

# SAS Goes Spreadsheet

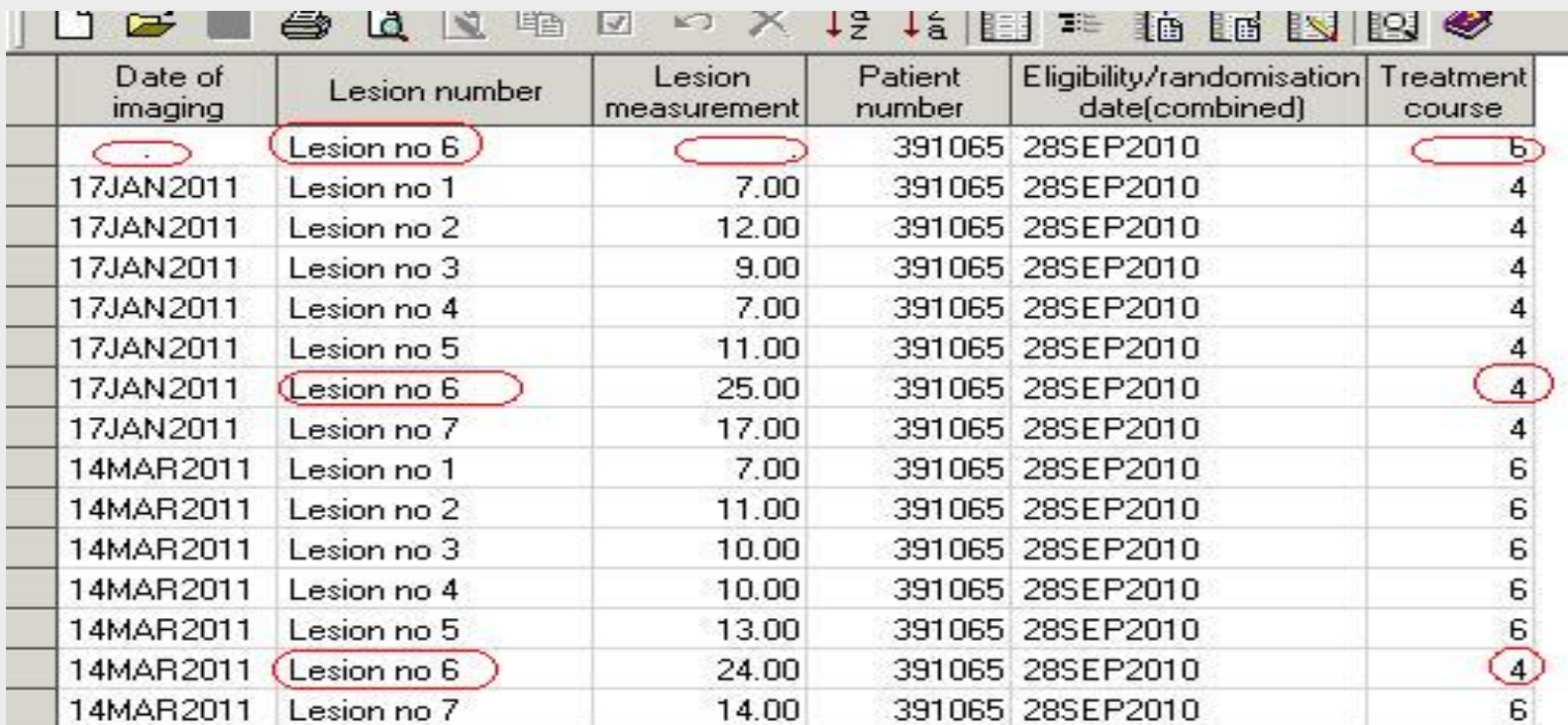
Accessing SAS Data in 2D

It is very common to organize data in 2 dimensions

- because a monitor has 2 dimensions
- because a simple sheet of paper has 2 dimensions (like shown below)
- because any table has 2 dimensions

|                                                                                                                                                                                                                                                                                                    |                                                                                                     |                                                                                                                               |                                              |                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------|
| <p>super after Cadric E...<br/>                 match - Un...<br/>                 Row 18: skipping Snape lessons - Harry really in day house - he cry. Over...<br/>                 Rita - ...<br/>                 Shape lesson<br/>                 Hogsmade / Xmas shopping they meet Rita</p> | <p>Nagini got in, Vol has confirmation of Bode's story - only he + Harry can touch the prophesy</p> | <p>Cho kiss? Ginny...<br/>                 Ron + rest of<br/>                 We called in to see told of father's injury</p> | <p>Reactions - another meeting? overview</p> | <p>How about Harry not going</p>               |
| <p>Rita information 'Missy' shipkiss</p>                                                                                                                                                                                                                                                           | <p>Harry now avoiding Cho a bit - Ginny + S.O. else?</p>                                            | <p>Glim + Dad</p>                                                                                                             | <p>O of P</p>                                | <p>Another lesson</p>                          |
| <p>St. Mungo's visit Xmas Eve - see Bode (Machair visit) - see Lockhart - see Mr. Weasley <u>Neville</u></p>                                                                                                                                                                                       | <p>NOW VOL IS ACTIVELY TRYING TO GET HARRY TO HQP - very vivid - could see him</p>                  | <p>around</p>                                                                                                                 |                                              |                                                |
| <p>Bode dead - HQP again</p>                                                                                                                                                                                                                                                                       | <p>Harry + Ginny + Ron still maps</p>                                                               | <p>Shins here Big reunion</p>                                                                                                 |                                              |                                                |
| <p>Harry misses match v. Hufflepuff Order of Phoenix now suspected</p>                                                                                                                                                                                                                             | <p>fighting strong not</p>                                                                          | <p>to keep</p>                                                                                                                | <p>O of P big meeting</p>                    | <p>Shape lesson H can mention HQP Prophecy</p> |

The following table shows some data issues, but ....  
 Don't show what's wrong in one observation  
 The issue is clear when access all affected observation



|  | Date of imaging | Lesion number | Lesion measurement | Patient number | Eligibility/randomisation date(combined) | Treatment course |
|--|-----------------|---------------|--------------------|----------------|------------------------------------------|------------------|
|  | .               | Lesion no 6   |                    | 391065         | 28SEP2010                                | 6                |
|  | 17JAN2011       | Lesion no 1   | 7.00               | 391065         | 28SEP2010                                | 4                |
|  | 17JAN2011       | Lesion no 2   | 12.00              | 391065         | 28SEP2010                                | 4                |
|  | 17JAN2011       | Lesion no 3   | 9.00               | 391065         | 28SEP2010                                | 4                |
|  | 17JAN2011       | Lesion no 4   | 7.00               | 391065         | 28SEP2010                                | 4                |
|  | 17JAN2011       | Lesion no 5   | 11.00              | 391065         | 28SEP2010                                | 4                |
|  | 17JAN2011       | Lesion no 6   | 25.00              | 391065         | 28SEP2010                                | 4                |
|  | 17JAN2011       | Lesion no 7   | 17.00              | 391065         | 28SEP2010                                | 4                |
|  | 14MAR2011       | Lesion no 1   | 7.00               | 391065         | 28SEP2010                                | 6                |
|  | 14MAR2011       | Lesion no 2   | 11.00              | 391065         | 28SEP2010                                | 6                |
|  | 14MAR2011       | Lesion no 3   | 10.00              | 391065         | 28SEP2010                                | 6                |
|  | 14MAR2011       | Lesion no 4   | 10.00              | 391065         | 28SEP2010                                | 6                |
|  | 14MAR2011       | Lesion no 5   | 13.00              | 391065         | 28SEP2010                                | 6                |
|  | 14MAR2011       | Lesion no 6   | 24.00              | 391065         | 28SEP2010                                | 4                |
|  | 14MAR2011       | Lesion no 7   | 14.00              | 391065         | 28SEP2010                                | 6                |

The following table shows some data issues, but ....  
2 images of lesion 6 in cycle 4, cycle 6 has all missing  
False reported image.

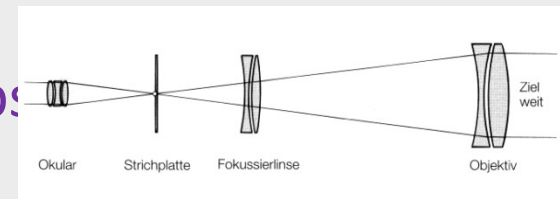
| Date of imaging | Lesion number | Lesion measurement | Patient number | Eligibility/randomisation date(combined) | Treatment course |
|-----------------|---------------|--------------------|----------------|------------------------------------------|------------------|
| .               | Lesion no 6   |                    | 391065         | 28SEP2010                                | 6                |
| 17JAN2011       | Lesion no 1   | 7.00               | 391065         | 28SEP2010                                | 4                |
| 17JAN2011       | Lesion no 2   | 12.00              | 391065         | 28SEP2010                                | 4                |
| 17JAN2011       | Lesion no 3   | 9.00               | 391065         | 28SEP2010                                | 4                |
| 17JAN2011       | Lesion no 4   | 7.00               | 391065         | 28SEP2010                                | 4                |
| 17JAN2011       | Lesion no 5   | 11.00              | 391065         | 28SEP2010                                | 4                |
| 17JAN2011       | Lesion no 6   | 25.00              | 391065         | 28SEP2010                                | 4                |
| 17JAN2011       | Lesion no 7   | 17.00              | 391065         | 28SEP2010                                | 4                |
| 14MAR2011       | Lesion no 1   | 7.00               | 391065         | 28SEP2010                                | 6                |
| 14MAR2011       | Lesion no 2   | 11.00              | 391065         | 28SEP2010                                | 6                |
| 14MAR2011       | Lesion no 3   | 10.00              | 391065         | 28SEP2010                                | 6                |
| 14MAR2011       | Lesion no 4   | 10.00              | 391065         | 28SEP2010                                | 6                |
| 14MAR2011       | Lesion no 5   | 13.00              | 391065         | 28SEP2010                                | 6                |
| 14MAR2011       | Lesion no 6   | 24.00              | 391065         | 28SEP2010                                | 4                |
| 14MAR2011       | Lesion no 7   | 14.00              | 391065         | 28SEP2010                                | 6                |

In a data step you have one observation in access at a time

- Only one dimension of a table in access at a time.
- Sequential access to data.

To overcome this you need to know how to

- Explicit control the dataset loop, the set and the output statement
- How an array works, “standard” and `_temporary_` array.
- Set up a second dimension with a DOW-Loop
- Consider macros to aid with DOW-Loops



Let ‘s have a look on this topics

# SAS Goes Spreadsheet – Accessing SAS Data in 2D

## Explicit control of the dataset loop

**data two;**

do until fin;                      implicit output

set one ( end = fin );            implicit loop

< Your SAS commands >

output;                            explicit output

end;                                explicit loop

**run;**

“set” and “run” statement define a loop.

Reaching the “run” before last observation is read repeats the loop

Without the output statement you’ll have one observation as result

## Reading in complete by groups in a loop

```
data two;
```

```
do until fin or last.byvar;
```

```
    set one;
```

```
    by byvar;
```

```
    ....
```

```
    output;
```

```
end;
```

```
run;
```

- As many repeats as there are observations in a by group
- As many calls of the loops as there are by groups

## How an array works

**Non temporary arrays are defined as reference to variables (pointer)**

- **New observation -> new values accessed by the array.**
- **Links indices to variables**

**Example:**

**array myarray \$ var1 var2 var3 var4;**

**myarray[ 3 ] is a link to var3**

**myarray[ 2 ] = "Test" ;**

**put var2; \*\*\* will show the word Test \*\*\*;**

## How an array works

**Temporary arrays can be seen as continuous piece of memory**

- **New observation -> old values accessed by the array.**
- **Links indices to values.**
- **It 's up to you to define how the values are filled in the array.**
- **Can be easily filled with help of non-temp. arrays**

## How an array works

**Temporary arrays can be seen as continuous piece of memory**

**Non temporary arrays are defined as reference to variables (pointer)**

**Example:**

```
array myarray $ var1 var2 var3 var4;  
array mytemp [ 1 : 4 ] $ 1 _temporary_ ;  
do i = 1 to 4;  
    mytemp[ i ] = myarray[ i ];  
end;
```

## A DOW – loop

- Is sometimes named a **do** loop of **Whitlook** / **Dorfman Whitlook** loop
- Uses a loop to read complete by groups
- Stores all needed values from a by group in 2-dimensional temporary arrays
- Uses the techniques discussed before
- Is not a typo ;)

### Example (read data):

```
array myarray $ var1 var2 var3 var4;
```

Link to variables

```
array mytemp [ 1 : 4 , 1 : 3 ] $ 1 _temporary_;
```

Define 2 dim.

```
do until ( fin or last.var1 );
```

Array

```
    set mydata ( end = fin );
```

```
    by var1;
```

```
    if first.var1 then row = 1;
```

Read in by groups

```
        else row + 1;
```

```
    do i = 1 to 4;
```

```
        mytemp[ i , row ] = myarray[ i ];
```

```
    end;
```

Get the values

```
end;
```

## Example (write data):

```
array myarray $ var1 var2 var3 var4;
```

```
array mytemp [ 1 : 4 , 1 : 3 ] $ 1 _temporary_;
```

Link to variables

Define 2 dim.

Array

.....

```
do r = 1 to row ;
```

```
  do i = 1 to 4 ;
```

```
    myarray[ i ] = mytemp[ i , r ] ;
```

```
    output;
```

```
  end;
```

```
end;
```

Write by groups

### Use macros to aid with the following tasks:

- Get max. number of observations in a by group
- Get a list of variables for array definition
- Get the number of variables
- Create a format to link variable names to indices
- Use the link given by a format.
- Define the arrays
- Load the values to the 2. dim. array
- Write out the data

.....

Lest 's have a look on some of this options.

## Get max. number of observations in a by group

### Done with a simple sql

```
proc sql noprint;  
  select max(count) into : result  
  from   ( select count(*) as count  
           from   &ds.  
           group by &list. );  
quit;
```

**Maximum number**

**Name of dataset**

**List of by variables**

### Use the link given by a format.

#### Done with a simple macro

```
%macro getid( i , var );  
    mytemp [ &i. , input( "&var." , $fmt. ) ]  
%mend getid;
```

#### Define the macro

```
%getid( 2 , var3 ) = 'F';
```

#### Macro call

The macro gives the reference to the second row in the column defined by the number to which “var3” evaluates.

Benefit: If you have to insert a variable in your array definition you must not rearrange the references.

What you may find if you have a complete by group in random access

| Date of imaging | Lesion number | Lesion measurement | Patient number | Treatment course | THISMISS                                      | MISSTYPE                                                                                                            |
|-----------------|---------------|--------------------|----------------|------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| .               | Lesion no 6   | .                  | 391065         | 6                | Probably the cycle for a wrong reported image | Check with the observation for leason Lesion no 6 with cycle 4 or date 14MAR11                                      |
| 17JAN2011       | Lesion no 1   | 7.00               | 391065         | 4                |                                               |                                                                                                                     |
| 17JAN2011       | Lesion no 2   | 12.00              | 391065         | 4                |                                               |                                                                                                                     |
| 17JAN2011       | Lesion no 3   | 9.00               | 391065         | 4                |                                               |                                                                                                                     |
| 17JAN2011       | Lesion no 4   | 7.00               | 391065         | 4                |                                               |                                                                                                                     |
| 17JAN2011       | Lesion no 5   | 11.00              | 391065         | 4                |                                               |                                                                                                                     |
| 17JAN2011       | Lesion no 6   | 25.00              | 391065         | 4                | Probably the right image for this cycle       | Check with the observation for leason Lesion no 6 with cycle 4 or date 14MAR11                                      |
| 17JAN2011       | Lesion no 7   | 17.00              | 391065         | 4                |                                               |                                                                                                                     |
| 14MAR2011       | Lesion no 1   | 7.00               | 391065         | 6                |                                               |                                                                                                                     |
| 14MAR2011       | Lesion no 2   | 11.00              | 391065         | 6                |                                               |                                                                                                                     |
| 14MAR2011       | Lesion no 3   | 10.00              | 391065         | 6                |                                               |                                                                                                                     |
| 14MAR2011       | Lesion no 4   | 10.00              | 391065         | 6                |                                               |                                                                                                                     |
| 14MAR2011       | Lesion no 5   | 13.00              | 391065         | 6                |                                               |                                                                                                                     |
| 14MAR2011       | Lesion no 6   | 24.00              | 391065         | 4                | Probably a wrong cycle reported               | Check with other observations for leason Lesion no 6 with cycle 6 and date . and also with cycle 4 and date 17JAN11 |
| 14MAR2011       | Lesion no 7   | 14.00              | 391065         | 6                |                                               |                                                                                                                     |

# Thank you

# SAS Goes Spreadsheet – Accessing SAS Data in 2D Questions ?

