Let's start with a quiz

The right choice is…

Assign datasets to SASUSER library and practice the quiz

- Find the datasets on Blackboard under Data Files.
- Download and assign these to the SASUSER library that belongs to SAS.
- How many ways can you use to accomplish this task?
- Practice the quiz to confirm your answer.

Create tables in SAS

- Create a table from an existing table(s) and/or view(s). This is pretty common in PROC SQL. However, there is no guarantee that the table created has integrity constraints.
- Create a table that has integrity constraints
  - With PROC DATASETS: Constraints can be only assigned to an existing table.
  - With PROC SQL: Constraints can be assigned either as a new table is created or as an existing table is modified. This approach is the same as we have introduced earlier in general SQL, e.g., Oracle SQL*PLUS.

Create a table from an existing table(s)

- Create a table from a query result (which we covered earlier).

  CREATE TABLE Table_Name **AS**

  SELECT…**FROM**…

- Create a new empty table with the same columns and attributes as an existing table by using

  CREATE TABLE…LIKE…

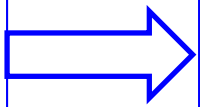
  (Oracle does not support this)

- Create a new empty table that only contains a subset of columns of an existing table by using **CREATE TABLE…(DROP|KEEP=…) LIKE…**

CREATE TABLE…LIKE…

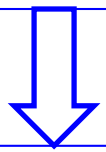
```
proc sql;
        CREATE TABLE work.flightdelays2
                LIKE sasuser.flightdelays;
quit;
```

```
proc sql;
  describe table
        work.flightdelays2;
quit;
```



```
create table WORK.FLIGHTDELAYS2(
bufsize=8192 )
  (
   Date num format=DATE9. informat=DATE9.,
   FlightNumber    char(3),
   Origin          char(3),
   Destination     char(3),
   DelayCategory   char(15),
   DestinationType char(15),
   DayOfWeek       num,
   Delay           num
  );
```

```
proc sql;
select * from work.flightdelays2;
quit;
```



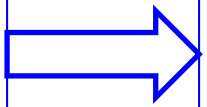
```
NOTE: No rows were selected
```

CREATE TABLE…(DROP|KEEP=…) LIKE…

```
proc sql;
        CREATE TABLE work.flightdelays3
          (drop=delaycategory destinationtype)
            LIKE sasuser.flightdelays;
quit;
```

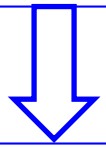
Note: separated by a space

```
proc sql;
  describe table
       work.flightdelays3;
quit;
```



```
create table WORK.FLIGHTDELAYS3(
bufsize=4096 )
  (
   Date num format=DATE9. informat=DATE9.,
   FlightNumber    char(3),
   Origin          char(3),
   Destination     char(3),
   DayOfWeek       num,
   Delay           num
  );
```

```
proc sql;
select * from work.flightdelays3;
quit;
```



NOTE: No rows were selected

Note: DROP= and KEEP= options are not part of ANSI and are unique to SAS PROC SQL

Note the difference

In PROC SQL	In SQL*PLUS
proc sql; describe **table** flightdelays3; quit;	describe flightdelays3

Practice

- Use CREATE TABLE…(KEEP=…) LIKE…to create a new empty table called Employee_payroll_T1 in the Work library based on the first four columns of the Employee_payroll in the SASUSER library.
- Create a new table called Employee_payroll_T2, which is identical to Employee_payroll_T1, by using a query.

Common comparison operators

Mnemonic	Symbol	Definition
LT	<	Less than
GT	>	Greater than
EQ	=	Equal to
LE	<=	Less than or equal to
GE	>=	Greater than or equal to
NE	< >	Not equal to
	^=	Not equal to (ASCII)

You can use the mnemonic or the symbols in PROC SQL

Logical operators

Mnemonic	Symbol	Definition
OR	|	or, either
AND	&	and, both
NOT	^	not, negation (ASCII)

You can use the mnemonic or the symbols in PROC SQL

The concatenation operator || (Review)

It joins two strings into one string. For example,

```
Name = FirstName || ' ' || LastName;

Name = 'John' || ' ' || 'Smith';
```

Common WHERE clause operators with examples

Operator	Example
IN	`where JobCategory in ('PT','NA','FA')`
CONTAINS or ?	`where word ? 'LAM'`
IS NULL or IS MISSING	`where Product_ID is missing`
BETWEEN – AND	`where Salary between 70000 and 80000`
SOUNDS LIKE (=*)	`where LastName =* 'SMITH'`
LIKE using % or _	`where Employee_Name like 'H%'` `where JobCategory like '__1'`

The CONTAINS or ? operator

Example:

```
proc sql outobs=10;
select name
        from sasuser.frequentflyers
        where name ? 'ER';
```

Name
COOPER, LESLIE
COOPER, ANTHONY
COOK, JENNIFER
FOSTER, GERALD
BRADLEY, JEREMY
BURKE, CHRISTOPHER
AVERY, JERRY
EDGERTON, JOSHUA
SAYERS, RANDY
WANG, CHRISTOPHER

The Sounds-Like (=*) operator

Example:

```
proc sql ;
select customer_id, country, gender,
customer_name
  from sasuser.customer
  where customer_firstname =* 'Jim';
quit;
```

=

```
proc sql ;
select customer_id, country, gender,
customer_name
  from sasuser.customer
  where SOUNDEX(customer_firstname)
   = SOUNDEX('Jim');
quit;
```

Customer ID	Customer Country	Customer Gender	Customer Name
17	US	M	Jimmie Evans

Note: In Oracle, you can use either

```
where customer_firstname SOUNDS LIKE 'Jim'
```

Or

```
where SOUNDEX(customer_firstname) = SOUNDEX('Jim')
```

A Review of some SAS character functions

- SCAN()
  - Returns a word from a character value
- SUBSTR()
  - Extract a substring or replaces character values
- TRANWRD()
  - Replaces or removes all occurrences of a pattern of characters within a character string

The SCAN() function

Syntax: SCAN(argument,n,delimiters)

where

argument specifies the character value, variable or expression to scan

n specifies which word to return; if the value of n is negative, the SCAN() function selects the word in the character string starting from the end of the string.

delimiters are special characters that must be enclosed in quotation marks. A blank and a comma are default delimiters.

Example:

```
SCAN('Ithaca, NY, 14853', -3, ' , ')
```

What is the result that the SCAN() function will return?

The SUBSTR() function

- **SUBSTR**(*argument,position,<n>*)

  where

  argument specifies the character value, variable or expression to scan.

  position is the character position to start from.

  n specifies the number of characters to extract. If *n* is omitted, all remaining characters are included in the substring.

- When the function is on the **right side** of an assignment statement, the function returns the requested string.

Example:

```
City = SUBSTR('Ithaca, NY, 14853', 1, 6);
```

What will the SUBSTR() function return?

The SUBSTR() function

The SUBSTR() function can be used to replace the character values if you place the function on the **left side** of an assignment statement.

Example:

```
new_string = 'Ithaca, NY, 14853';
SUBSTR(new_string, 13, 5) = '14850'
```

What is the value of new_string after you execute the above statement?

The TRANWRD() function

TRANWRD(*source,target,replacement*)

where

source specifies the source string that you want to update

target specifies the string that SAS searches for in *source*

replacement specifies the string that replaces *target*.

Example:

```
phonenumber=TRANWRD(phonenumber, '607', '608');
```

What happens to the values of the phonenumber variable?

Update values in existing table rows

The syntax:

```
proc sql;
  update table_name
    set column =…
    where…;
```

Example:

```
proc sql;
  update work.payrollmaster_new
    set salary=salary*1.05
    where jobcode like '__1';
```

Practice: using PROC SQL