Stat 100B Extra Credit

Question: The Bureau of Labor Statistics reported the mean weekly earnings by educational attainment in 2014 in the US. The data below (in dollars) is separated by education level and gender to determine if gender and education level varies wages.

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| --- | --- | --- | --- | --- | --- |
|  | High School Diploma | Some College | Bachelor’s Degree | Advanced Degree | Total |
| Male | 751 | 872 | 1249 | 1630 | 4502 |
| Female | 578 | 661 | 965 | 1185 | 3389 |
| Total | 1329 | 1533 | 2214 | 2815 | G: 7891 |

Source: <http://www.bls.gov/opub/ted/2015/median-weekly-earnings-by-education-gender-race-and-ethnicity-in-2014.htm>

Type of design: Randomized Block Design

Experimental Unit: People at different education levels

Factor(s): Gender and Education Level

Number of Levels: 2 and 4

Treatment: Education Level

Number of Treatments: 4

Response: week of wages for the education level

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source | df | SS | MS | F |
| Treatment | 3 | 687690.375 | 229230.125 | 31.664 |
| Block | 1 | 154846.125 | 154846.125 | 21.389 |
| Error | 3 | 21718.375 | 7239.458 |  |
| Total | 7 | 864255.875 |  |  |

|  |  |
| --- | --- |
| **Treatment:**  H0: μ1 = μ2 = μ3 = μ4  Ha: At least one μi differs, i = 1, 2, 3, 4  *t.s.* = F = 31.664  *c.v.* = *Fα, (k-1), (k-1)(b-1)* = F0.05, 3, 3 = 9.28  Reject H0 since *t.s.>* *c.v.*  There is sufficient evidence to suggest a difference in the mean weekly wages based on education level. | **Block:**  H0: μ1 = μ2  Ha: At least one μi differs, i = 1, 2  *t.s.* = *F*= 21.389  *c.v.* = *Fα, (b-1), (k-1)(b-1)* = *F*0.05, 1, 3 = 10.13  Reject H0 since *t.s. >* *c.v.*  There is sufficient evidence to indicate that blocking was necessary and a difference in mean wages based on gender. |