A Beginner's Guide to Arrays and Do Loops
Session # 4419
Exercises #1 - #4 Guide

All hands-on portions of the workshop will use a single data set. This data set contains 34 observations with 41 variables. The variables in the data set are as follows:

Variable	Variable Description	Variable Type	Variable Values
ID	Subject ID	Numeric	
CESD1_1 – CESD1_20	CESD items 1-20 measured at week 1	Numeric	1-4
CESD24_1 – CESD24_20	CESD items 1-20 measured at week 24	Numeric	1-4

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Exercise # 1 – Creating an Indexed ARRAY and Iterative DO Loop to Rescale CESD Item Values from 1-4 to 0-3

1. Open the SAS program named **exercise1.sas**.
2. Create two indexed arrays with array names **acesd** and **ancesd**. Each array will contain the 40 CESD items that need to be rescaled. Each array is started for you with the array name.
   a. What is the arrayname for the first array?
   b. How many elements will it have in it?
   c. What are the elements (variables) that it should contain?
   d. Recall the syntax for each array
      i. ARRAY arrayname {num_elements} list_of_array_elements;
3. Create an iterative DO loop. The DO loop is started for you.
   a. What is the starting value for the iterative DO loop?
   b. What is the ending value for the iterative DO loop?
4. Within the DO loop, rescale the items using the indexed array names rather than the variable names.
5. End the DO loop.
6. Submit the program and check the Log Window for errors. Fix any errors until you get an error free program. Look at the Output Window and make sure the rescaled data are calculated correctly.

Exercise #2 – Creating a Non-Indexed ARRAY and Using a Non-Iterative DO Loop (DO OVER) to Rescale CESD Item Values from 1-4 to 0-3

1. Open the SAS program named **exercise2.sas**.
2. Create two indexed arrays with array names **acesd** and **ancesd**. Each array will contain the 40 CESD items that need to be rescaled. Each array is started for you with the array name.
   a. What is the arrayname for the first array?
   b. What are the elements (variables) that it should contain?
   c. Recall the syntax for each non-indexed array
      i. ARRAY arrayname list_of_array_elements;
3. Create a non-iterative DO OVER loop.
   a. What is the array name that you should use in the non-iterative DO OVER loop?
4. Within the DO loop, rescale the items using the array names rather than the variable names.
5. End the DO loop.
6. Submit the program and check the Log Window for errors. Fix any errors until you get an error free program. Look at the Output Window and make sure the rescaled data are calculated correctly.

Exercise #3 – Using an Index Array and Iterative DO Loop to Reverse Items without Creating a New Variable

1. Open the SAS program named **exercise3.sas**.
2. Note that this exercise builds off exercise 1. Modified SAS code from Exercise 1 is in the top portion of the program.
3. We want to reverse items 4, 8, 12, and 16. We will reference just indexes 4, 8, 12, and 16 and create a nested DO loop.
   a. What indexed items do we need to include in the IF-THEN statement.
4. Within the nested DO loop, reverse the items using the array names rather than the variable name.
5. End the nested DO loop.
6. End the DO loop.
7. Submit the program and check the Log Window for errors. If there are any errors, fix them and submit again until you get an error free program. Look at the Output Window and make sure the reversed items are calculated correctly.

Exercise #4 – Creating a Long, Skinny Data Set from a Short, Wide Data Set

1. Open the SAS program named **exercise4.sas**.
2. Note that this exercise builds off exercise 3. The SAS code from Exercise 3 is in the top portion of the program.
3. In the second SAS data set code called "cesdlong", create 20 indexed arrays with array names **aone, atwo, …, atwenty** corresponding to the 20 CESD items. Each array will contain the two variables corresponding to the CESD item variable at each time point. You will be entering the information into the first 3 arrays, the rest (afour – atwenty) have been done for you.
4. Create an iterative DO loop. The DO loop is started for you.
   a. What is the end value for the iterative DO loop? *This value tells you how many observations per subject will be output to the new data set.*
5. Within the DO loop a time point variable has been created for you. If you were doing this yourself, you would need to create a time point variable. It can be as simple as saying "timept=i;" or using some mathematical formula if time points are some function of i.
6. Within the DO loop, create a statement to create a new CESD item variable that assigns the value of the CESD item array to the new CESD item variable. You will be creating the first three variables cesd1, cesd2, and cesd3. The rest (cesd4-cesd20) have been done for you.
7. Within the DO loop, create the CESD total score using the new CESD item variables you created.
8. Within the DO loop, type an OUTPUT statement to output the current observation with the newly created variables and values to a new observation.
9. End the DO loop
10. Use a KEEP statement to keep only those variables needed in the new data set. This has been done for you.
11. Submit the program and check the Log Window for errors. Make sure your data set now has 68 observations and 22 variables. If there are any errors, fix them and submit again until you get an error free program. Look at the Output Window and make sure the data are long and skinny and appear correct based on the short, wide data set we started with.