STAT 6348
Homework 1, Fall 2017

In the production of commercial eggs in Europe, four different types of housing systems for the chickens are used: cage, barn, free range, and organic. The characteristics of eggs produced from the four housing systems were investigated in Food Chemistry (Vol. 106, 2008). Twenty-eight grade A eggs were randomly selected from supermarkets – 10 of which were produced in cages, 6 in barns, 6 with free range, and 6 organic.

We need to answer the following questions:

1. Do different housing conditions result in different shell thickness, overrun and strength? Perform individual ANOVA tests and MANOVA.
2. If yes, identify between which groups the statistically significant differences occur.
3. Verify all assumptions behind the tests you use.
4. Justify your conclusions, both from a statistical perspective and domain knowledge perspective. (You can use any literature for it.)

HOUSING	THICKNESS	OVERRUN	STRENGTH
CAGE	0.47	495	36.9
CAGE	0.43	462	39.2
CAGE	0.38	488	40.2
CAGE	0.47	471	33
CAGE	0.44	471	39
CAGE	0.40	502	36.6
CAGE	0.41	472	37.5
CAGE	0.45	474	38.1
CAGE	0.41	492	37.8
CAGE	0.37	479	34.9
FREE	0.55	520	31.5
FREE	0.50	531	39.7
FREE	0.47	513	37.8
FREE	0.48	510	33.5
FREE	0.51	521	39.9
FREE	0.50	510	40.6
BARN	0.49	515	40
BARN	0.50	516	37.6
BARN	0.51	514	39.6
BARN	0.48	526	40.3
BARN	0.52	501	38.3

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BARN 0.50      508 40.2
ORGANIC 0.43      530 34.5
ORGANIC 0.49      544 36.8
ORGANIC 0.52      531 32.6
ORGANIC 0.49      532 38.5
ORGANIC 0.52      511 40.2
ORGANIC 0.44      527 33.2
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