



Backward Selection Method: Immunity Test of covariates

Introduction

- Purpose of this paper is to provide SAS® code which can be used for backward selection method.
- SAS® provides Type III Tests of Fixed Effects when we run PROC MIXED on data which determines covariate being significant or non-significant based on their prob-F value (Pr > F column value).
- With the help of Backward Selection we can find optimum model for the analysis.



ILLUSTRATION

Let’s start with an example; To determine which all factors are causing change in certain Lab test from its baseline. At the beginning we might not be sure which of these factors/variables like baseline height, baseline weight, baseline age, baseline vitals, etc. along with treatment and baseline of that Lab Test itself might be causing the change.



In such scenarios, it is always good to list all possible variables that we think might be required to find appropriate model. This code will eliminate insignificant covariates one after the other instead of dropping all insignificant variables at once. Dropping criteria is Maximum prob-F value.

Type 3 Tests of Fixed Effects				
Effect	Num DF	Den DF	F Value	Pr > F
bsln	1	22	3.74	0.0662
var01	10	22.4	1.32	0.2798
trtname	3	24.1	0.69	0.5686
vstnm	2	53.9	4.96	0.0105
trtname*vstnm	6	69.2	1.72	0.1283
var06	1	22	0.00	0.9517
var07	1	22	0.44	0.5124

These are permanent variables and will not be dropped

Whereas, **VAR06** will be dropped in this Iteration because of having highest prob-F value within criteria.

Programming Considerations:

- Use sufficient and realistic data to perform analysis otherwise results would not be reliable.
- Correctly determine required variables that you want to pass in this code.
- Recognize CLASS statement variables correctly i.e. those variables which are categorical in nature (And in case you are passing any character variables).
- Make sure you don’t have duplicate records at a time point for any subject.
- Double check the data provided in this case as this code will execute in spite of wrong data as long as required variables and proper syntax is available but the outcome will not be appropriate.