

3. A random sample of 200 college students are cross-classified according to whether they are morning-type or evening-type individuals and whether their majors are in the art or science fields.

Type	Major	
	Art	Science
Morning	37	44
Evening	67	52

With an alpha level of .05, conduct a test to determine whether type and major have an association. (10 pts.)

H_0 :

H_a :

Compute the test statistic and approximate the p -value.

Should the null hypothesis be rejected? Circle one. Yes No

4. Briefly, but clearly, describe an example of an observational study in which there is a lurking variable. (6 pts.)

5. At a college, Freshman advisers are randomly assigned to all new students. Of all the Freshman advisers, 35% are women, 75% are fulltime faculty, and 20% are fulltime women faculty. Suppose that you are a new student just enrolled in this college.
- (a) What is the probability that your Freshman adviser will be a woman, fulltime faculty member, or both? (6 pts.)
- (b) You were told by an administrator that your Freshman adviser would be a woman. Given this information, what is the probability that your adviser will be a fulltime faculty member? (6 pts.)
- (c) Are the events “woman adviser is assigned” and “fulltime faculty adviser is assigned” independent? Justify your answer. (6 pts.)
6. Featured below is a stem-and-leaf plot for the data on health-insurance co-pay for a sample of 10 policy holders. Note that the minimum value is \$20 and the maximum is \$40 in the data. Compute the (a) sample median, (b) sample mean, and (c) sample standard deviation. (12 pts.)

Stem	Leaf
2	0
2	555
3	000
3	55
4	0
4	

7. A survey was conducted to estimate the proportion of the Americans who believe that a severe economic recession is forthcoming. Of the 950 people surveyed, 361 said that a severe recession is ahead. Conduct a test to determine whether less than 40% of the Americans believe that a severe recession is forthcoming. Use $\alpha = .01$. (10 pts.)

H_0 : _____ vs. H_a : _____

Compute the test statistic and calculate the p -value.

Should the null hypothesis be rejected? Circle one. Yes No

8. Suppose that prices of regular unleaded gasoline vary according to a normal distribution with a mean of \$3.45 per gallon and a standard deviation of \$0.10.
- (a) Find the probability that the price of regular unleaded gasoline is higher than \$3.60 per gallon at a randomly selected gas station. (8 pts.)

- (b) Only 10% of the regular unleaded gasoline is priced less than x dollars per gallon. Find the value of x . (8 pts.)

9. Individuals with Type A personalities are characterized as being impatient, highly competitive, hostile, and aggressive. It is also argued that those with Type A personalities tend to have high blood pressures. To investigate whether they do in fact have higher blood pressures compared to the others, people were randomly selected from the two populations (Type A vs. Other) and their systolic pressures (in mmHg) were measured. The obtained data were analyzed using SPSS. The results of the analysis are shown below.

Group Statistics										
Personality Type		N	Mean	Std. Deviation	Std. Error Mean					
Systolic Pressure	Type A	11	134.45	6.788	2.047					
	Other	12	129.00	7.198	2.078					

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Systolic Pressure	Equal variances assumed	.069	.796	1.865	21	.076	5.455	2.924	-627	11.536
	Equal variances not assumed			1.870	20.978	.075	5.455	2.917	-611	11.520

For this analysis, provide a summary of the results. If necessary, use a significance level of .05. (8 pts.)

- State the null and alternative hypotheses.
- Report the test statistic.
- Report the p -value of the test.
- State the decision (reject or retain H_0).
- Interpret the results in the context of the problem.