Practice Quiz 10

Statistics 1000
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1. (10 pts.) Is there a significant difference in mean ages of students who identify them-selves as vegetarians, non-vegetarians, or sometimes-vegetarians? Analysis of variance was carried out on survey data from several hundred Pitt students:

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Analysis of Variance for Age
Source      DF        SS        MS        F        P
Veg?         2      14.23      7.11     0.84    0.434
Error      440    3742.07      8.50
Total      442    3756.30
                                     Individual 95% CIs For Mean
                                     Based on Pooled StDev
Level       N       Mean      StDev   ------+---------+---------+---------+
no        383     20.312      2.872       (---*---)
some       35     20.548      2.908   (-----------*-----------)
yes        25     21.058      3.554      (-------------*-------------)
                                     ------+---------+---------+---------+
Pooled StDev =   2.916            20.00     20.80     21.60     22.40
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(a) What are the total sample size N and the number of groups I?

(b) As far as the sample means are concerned, _____ were the youngest and _____ were the oldest.

(c) Sample standard deviations are

  i. close enough that it is reasonable to assume population standard deviations to be equal.

  ii. different enough to suggest that population standard deviations are not equal.

(d) Two of these express the correct conclusions to draw, given the size of the p-value; which two are they?

  i. There is a relationship between students' age and their being vegetarian, non-vegetarian, or sometimes-vegetarian.

  ii. There is no evidence of a relationship between students' age and their being vegetarian, non-vegetarian, or sometimes-vegetarian.

  iii. Mean age may be equal for populations of students in the three categories (vegetarian, non-vegetarian, sometimes-vegetarian).

  iv. Mean age differs for populations of students in all three categories (vegetarian, non-vegetarian, sometimes-vegetarian).

  v. Mean age differs for populations of students in at least two of the three categories (vegetarian, non-vegetarian, sometimes-vegetarian).

(e) The F statistic can be considered (i) large (ii) not large (iii) borderline

(f) Explain why it is not a problem that the distributions of ages are somewhat skewed.