**ANOVA TEST**

200921309 이호승

Build hypothesis

Weight가 numberof crackers eaten에 영향을 미친다.

Fullness가 numberof crackers eaten에 영향을 미친다.

Weight와 Fullness가 numberof crackers eaten에 영향을 미친다.

Compute

1. $df\_{total}$ = N-1 = 80-1 =79

2. $df\_{within}$ = $df\_{total}$ - $df\_{between}$ = 79 -3 = 76

3. $df\_{between} $ = K-1 = 4-1 =3

4. $df\_{weight}$ = 2-1 = 1

5. $df\_{Fullness}$ = 2-1 = 1

6. $df\_{weight\*Fullness}$ = 3 – 1 – 1 = 1

7. $SS\_{total}$ = 5916

8. $SS\_{within}$ = 5396

9. $SS\_{between}$ = 5916 – 5396 = 520

10. $SS\_{weight}$ = $\sum\_{}^{}\frac{T\_{weight}}{n\_{weight}}$ - $\frac{G^{2}}{N}$ = $\frac{(740)^{2}}{40}$ + $\frac{(700)^{2}}{40}$ - $\frac{(1440)^{2}}{80}$ = 20

11. $SS\_{Fullness}$= $\sum\_{}^{}\frac{T\_{Fullness}}{n\_{Fullness}}$ - $\frac{G^{2}}{N}$ = $\frac{(780)^{2}}{40}$ + $\frac{(660)^{2}}{40}$ - $\frac{(1440)^{2}}{80}$ = 180

12. $SS\_{weight\*Fullness}$ = $SS\_{between}$ - $SS\_{weight}$ - $SS\_{Fullness}$ = 520 – 20 – 180 = 320

13. $MS\_{weight}$ = $\frac{SS\_{weight}}{df\_{weight}}$ = $\frac{20}{1}$ = 20

14. $MS\_{Fullness}$ = $\frac{SS\_{Fullness}}{df\_{Fullness}}$ = $\frac{180}{1}$ = 180

15. $MS\_{weight\*Fullness}$ = $\frac{SS\_{weight\*Fullness}}{df\_{weight\*Fullness}}$ = $\frac{300}{1}$ = 300

16. $MS\_{within}$ = $\frac{SS\_{within}}{df\_{within}}$ = $\frac{5396}{76}$ = 71

17. $F\_{weight}$ = $\frac{MS\_{weight}}{MS\_{within}}$ = $\frac{20}{71}$ = 0.282

18. $F\_{Fullness}$ = $\frac{MS\_{Fullness}}{MS\_{within}}$ = $\frac{180}{71}$ = 2.54

19. $F\_{weight\*Fullness}$ = $\frac{MS\_{weight\*Fullness}}{MS\_{within}}$ = $\frac{320}{71}$ = 4.50

20. $F\_{critic}$(1,71) = 4.00

|  |
| --- |
| Table 1. Mean number of crackers eaten in each treatment condition |
|  | Fullness |
|  | Empty stomach | Full stomach |
| weight | Normal | M=22SD=9 | M=15SD=8.18 |
| Obese | M=17SD=8.34 | M=18SD=8.16 |

|  |
| --- |
| **Result**  |
| Source | SS | df | MS | F |
| Between treatment | 520 | 3 | . | . |
| Factor A (weight) | 20 | 1 | 20 | 0.282 |
| Factor B (fullness) | 180 | 1 | 180 | 2.54 |
| A x B interaction | 320 | 1 | 320 | 4.50 |
| Within treatment | 5396 | 76 | 71 | . |
| Total | 5916 | 79 | . | . |
| Weight x fullness factorial design |

통계학적 결론

$F\_{weight}와 F\_{Fullness}$는 $F\_{critic}$보다 작으므로 numbers of cracker eaten에 영향이 없다고 볼 수 있다.

 $F\_{weight\*Fullness}$는 $F\_{critic}$보다 크므로 numbers of cracker eaten에 영향을 끼친다고 분석 할 수 있다.

결론

Weight와 Fullness 각각은 하나의 variable로서는 numbers of cracker eaten에 영향을 줄 순 없지만 서로의 상호작용으로 인해 numbers of cracker eaten에 영향을 미친다는 것을 확인 할 수 있다.