

STAT 2005 – PROGRAMMING LANGUAGES FOR STATISTICS
TUTORIAL 10 CONTROLLING OUTPUT CONTENTS
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1 OUTPUT

OUTPUT writes observations to a SAS data set; PUT writes variable values or text strings to an external file or the SAS log.

For OUTPUT, the remaining statements in the DATA step will still be executed.

```
Data test1;
X = 1;
output;
Y = 1;
run;
```

Does the data test1 contain the observation of Y and just not display it?

```
Data test2;
set test1;
output;
run;
```

And we have the result

```
      X  Y
1     1  .
```

which means that the data set test1 actually does not contain the observation of Y. So, is $Y = 1$ this command executed? In fact, OUTPUT is not a option for display, it is a option for storage. Unlike PUT, OUTPUT chooses which observations to be sent to the SAS dataset. Therefore, $Y = 1$ is executed but not sent to the dataset. The test1 dataset will not contain the observation of Y.

How about changing the values of existing variables?

```
Data test3;
X = 1;
output;
X = 2;
run;
```

The result will still be

```
      X
1     1
```

It means that even if you try to change the existing variable value, the observation value will still be the value before the OUPUT.

What if we add a OUTPUT in the final

```
Data test5;
X = 1;
output;
X = 2;
output;
run;
```

The result will be

	X
1	1
2	2

Because we actually send two observations to the data set.

Another example:

```
Data test5;
X = 1;
output;
output;
run;
```

The result will be

	X
1	1
2	1

If we OUPUT different variables:

```
Data test6;
X = 1;
output;
Y = 2;
output;
run;
```

The result will be

	X	Y
1	1	.
2	1	2

In this example, we send the observations twice: the first is $X = 1$, the second is $X = 1; Y=2$. Therefore, there will be total two observations and the first observation for Y is missing.

Remark 1.1. Be sure that you have not sent the same observations several times.

```
DATA MFSalary;
INFILE 'D:\SAS\SALARY.TXT' ;
INPUT NAME $ AGE 2. SEX $ SALARY;
IF SEX = 'M' THEN OUTPUT;
IF SEX = 'F' AND SALARY > 11000 THEN OUTPUT;
RUN;
```

Although there are two OUPUT in this example, the two commands do not execute in a same observation.

Remark 1.2. [reference](#)

2 Assignment commands not Executed

Assignment commands which are not executed may also have effects.

```
DATA test7;
X = 1;
IF X = 2 then Z = 0;
run;
```

It will have the result

X	Z
1	.

It means that although $Z=0$ is not executed, the variable name will still be able to appear in the dataset even if the observation of Z is missing.

It is quite unlike R, if some assignments are not executed, the variables will not be defined.

Another example:

```
DATA test7;
Input X @@;
IF X = 1 then Z = 'ss';
IF X = 2 then Z = 'sss';
cards;
1 2 2 1
run;
```

As you have learned in class, all of z will be truncated to be 'ss' instead of 'sss'. And changing the order of IF is one of the solutions.

```
DATA test7;
Input X @@;
IF X = 2 then Z = 'sss';
IF X = 1 then Z = 'ss';
cards;
1 2 2 1
run;
```

But look at this example carefully, we actually execute the command $Z = 'ss'$ first, because the first observation of X is 1 instead of 2. However, SAS will define the length of Z is 3 first according the position of commands line. ($Z = 'sss'$ is in the front of $Z = 'ss'$) There should be some global settings before reading observations and running the commands.

3 Exercise

How to combine two data sets and sort it by , add indicator.

4 A brief review of previous tutorials

1. Data objects: vector, matrix, array ,list,dataframe, factor
2. Generate random numbers from specified distributions; **apply**

3. Statistical graphics; some settings for `plot`
4. `function` definition; three dots argument; attributes(optional)
5. Three ways for debugging; `outer`; Objects and Classes in R(optional)
6. Matrix calculation; Mathematical calculation: integration, derivatives, optimization; `dplyr`(optional)
7. Variable Name and Data Types in SAS; `ggplot2`(optional)
8. Application for the SAS on demand for academics; Three ways for data input
9. Character functions; Variable List

Remark 4.1. The contents in tutorials are not exactly the same with exam contents, please also refer to the course slides and what the teacher said in class.

Thanks for coming.