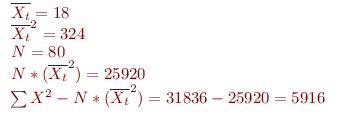
| **Factor B: Fullness** | | | | | |
| --- | --- | --- | --- | --- | --- |
| Factor A:  Weight |  | Empty | Full |  |  |
| Normal | n=20  X=22 T=440  SS=1540 | n=20  X =15  T=300  SS=1270 | Tnormal=740 |  |
| Obese | n=20  X = 17  T=340  SS=1320 | n=20  X = 18  T=360  SS=1266 | Tobese=700 |  |
|  | Tempty=780 | Tfull=660 |  | G=1440  N=80 |

step 1. Build hypotheses

1. 몸무게와 과자 섭취량에는 상관 관계가 있다.
2. 포만감과 과자 섭취량에는 상관 관계가 있다.
3. 몸무게와 포만감의 상호관계와 과자 섭취량에는 상관 관계가 있다.

step 2. Locate the critical range for F-ratio. calculate the $dfs$

1. $df_{total}$ = N-1 = 80-1 =79
2. $df_{within}$ = N-k = 80-4 = 76
3. $df_{between}$ = k-1 = 4-1 = 3
4. $df_A$ = 2-1 = 1
5. $df_B$ = 2-1 = 1
6. $df_{AxB}$ = 3-1-1=1

Compute F-ratio   
SS

1. $SS_{total}$ = 31836 – 1440\*1440/80 = 5916

$SS_{within} = \Sum{SS_{within}} = 1540 + 1270 + 1320 + 1266 = 5396$

$SS_{between}$ = ((440^2)/20) + ((300^2)/20) + ((340^2)/20) + ((360^2)/20) - ((1440^2)/80) = 520

1. $SS_A$ = ((740^2)/40) + ((700^2)/40) - ((1440^2)/80) = 20
2. $SS_B$ = ((780^2)/40) + ((660^2)/40) - ((1440^2)/80) = 180
3. $SS_{AxB}$ = 520 – 180 – 20 = 320

MS

1. $MS_{A}$ = 20/1 = 20 :SS(A) / df(A)
2. $MS_{B}$ = 180/1 = 180 :SS(B) / df(B)
3. $MS_{AxB}$ = 320/1 = 320 : SS(AxB) // df(AxB)
4. $MS_{Within}$ = 5396/76 = 71 : SS(within) // df(within)

F-ratio

1. $F_{A}$ =20/71 : MS(A) / MS(within)
2. $F_{B}$ = 180/71 : MS(B) / MS(within)
3. $F_{AxB}$ = 320/71 : MS(AxB) / MS(within)

| **Table 1. Mean number of crackers eaten in each treatment condition** | | | |
| --- | --- | --- | --- |
|  |  | Fullness | |
|  |  | Empty stomach | Full stomach |
| Weight | Normal | M=22  SD=9.00 | M=15  SD=8.18 |
| Obese | M=17  SD=8.34 | M=18  SD=8.16 |

| **Result** | | | | |
| --- | --- | --- | --- | --- |
| Source | SS | df | MS | F |
| Between treatment | 520 | 3 |  |  |
| Factor A (weight) | 20 | 1 | 20 | 20/71 |
| Factor B (fullness) | 180 | 1 | 180 | 180/71 |
| A x B interaction | 320 | 1 | 320 | 314/71 |
| Within treatment | 5396 | 76 | 71 |  |
| Total | 5916 | 79 |  |  |
| weigth x fullness factorial design | | | | |

3.

F(A)(1,76) = 20/71

F(B)(1,76) = 180/71

F(AxB)(1,76) = 320/71

Fcritical value(1, 76, p<0.05)

여기서 76은 F-distribution table에서 가까운 값인 60으로 사용한다.

= Fcritical value(1, 60, p<0.05) = 4

몸무게와 포만감은 관련이 없지만 상호작용을 하면 관련이 있다.

1. 몸무게와 포만감이 상호작용을 할때만 과자 섭취량의 비율이 증가한다.(p=0.05)