STAT 110A
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Name:_____

Quiz 10

Insects. Some colors are more attractive to insects than others. In an experiment aimed at determining the best color for attracting cereal leaf beetles, six boards in each of four colors were placed in a field of oats in July. The following table gives data on the number of cereal leaf beetles trapped. (Modified from M. C. Wilson and R. E. Shade, "Relative attractiveness of various luminescent colors to the cereal leaf beetle and the meadow spittlebug," *Journal of Economic Entomology*, 60 (1967, pp. 578-580.)

Board color	Insects trapped					
Lemon Yellow	45	59	48	46	38	47
White	21	12	14	17	13	17
Green	37	32	15	25	39	41
Blue	16	11	20	21	14	7

(a) State the hypotheses of interest in words.
(b) Test the hypotheses from (a). The partial minitab output is given.

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SOURCE     DF        SS        MS        F        p
 FACTOR     3    4218.5    1406.2    deleted  deleted
 ERROR     20     920.5      46.0
 TOTAL     23    5139.0

                                    INDIVIDUAL 95 PCT CI'S FOR MEAN
                                    BASED ON POOLED STDEV
  LEVEL     N      MEAN     STDEV  ---+---------+---------+---------+---
 lyellow    6    47.167     6.795                                (----*----)
 white      6    15.667     3.327   (----*----)
 green      6    31.500     9.915                (----*----)
 blue       6    14.833     5.345   (---*----)
                                    ---+---------+---------+---------+---
 POOLED STDEV =    6.784              12        24        36        48
```

(c) Test the hypothesis $H_0 : \mu_1 + \mu_4 = \mu_2 + \mu_3$ against twosided alternative.
(d) Which of the means are significantly different at $\alpha = 0.05$? (Fisher's Multiple Comparisons)

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FISHER'S multiple comparison procedure

        Nominal level = 0.0500
    Family error rate = 0.192
Individual error rate = 0.0500

Critical value = 2.086

Intervals for (mean of column group) - (mean of row group)

             1        2        3

    2   23.329
        39.671

    3    7.496  -24.004
        23.837   -7.663

    4   24.163   -7.337    8.496
        40.504    9.004   24.837
```