

ADA2 CH 5, END, INTERPRETING FACTOR MODEL COEFFICIENTS

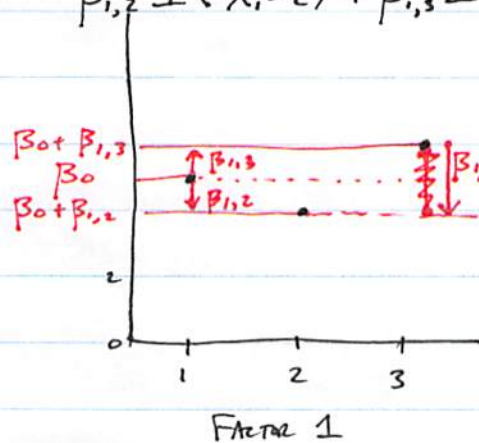
0. INDICATOR FUNCTION: $I(X=a) = \begin{cases} 1, & X=a \\ 0, & X \neq a \end{cases}$

1. ANOVA

SHORT-HAND $\hat{y} = \beta_0 + \beta_1 X_1$

ACTUAL $\hat{y} = \beta_0 + \beta_{1,2} I(X_1=2) + \beta_{1,3} I(X_1=3)$

F_1	MEAN
1	$\hat{y} = \beta_0$
2	$\hat{y} = \beta_0 + \beta_{1,2}$
3	$\hat{y} = \beta_0 + \beta_{1,3}$



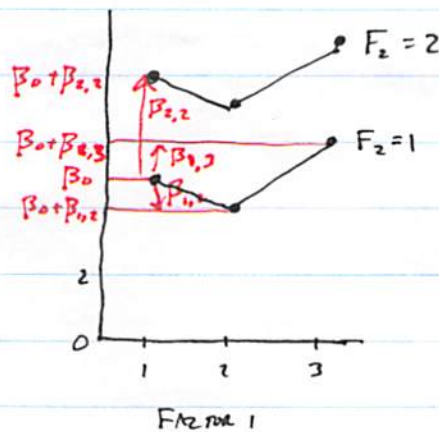
	F_1			
	1	2	3	
\hat{y}	5	4	6	5

2. 2-WAY ADDITIVE

SHORT-HAND $\hat{y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2$

ACTUAL $\hat{y} = \beta_0 + \beta_{1,2} I(X_1=2) + \beta_{1,3} I(X_1=3) + \beta_{2,2} I(X_2=2)$

F_1	F_2	MEAN
1	1	$\hat{y} = \beta_0$
2	1	$\hat{y} = \beta_0 + \beta_{1,2}$
3	1	$\hat{y} = \beta_0 + \beta_{1,3}$
1	2	$\hat{y} = \beta_0 + \beta_{2,2}$
2	2	$\hat{y} = \beta_0 + \beta_{1,2} + \beta_{2,2}$
3	2	$\hat{y} = \beta_0 + \beta_{1,3} + \beta_{2,2}$



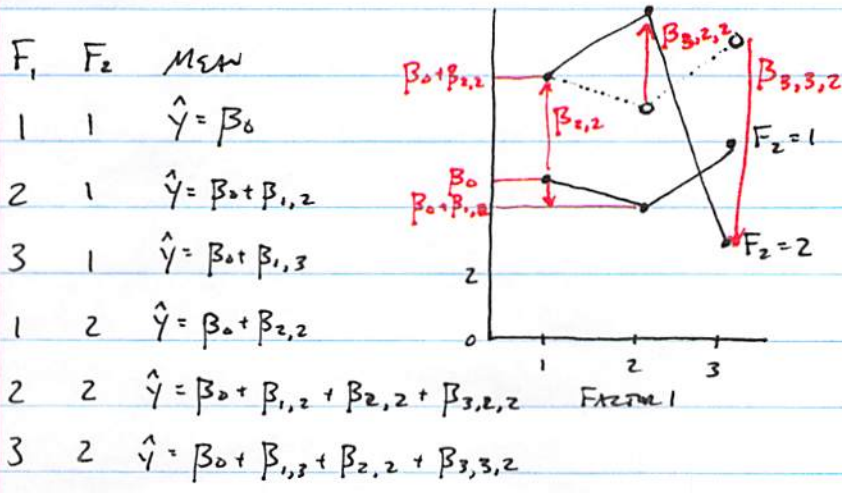
\hat{y}	F_1			
F_2	1	2	3	
1	5	4	6	5
2	8	7	9	8
	6.5	5.5	7.5	6.5

3. 2-WAY INTERACTION

STAT-HAND: $\hat{y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2$

ACTUAL: $\hat{y} = \beta_0 + \beta_{1,2} I(X_1=2) + \beta_{1,3} I(X_1=3)$

$+ \beta_{2,2} I(X_2=2) + \beta_{3,2,2} I(X_1=2, X_2=2) + \beta_{3,3,2} I(X_1=3, X_2=2)$



\hat{y}	F_1			
F_2	1	2	3	
1	5	4	6	5
2	8	10	3	7
	6.5	7	4.5	6

F_1 F_2 MEAN

1 1 $\hat{y} = \beta_0$

2 1 $\hat{y} = \beta_0 + \beta_{1,2}$

3 1 $\hat{y} = \beta_0 + \beta_{1,3}$

1 2 $\hat{y} = \beta_0 + \beta_{2,2}$

2 2 $\hat{y} = \beta_0 + \beta_{1,2} + \beta_{2,2} + \beta_{3,2,2}$ FACTOR 1

3 2 $\hat{y} = \beta_0 + \beta_{1,3} + \beta_{2,2} + \beta_{3,3,2}$