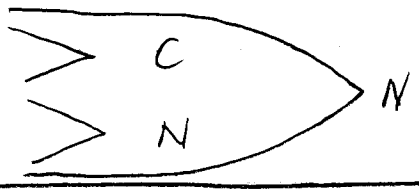
Stat 461 HW9 Jiaqi Li

1.

Factor	R/F	N/C
i = State	R	
j = Enviroment	F	
t = Lake	R	



Thus, we use the Mixed Model: $(\alpha\beta)_{ij} \overset{iid}{\sim} N(0, \sigma^2_{Int})$

$Y_{ijt} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + \varepsilon_{ijt}$, $\alpha_i \overset{iid}{\sim} N(0, \sigma^2_{State})$, $\varepsilon_{ijt} \overset{iid}{\sim} N(0, \sigma^2)$.

Y_{ijt} = the phosphorous level of t^{th} lake in j^{th} environemte of state i.

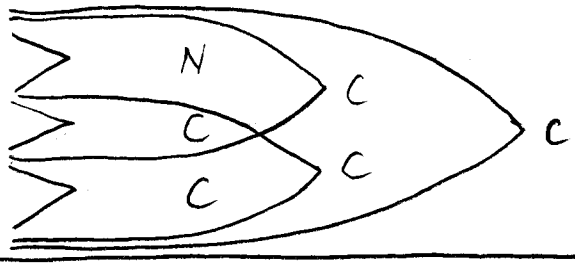
i = New York, Pennsylvania, Vermount.

j = agriculture land, forest

$t = 1, 2, 3, 4$

2.

Factor	R/F	NC
i = Type	F	
j = Road	R	
k = Paint	F	
t = Year (replicate)	R	



Thus, we use the Mixed Model:

$Y_{ijkt} = \mu + \alpha_i + \beta_{j(i)} + \gamma_k + \varepsilon_{ijkt}$, $\beta_{j(i)} \overset{iid}{\sim} N(0, \sigma^2_{Road})$, $\varepsilon_{ijkt} \overset{iid}{\sim} N(0, \sigma^2)$

Y_{ijkt} = number of crashes on road j of type i with or without paint.

i = mountainous, city

$j = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10$

k = with, without

$t = 1, 2, 3$.