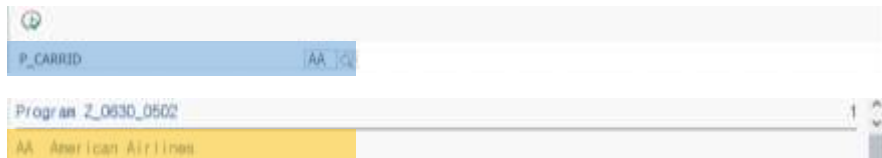
PARAMETERS: P_CARRID TYPE SCARR-CARRID.

```
DATA: BEGIN OF GS_DATA,  
      CARRID TYPE SCARR-CARRID,  
      CARRNAME TYPE SCARR-CARRNAME,  
      END OF GS_DATA.
```

**컬럼 구분을 위해 , 기호를 사용한다.*

```
SELECT SINGLE CARRID, CARRNAME  
      INTO CORRESPONDING FIELDS OF @GS_DATA  
      FROM SCARR  
      WHERE CARRID = @P_CARRID.
```

WRITE:/ GS_DATA-CARRID, GS_DATA-CARRNAME.



SE80 | 0503 | NEW SQL QUERY | 계산식 표현 사용 가능

**계산식 표현이 사용 가능하다.*

**계산식을 이용해서 다양한 값의 변형이 가능하다*

```
TYPES: BEGIN OF T_SFLIGHT,  
      CARRID TYPE SFLIGHT-CARRID,  
      CONNID TYPE SFLIGHT-CONNID,  
      ECON_SEAT TYPE SFLIGHT-SEATSMAX,  
      BUSS_SEAT TYPE SFLIGHT-SEATSMAX_B,  
      END OF T_SFLIGHT.
```

DATA: GT_ITAB TYPE TABLE OF T_SFLIGHT.

DATA: GV_SALE TYPE P VALUE '0.1' DECIMALS 1.

DATA(GV_ADD) = 20.

**AGGREGATE 함수의 기능 확장 AVG MAX MIN SUM COUNT 내에서 계산식
이 가능하다*

```
SELECT CARRID, CONNID, SEATSMAX + @GV_ADD AS ECON_SEAT,  
      ( SEATSMAX_B + ( SEATSMAX_B * @GV_SALE ) ) AS BUSS_  
SEAT  
      FROM SFLIGHT  
      INTO CORRESPONDING FIELDS OF TABLE @GT_ITAB  
      WHERE CARRID = 'AZ' AND CONNID = '788'.
```

CL_DEMO_OUTPUT=>DISPLAY(GT_ITAB).

GT_ITAB

CARRID	CONNID	ECON_SEAT	BUSS_SEAT
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33
AZ	0788	495	33

SE80 | 0504 | NEW SQL QUERY | CAST 옵션 사용

**CAST 옵션을 사용하여 컬럼 타입을 변환할 수 있다.*

TYPES : BEGIN OF T_STR,

CARRID TYPE SFLIGHT-CARRID,

CONNID TYPE SFLIGHT-CONNID,

OCCUP TYPE F,

END OF T_STR.

DATA: GT_ITAB TYPE TABLE OF T_STR.

SELECT CARRID, CONNID, CAST(SEATSOCC AS FLTP) / CAST(SEAT
SMAX AS FLTP) AS OCCUP

INTO CORRESPONDING FIELDS OF TABLE @GT_ITAB

FROM SFLIGHT

WHERE SEATSOCC > 0.

CL_DEMO_OUTPUT=>DISPLAY(GT_ITAB).

GT_ITAB

CARRID	CONNID	OCCUP
AA	0017	1.0E0
AA	0017	1.0E0
AA	0017	9.948051948051948E-1
AA	0017	9.7922077922077921E-1
AA	0017	1.0E0
AA	0017	1.0E0
AA	0017	9.8701298701298701E-1
AA	0017	1.0E0
AA	0017	1.8701298701298702E-1
AA	0017	1.8961038961038962E-1
AA	0017	1.7662337662337663E-1
AA	0017	9.0909090909090912E-2
AA	0017	5.1948051948051951E-2
AA	0064	1.0E0
AA	0064	1.0E0
AA	0064	1.0E0
AA	0064	1.0E0
AA	0064	1.0E0
AA	0064	9.8181818181818181E-1
AA	0064	9.7272727272727277E-1
AA	0064	6.6060606060606064E-1

SE80 | 0505 | NEW SQL QUERY | && 사용하여 문자열 연결

**&&을 사용하여 문자열을 연결할 수 있다.*

**이때 연결된 문자열의 길이는 255자를 넘을 수 없다.*

TYPES: BEGIN OF T_STR,

IDNAME TYPE C LENGTH 40,

END OF T_STR.

DATA: GT_ITAB TYPE TABLE OF T_STR.

SELECT CARRID && '-' && CARRNAME AS IDNAME

FROM SCARR

INTO CORRESPONDING FIELDS OF TABLE @GT_ITAB.

CL_DEMO_OUTPUT=>DISPLAY(GT_ITAB).

GT_ITAB

IDNAME

AA-American Airlines

AC-Air Canada

AF-Air France

AZ-Alitalia

BA-British Airways

FJ-Air Pacific

CO-Continental Airlines

DL-Delta Airlines

AB-Air Berlin

LH-Lufthansa

NG-Lauda Air

JL-Japan Airlines

NW-Northwest Airlines

QF-Qantas Airways

SA-South African Air.

SQ-Singapore Airlines

SR-Swiss

UA-United Airlines

KO-Air Korea

SE80 | 0506 | NEW SQL QUERY | CASE 구문 이용

**CASE 구문을 이용하여 컬럼 값에 따라서 분기문으로 처리할 수 있다.*

```
TYPES: BEGIN OF T_STR,  
        CARRID TYPE SCARR-CARRID,  
        IDNAME TYPE C LENGTH 40,  
END OF T_STR.  
  
DATA: GT_ITAB TYPE TABLE OF T_STR.  
  
DATA ELSE TYPE C LENGTH 10 VALUE 'NOT AVAILABLE'.  
  
SELECT CARRID,  
        CASE CARRID  
            WHEN 'AC' THEN ( CARRID && '-' && CARRNAME )  
            WHEN 'AZ' THEN ( 'AVAILABLE' )  
            ELSE @ELSE  
        END AS IDNAME  
FROM SCARR  
INTO TABLE @GT_ITAB.  
  
CL_DEMO_OUTPUT=>DISPLAY( GT_ITAB ).
```

GT_ITAB

CARRID	IDNAME
AA	NOT AVAILA
AC	AC-Air Canada
AF	NOT AVAILA
AZ	AVAILABLE
BA	NOT AVAILA
FJ	NOT AVAILA
CO	NOT AVAILA
DL	NOT AVAILA
AB	NOT AVAILA
LH	NOT AVAILA
NG	NOT AVAILA
JL	NOT AVAILA
NW	NOT AVAILA
QF	NOT AVAILA
SA	NOT AVAILA
SQ	NOT AVAILA
SR	NOT AVAILA
UA	NOT AVAILA
KO	NOT AVAILA

SE80 | 0507 | NEW SQL QUERY | COALESCE 사용하기

**COALESCE 를 사용하여 NULL을 대체*

**COALESCE (ARG1, ARG2)*

**ABAP에서 DATA 선언 시 기본으로 INITIAL VALUE로 지정된다.*

**NULL은 사용되지 않는다고 간주해도 무방하다.*

**COALESCE 구문은 OUTER JOIN을 할 경우 값이 없는 경우에 활용할 수 있다.*

```
TYPES: BEGIN OF T_STR,  
        CARRID TYPE SCARR-CARRID,  
        PRICE TYPE I,  
END OF T_STR.
```

```
DATA: GT_ITAB TYPE TABLE OF T_STR.
```

**NULL 일 경우 1로 표시하자*

```
SELECT SCARR~CARRID, COALESCE( PRICE, 1 ) AS PRICE  
FROM SCARR LEFT OUTER JOIN SFLIGHT  
ON SCARR~CARRID = SFLIGHT~CARRID  
INTO CORRESPONDING FIELDS OF TABLE @GT_ITAB  
WHERE SCARR~CARRID = 'KO'.
```

```
CL_DEMO_OUTPUT=>DISPLAY( GT_ITAB ).
```

GT_ITAB

CARRID	PRICE
KO	1

SE80 | 0508 | NEW SQL QUERY | CONSTANT VALUE

**CONSTANT VALUE 사용*

**조건에 맞는 데이터가 존재하는지 체크 할 경우 유용하게 사용할 수 있다.*

```
DATA: GV_EXIST TYPE C.
```

```
SELECT SINGLE @ABAP_TRUE  
FROM SCARR  
WHERE CARRID = 'AC'  
INTO @GV_EXIST.
```

```
IF GV_EXIST = ABAP_TRUE.
```

```
CL_DEMO_OUTPUT=>DISPLAY( | DATA EXISTS IN SCARR | ).  
ELSE.
```

```
CL_DEMO_OUTPUT=>DISPLAY( | DATA DOES NOT EXIST IN SCARR  
| ).  
ENDIF.
```



SE80 | 0509 | NEW SQL QUERY | RIGH OUTER JOIN

**RIGHT OUTER JOIN 지원*

**LEFT / RIGHT OUTER JOIN 이 모두 지원된다.*

**WHERE 조건에 OUTER JOIN으로 사용된 칼럼이 조건 채 포함될 수 있다.*

```
TYPES: BEGIN OF T_STR,  
        CARRID TYPE SCARR~CARRID,  
        PRICE TYPE I,  
END OF T_STR.
```

```
DATA: GT_ITAB TYPE TABLE OF T_STR.
```

```
SELECT SCARR~CARRID, COALESCE( PRICE, 1 ) AS PRICE  
FROM SFLIGHT RIGHT OUTER JOIN SCARR  
ON SFLIGHT~CARRID = SCARR~CARRID  
INTO CORRESPONDING FIELDS OF TABLE @GT_ITAB  
WHERE SCARR~CARRID = 'KO'.
```

```
CL_DEMO_OUTPUT=>DISPLAY( GT_ITAB ).
```

GT_ITAB

CARRID	PRICE
KO	1

SE80 | 0510 | NEW SQL QUERY | JOIN에 사용하는 ON 조건 사용

**JOIN에 사용되는 ON 조건 기능 확장 BETWEEN <> 사용가능*

```
TYPES: BEGIN OF T_STR,  
        CARRID TYPE SCARR~CARRID,  
        PRICE TYPE I,  
END OF T_STR.
```

```
DATA: GT_ITAB TYPE TABLE OF T_STR.
```

```
SELECT A~CARRID, PRICE  
FROM SFLIGHT AS A INNER JOIN SCARR AS B  
ON A~CARRID = B~CARRID  
AND A~CARRID LIKE 'A%'  
INTO CORRESPONDING FIELDS OF TABLE @GT_ITAB.
```

```
CL_DEMO_OUTPUT=>DISPLAY( GT_ITAB ).
```

GT_ITAB

CARRID	PRICE
AA	422
AA	422
AA	422
AA	422
AA	422

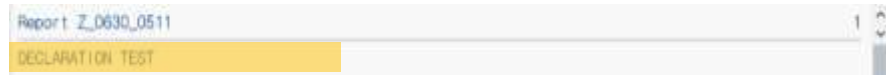
SE80 | 0511 | NEW SQL QUERY | DECLARATION EXPRESSION

**DECLARATION EXPRESSION은 변수를 선언하면서 동시에 값을 할당할 수 있다.*

**DATA(VAR)*

DATA(GV_VAR) = 'DECLARATION TEST'.

WRITE: GV_VAR.



SE80 | 0512 | 실습 예제를 확인해보자

**284 144 2020.01.09*

```
TYPES: BEGIN OF GTY_S_BOOKING,  
        CARRID TYPE SBOOK-CARRID,  
        CONNID TYPE SBOOK-CONNID,  
        FLDATE TYPE SBOOK-FLDATE,  
        BOOKID TYPE SBOOK-BOOKID,  
        CUSTOMID TYPE SBOOK-CUSTOMID,  
        AGENCYNUM TYPE SBOOK-AGENCYNUM,  
        CARRNAME TYPE SCARR-CARRNAME,  
        AGENCYNAME TYPE STRAVELAG-NAME,  
        AGENCYCITY TYPE STRAVELAG-CITY,  
END OF GTY_S_BOOKING.
```

TYPES: GTY_T_BOOKINGS TYPE STANDARD TABLE OF GTY_S_BOOKIN

G

WITH NON-UNIQUE KEY

CARRID CONNID FLDATE BOOKID.

DATA:

```
GT_BOOKINGS TYPE GTY_T_BOOKINGS,  
GS_BOOKING TYPE GTY_S_BOOKING.
```

DATA:

```
GV_CUSTNAME TYPE SCUSTOM-NAME.  
*   GV_CARRNAME TYPE SCARR-CARRNAME,  
*   GV_AGENCYNAME TYPE STRAVELAG-NAME,  
*   GV_AGENCYCITY TYPE STRAVELAG-CITY.
```

FIELD-SYMBOLS :

⟨FS_BOOKING⟩ LIKE LINE OF GT_BOOKINGS.

SELECT-OPTIONS :

```
SO_AGY FOR GS_BOOKING-AGENCYNUM DEFAULT '100',  
SO_CUS FOR GS_BOOKING-CUSTOMID,  
SO_FLD FOR GS_BOOKING-FLDATE.
```

START-OF-SELECTION.

```
SELECT B~CARRID B~CONNID B~FLDATE B~BOOKID  
        B~CUSTOMID B~AGENCYNUM
```



```

C~CARRNAME A~NAME A~CITY
FROM SBOOK AS B INNER JOIN SCARR AS C
ON B~CARRID = C~CARRID
LEFT OUTER JOIN STRAVELAG AS A
      ON B~AGENCYNUM = A~AGENCYNUM
INTO TABLE GT_BOOKINGS
WHERE B~AGENCYNUM IN SO_AGY AND
      B~CUSTOMID IN SO_CUS AND
      B~FLDATE IN SO_FLD AND
      CANCELLED <> 'X'.

```

LOOP AT GT_BOOKINGS ASSIGNING <FS_BOOKING>.

**SCUSTOM IS BUFFERED – NO NEDD FOR OPTIMIZATIONS*

```

SELECT SINGLE NAME FROM SCUSTOM INTO GV_CUSTNAME
WHERE ID = <FS_BOOKING>-CUSTOMID.

```

** SELECT SINGLE CARRNAME FROM SCARR*

** INTO GV_CARRNAME*

** WHERE CARRID = <fs.booking>-carrid.*

**SELECT SINGLE name city FROM stravelag.*

** INTO (gv_agencyname, gv_agencycity)*

** WHERE agnecynum = <fs.booking>-agencynum.*

```

WRITE:/ <FS_BOOKING>-CARRID,
*      gv_carrname,
      <FS_BOOKING>-CARRNAME,
      <FS_BOOKING>-CONNID,
      <FS_BOOKING>-FLDATE,
      <FS_BOOKING>-BOOKID,
      GV_CUSTNAME,
*      gv_agencyname,
*      gv_agencycity,
      <FS_BOOKING>-AGENCYNAME,
      <FS_BOOKING>-AGENCYCITY.
ENDLOOP.

```

SO_AGY	284	to		
SO_CUS	144	to		
SO_FLD	2020.01.09	to		

Report Z_0630_0512		1
AA American Airlines	0017 2020.01.09 00000076 Pyramid Systems	
Rainy, Stormy, Cloudy	Stuttgart	