

Practice Quiz 10

Statistics 90-707

Fall 2021

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

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

- (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 to assume equal population standard deviations.
 - 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's not a problem that distributions of ages are somewhat skewed.