

**STAT 301 REVIEW FOR FINAL – ANSWERS:**

1. F
2. B
3. C
4. I
5. L
6. J
7. G
8. K
9. D
10. E
11. D
12. B
13. A
14. A
15. C
16. a. Degree Days
- b. Gas Consumption.
- c. Linear, strong, positive.
- d.  $y = 0.212x + 1.094$
- e. 7.5812
- f. 0.4188
- g. 98.3%
- h.  $H_0 : \beta_1 = 0$   
 $H_a : \beta_1 \neq 0$   
 $t = 19.959$   
 $P\text{-value} = 0$   
 Reject  $H_0$ , there is a linear relationship between degree days and gas consumption in the population.
17. a. Attendance at game
- b. Points Purdue scored
- c. Linear, weak, negative.
- d.  $y = -0.000397x + 55.233$
- e. 32.8422
- f. -1.8422
- g. 37.3%
- h.  $H_0 : \beta_1 = 0$   
 $H_a : \beta_1 < 0$   
 $t = -2.783$   
 $P\text{-value} = 0.016 / 2 = 0.008$   
 Reject  $H_0$ , there is a negative association between attendance and points scored in the population.

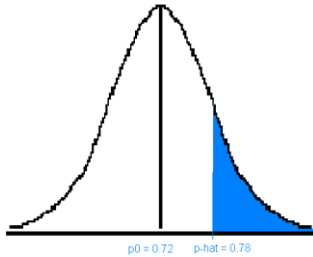
18. a.  $y = -0.000397 \cdot \text{attendance} + 55.233$   
 b.  $R^2$  does not decrease (significantly) when points opponents scored is removed from the model.  
 The t-test for points opponents scored is not significant and the test statistic for attendance is significant.  
 Standard deviation is better when points opponents scored is removed from the model.  
 Only the scatterplot for attendance at game and points Purdue scored shows a reasonable linear relationship.
19. a.  $H_0 : p_{ng} = p_g$  versus  $H_a : p_{ng} > p_g$   
 b.  $Z = 1.906$   
 c. 0.0281  
 d. Reject  $H_0$ , there is enough evidence to show that the population proportion of microbe growth is significantly higher for bare hands restaurant tortillas than for glove-wearing restaurant tortillas.
20. (0.1566, 0.19996), this is reasonable because  $n\hat{p} \geq 15$  and  $n(1 - \hat{p}) \geq 15$
21. a. 0.854  
 b. 0.232  
 c.
- |         |         |      |      |
|---------|---------|------|------|
| .01-.10 | .11-.99 | 1.0  | None |
| .168    | .361    | .199 | .272 |
- d.  $H_0$  : There is no relationship between alcohol consumption and smoking during pregnancy in the population.  
 $H_a$  : There is a relationship between alcohol consumption and smoking during pregnancy in the population.  
 e.  $\chi^2 = 42.252$ ,  $P\text{-value} = 0$   
 f. Reject  $H_0$ , there is enough evidence to conclude that there is a relationship between alcohol consumption and smoking during pregnancy in the population.  
 g. Yes, no more than 20% of the cells have expected counts less than five and none of them have expected counts less than one.
22. B  
 23. E  
 24. A  
 25. A  
 26. B  
 27. C  
 28. D  
 29. C  
 30. A  
 31. B  
 32. C  
 33. F

- 34. G
- 35. E
- 36. L
- 37. D
- 38. K
- 39. B
- 40. J
- 41. I

42. a.  $H_0 : p = 0.72$

$H_a : p > 0.72$

- b. 0.945
- c. 0.1711 or 0.1736 depending on rounding of test statistic
- d. Fail to reject the null, there is not enough evidence to show that the percentage of engineering students who push the snooze button is more than 72%.
- e. (0.6836, 0.8764)
- f.



43. a. 0.4447, conditional probability

b.  $H_0$ : There is no relationship between smoking and drinking in the population.

$H_a$ : There is a relationship between smoking and drinking in the population.

$\chi^2 = 12.845$

$P$ -value = 0.170

Fail to reject the null, there is not enough evidence to show a relationship between smoking and drinking in the population.

- c. Yes, because no more than 20% of the cells have expected counts less than 5 and none of them have counts less than one.