Objectives:

* Use PROC POWER to calculate power and sample size
* Examine relationships between significance level, sample size, effect size and power
* Use SAS for power analysis of two-sample data

**Part I: One-Sample Tests**

One hundred thirty normal, healthy subjects had their body temperature, blood pressure measured. Each subjects’ sex is also included in the file. The following code shows you how to enter data from a CSV file into SAS. Please download the file from BB onto the desktop of your computer.

**/\* Code to enter the data \*/**

**filename normtemp 'C:\correct\pathname\normtemp.csv';**

**options linesize = 80;**

**data temp;**

infile normtemp dlm = ',' firstobs = **2**;

**/\* Starts SAS reading from the second line of the file.\*/**

**/\* “DLM” means “delimiter” \*/**

input temp sex $ heart;

**run**;**input temp sex $ heart;**

**run;**

**Proc Print data=temp; run;**

**/\* Always print the data to check that it has been \*/**

**/\* entered correctly! \*/**

**Proc Contents data=temp; /\* Outputs the variable names and types \*/**

There are three things needed to determine the correct sample size for a study:

1. Effect size (or the hypothesized mean and population standard deviation)
2. Type I error (usually 0.05)
3. Type II error (usually 0.2)

If we have three of Type I error, Type II error, sample size and effect size, the fourth can be determined.

Examples using SAS Proc Power:

**/\* Default alpha is 0.05. Does not need to be given. \*/**

**proc** **power**;

onesamplemeans **/\*need to tell SAS the type of test \*/**

mean = **3 /\* desired or expected mean value \*/**

null = **0 /\* value of the mean according to the null hypothesis \*/**

ntotal = **. /\* Total sample size. The `.’ after ntotal asks SAS to calculate the total sample size for the study from the other parameters given. \*/**

stddev = **10 /\* population standard deviation (or a good guess) \*/**

power = **.8**; **/\* power = 1 – Type II error \*/**

**run**;

**/\* Here is the SAS output \*/**

**Part II: Two-Sample Tests**

**proc** **power**;

twosamplemeans test=diff /\* Equal SDs \*/

/\* Use diff\_satt for unequal SDs \*/

groupmeans = **X1** | **X2** /\* mean of each group \*/

stddevs = **sp** /\* pooled standard deviation \*/

/\* Use groupstddevs = s1 | s2 for unequal SDs \*/

ntotal = **N** /\* Total sample size \*/

power = **.** ; /\* Calculate power = 1 – Type II error \*/

### run;