

SAS4 ANOVA

2 x 2 Factorial Design

$$Y_{ijk} = \mu + G_i + Trmt_j + G*Trmt_{ij} + error_k$$

Where:

Y_{ijk} = individual observation (eg. 12, 14, 20, etc...)

μ = overall mean

G_i = effect of gender

$Trmt_j$ = effect of treatment

$G*Trmt_{ij}$ = interaction between gender & treatment

$error_k$ = random error

Proc GLM

```
Proc glm data=exp;
class gender trmt;
model Y = gender trmt gender*trmt;
Run;
```

Proc MIXED

```
Proc mixed data=exp;
class gender trmt;
model Y = gender trmt gender*trmt;
Run;
```

Clearly identify the experimental unit in any model you create!

Correctly identify the error term for each factor in your model!

Clearly identify which of the factors in your model are FIXED or RANDOM factors

To create graph of data before analysis.

1. Create new dataset with means of each treatment group

```
Proc means data=insulin nway noprint;
class table diet insulin;
var glucose;
output out=meanins mean=meanins;
Run;
```

2. Create plot of means by each table

```
Proc gplot data=meanins;
plot meanins*diet=insulin / haxis=axis1
vaxis=axis2;
```

by table;

symbol v='A' c=black h=2;

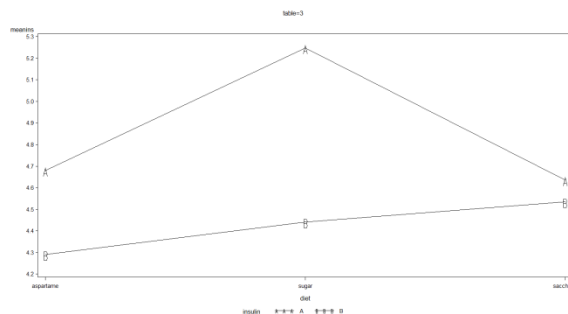
symbol v='B' c=black h=2;

axis1 minor=none offset=(2,2);

axis2 minor=none;

Run;

Quit;



Test statement

- states the hypothesis (the treatment effect we are testing) along with the correct error term that should be used to test the hypothesis
- Need to know what the experimental unit is for the factor in question along with its correct error term
- Used in **Proc GLM**

Test h=diet e=table*diet;

Sample Strip plot coding

Proc GLM

```
Proc glm data=insulin;
class table diet insulin;
model glucose = table|diet|insulin;
random table table*diet table*insulin
table*diet*insulin;
test h=diet e=table*diet;
test h=insulin e=table*insulin;
test h=diet*insulin e=table*diet*insulin;
Run;
Quit;
```

Proc MIXED

```
Proc mixed data=library.insulin;
class table diet insulin;
model glucose = diet insulin diet*insulin;
random table table*diet table*insulin
table*diet*insulin;
Run;
```