Problem 2 (20 points)

Results of a laboratory analysis of calories content of major hot dog brands are given below. Researchers for *Consumer Reports* analyzed three types of hot dog: beef, poultry, and meat (mostly pork and beef, but up to 15% poultry meat). The data are summarized in the table below:

Type	n_i	$\bar{y}_i$	s_i^2
Beef	20	156.85	512.66
Poultry	17	118.76	508.57
Meat	17	158.71	636.85

$$\bar{Y} = \frac{20(156.85) + 17(118.76) + 17(158.71)}{54} = 145.44$$

Reference: Moore, David S., and George P. McCabe (1989), *Introduction to the Practice of Statistics.* Original source: *Consumer Reports*, June 1986, pp. 366-367.

Construct the ANOVA table and test the hypothesis that the mean calories content for the three types of hot dogs are equal against the alternative that at least two are not equal. Use $\alpha = 0.05$.

Please use this space for your calculations:

$$BSS = 20(156.85-145.44)^2 + 17(118.76-145.44)^2 + 17(158.71-145.44)^2$$

$$BSS = 17698.52$$

$$WSS = (n_1-1)s_1^2 + (n_2-1)s_2^2 + (n_3-1)s_3^2$$

$$= 19(512.66) + 16(508.57) + 16(636.85) = 28067.26$$

Bonferroni: $\bar{x}_1 - \bar{x}_2 \pm t_{\frac{\alpha}{6};} s\sqrt{\frac{1}{20}+\frac{1}{17}}$

$$156.85 - 118.76 \pm 2.\_\_\sqrt{\frac{28067.26}{51}}\sqrt{\frac{1}{20}+\frac{1}{17}}$$

$$38.09 \pm 19.56 \quad 18.53 \leq \mu_1 - \mu_3 \leq 57.65$$

REJECT H_0

Complete the ANOVA table:

Source	d.f.	SS	MS	F
Between	2	17698.52	8849.16	16.08
Within	51	28067.26	550.34	
Total	53	45765.78