

# University of Florida Health Cancer Center, Division of Quantitative Sciences: SAS Macro Guide

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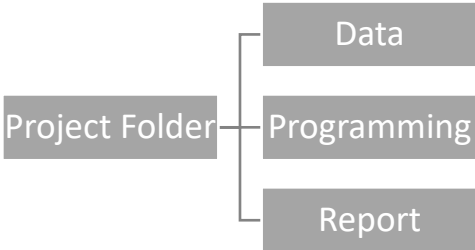
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## Setup

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### Project Folder Scheme

These macros are developed to work with the following folder structure.



You need to create a *Project folder* and create *Data*, *Programming*, and *Report* folders within it. To increase reproducibility, the SAS macro code file (UFHCCmacros.sas) used in your analyses should be stored in the programming folder. The result output will be stored in Report folder.

# DemographTable

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## Description

Title: Create Demographic tables for two treatment groups.  
 Author: Yu Wang [youthwang@ufl.edu](mailto:youthwang@ufl.edu)  
 Created: 2/20/2019

The **DemographTable** macro creates a demographic table for two treatment groups with both nominal (categorical) variables and numerical variables. The results include a p-value using a chi-square exact test for categorical variables and either the T-test or the Wilcoxon rank-sum test for numerical variables. The results are saved to an excel file in the Report folder.

### Parameters

- TrtValue The treatment variable name or class variable name
- value1 One value of the treatment value
- value2 The other value of the treatment value
- catlist The list of all categorical variables
- numlist The list of all numeric variables
- Test The statistical test used for the numeric variables, Ttest or Wilcoxon
- dataname The dataset name

## Example<sup>1</sup>

```
%let home= ; *define a home pathway for project folder;
libname ProName "&home\Data"; *define a SAS library for project's data folder;
%inc "&home\Programming\UFHCCmacros.sas"; *Load all the UFHCC macros (DemographTable was
included) into SAS system;
```

```
Data ProName.Neuralgia;
input Treatment $ Sex $ Age Duration Pain $ @@;
datalines;
P F 68 1 No B M 74 16 No P F 67 30 No
P M 66 26 Yes B F 67 28 No B F 77 16 No
A F 71 12 No B F 72 50 No B F 76 9 Yes
A M 71 17 Yes A F 63 27 No A F 69 18 Yes
B F 66 12 No A M 62 42 No P F 64 1 Yes
A F 64 17 No P M 74 4 No A F 72 25 No
P M 70 1 Yes B M 66 19 No B M 59 29 No
A F 64 30 No A M 70 28 No A M 69 1 No
B F 78 1 No P M 83 1 Yes B F 69 42 No
B M 75 30 Yes P M 77 29 Yes P F 79 20 Yes
A M 70 12 No A F 69 12 No B F 65 14 No
B M 70 1 No B M 67 23 No A M 76 25 Yes
P M 78 12 Yes B M 77 1 Yes B F 69 24 No
P M 66 4 Yes P F 65 29 No P M 60 26 Yes
A M 78 15 Yes B M 75 21 Yes A F 67 11 No
P F 72 27 No P F 70 13 Yes A M 75 6 Yes
B F 65 7 No P F 68 27 Yes P M 68 11 Yes
P M 67 17 Yes B M 70 22 No A M 65 15 No
P F 67 1 Yes A M 67 10 No P F 72 11 Yes
A F 74 1 No B M 80 21 Yes A F 69 3 No
;

%let catlist= Sex Pain;
%let numlist= Age Duration;
```

<sup>1</sup> Data from SAS documentation, example 51.2

```
%DemographTable(Treatment, A, B, &catlist, &numlist, Wilcoxon, ProName.Neuralgia);
```

## Example Results output

Variables	Total (N=60)	Treatment		p-value*
		A (N=20)	B (N=20)	
<b>Pain</b>				
No	35 (58.3%)	15 (75%)	15 (75%)	1
Yes	25 (41.7%)	5 (25%)	5 (25%)	
<b>Sex</b>				
F	30 (50%)	10 (50%)	10 (50%)	1
M	30 (50%)	10 (50%)	10 (50%)	
<b>Age</b>				
Median(range)	69 (59-83)	69 (62-78)	70 (59-80)	0.335
<b>Duration</b>				
Median(range)	16 (1-50)	15 (1-42)	20 (1-50)	0.473
*Note: For two group comparisons, P-value for discrete variables,using Chi-Square Exact Test; P-value of numeric variables, using Wilcoxon Rank-Sum test				

# Frequency\_t

---

## Description

Title: Create Frequency tables for multiple variables at one run.  
 Author: Yu Wang [youthwang@ufl.edu](mailto:youthwang@ufl.edu)  
 Created: 5/8/2019

The **Frequency\_t** macro creates a frequency summary table for multiple variables at a single run. The result output includes variable name, frequency value and the percentage columns. The output will be saved to an excel file in the Report folder.

### Parameters

- varlist\_names The variable name list that need to be summarized.
- dataname The dataset name

## Example<sup>2</sup>

```
/*If the following section has already been run, then this part can be skipped*/
%let home= ; *define a home pathway for project folder;
libname ProName "&home\Data"; *define a SAS library for project's data folder;
%inc "&home\Programming\UFHCCmacros.sas"; *Load all the UFHCC macros (DemographTable was
included) into SAS system;
```

```
/*If this data step has already been run, this step can be skipped*/
```

```
Data ProName.Neuralgia;
  input Treatment $ Sex $ Age Duration Pain $ @@;
  datalines;
P F 68 1 No B M 74 16 No P F 67 30 No
P M 66 26 Yes B F 67 28 No B F 77 16 No
A F 71 12 No B F 72 50 No B F 76 9 Yes
A M 71 17 Yes A F 63 27 No A F 69 18 Yes
B F 66 12 No A M 62 42 No P F 64 1 Yes
A F 64 17 No P M 74 4 No A F 72 25 No
P M 70 1 Yes B M 66 19 No B M 59 29 No
A F 64 30 No A M 70 28 No A M 69 1 No
B F 78 1 No P M 83 1 Yes B F 69 42 No
B M 75 30 Yes P M 77 29 Yes P F 79 20 Yes
A M 70 12 No A F 69 12 No B F 65 14 No
B M 70 1 No B M 67 23 No A M 76 25 Yes
P M 78 12 Yes B M 77 1 Yes B F 69 24 No
P M 66 4 Yes P F 65 29 No P M 60 26 Yes
A M 78 15 Yes B M 75 21 Yes A F 67 11 No
P F 72 27 No P F 70 13 Yes A M 75 6 Yes
B F 65 7 No P F 68 27 Yes P M 68 11 Yes
P M 67 17 Yes B M 70 22 No A M 65 15 No
P F 67 1 Yes A M 67 10 No P F 72 11 Yes
A F 74 1 No B M 80 21 Yes A F 69 3 No
;
```

```
/*The following line create a macro variable with name varlist to represent a list of
variable names */
```

```
%let varlist= Treatment Sex Pain;
```

```
/*The following two lines are the two equivalent ways to run the Frequency_t macro*/
```

```
%Frequency_t(&varlist, ProName.Neuralgia);
%Frequency_t(Treatment Sex Pain, ProName.Neuralgia);
```

<sup>2</sup> Data from SAS documentation, example 51.2

## Example Results output

**Frequency Table from data ProName.Neuralgia**

Variable Name	Variable values	Frequency	Percentage (%)
<b>Treatment</b>	A	20	33.3
	B	20	33.3
	P	20	33.3
<b>Sex</b>	F	30	50.0
	M	30	50.0
<b>Pain</b>	No	35	58.3
	Yes	25	41.7

# TTest\_FDR

## Description

Title: Perform the independent T-test with FDR adjusted p-value for multiple test adjustment.  
 Author: Yu Wang [youthwang@ufl.edu](mailto:youthwang@ufl.edu)  
 Created: 5/13/2019

The **TTest\_FDR** macro performs the independent T-test and creates a summary table for multiple tests at a single run. The FDR method was used to adjust the multiple test issue. The result output includes variable name, N, mean, SD, mean difference, p-value and FDR adj p. The output will be saved to an excel file in the Report folder.

### Parameters

- **Treat\_variable** The treatment variable name or class variable name.
- **dataname** The dataset name
- **value1** One value of the treatment value
- **value2** The other value of the treatment value
- **varlist\_name** The list of all numeric variables that need to be compared
- **dataname** The dataset name

## Example<sup>3</sup>

```
/*If the following section has already been run, then this part can be skipped*/
%let home= ; *define a home pathway for project folder;
libname ProName "&home\Data"; *define a SAS library for project's data folder;
%inc "&home\Programming\UFHCCmacros.sas"; *Load all the UFHCC macros (DemographTable was
included) into SAS system;

/*If this data step has already been run, this step can be skipped*/
Data ProName.Neuralgia;
input Treatment $ Sex $ Age Duration Pain $ @@;
datalines;
P F 68 1 No B M 74 16 No P F 67 30 No
P M 66 26 Yes B F 67 28 No B F 77 16 No
A F 71 12 No B F 72 50 No B F 76 9 Yes
A M 71 17 Yes A F 63 27 No A F 69 18 Yes
B F 66 12 No A M 62 42 No P F 64 1 Yes
A F 64 17 No P M 74 4 No A F 72 25 No
P M 70 1 Yes B M 66 19 No B M 59 29 No
A F 64 30 No A M 70 28 No A M 69 1 No
B F 78 1 No P M 83 1 Yes B F 69 42 No
B M 75 30 Yes P M 77 29 Yes P F 79 20 Yes
A M 70 12 No A F 69 12 No B F 65 14 No
B M 70 1 No B M 67 23 No A M 76 25 Yes
P M 78 12 Yes B M 77 1 Yes B F 69 24 No
P M 66 4 Yes P F 65 29 No P M 60 26 Yes
A M 78 15 Yes B M 75 21 Yes A F 67 11 No
P F 72 27 No P F 70 13 Yes A M 75 6 Yes
B F 65 7 No P F 68 27 Yes P M 68 11 Yes
P M 67 17 Yes B M 70 22 No A M 65 15 No
P F 67 1 Yes A M 67 10 No P F 72 11 Yes
A F 74 1 No B M 80 21 Yes A F 69 3 No
;
```

<sup>3</sup> Data from SAS documentation, example 51.2

```
/*The following line create a macro variable with name varlist to represent a list of
variable names (Age and Duration); this can be skipped if you use the variable names directly
as the second way of run the macro*/
```

```
%let varlist= Age Duration;
```

```
/*The following two lines are the two equivalent ways to run the TTest_FDR macro*/
%TTest_FDR(Treatment, A, B, &varlist, ProName.Neuralgia);
%TTest_FDR(Treatment, A, B, Age Duration, ProName.Neuralgia);
```

## Example Results output

Two samples independent T-Test									
by Treatment with A vs B									
Variable Name	Treatment						Mean difference	P-value	FDR adj p
	A			B					
	N	Mean	SD	N	Mean	SD			
Age	20	69.3	4.4	20	70.9	5.5	-1.6	0.3165	0.434
Duration	20	16.4	10.6	20	19.3	12.9	-2.95	0.434	0.434