Unit 5 Discussion Example - First Response to a Classmate's Post

First Response: First response: Review one of your classmates' post. In the context of their hypothesis test, discuss what the Type I Error and Type II Error would mean using a Decision Table as your guide.

What level of significance would you suggest based on what a Type I Error or Type II Error would mean?

Recall that:
Type I Error is defined as rejecting the null hypothesis when in fact it should be accepted. (i.e."False Positive" , "False Alarm", defendant found guilty when in fact innocent)
Type II Error is defined as accepting the null hypothesis when in fact it should be rejected. (i.e. "False Negative", defendant found not guilty when in fact guilty)

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On May 24, 2016: Mosquito Shield Bands (made by Viatek Consumer Products Group) is a bracelet that contains mint oil and promises to protect people from mosquito bites for up to 120 hours. Viatek claims that Mosquito Shield Bands create a "vapor" barrier that can shield anyone within five feet for 96 to 120 hours.

https://www.ftc.gov/news-events/press-releases/2016/05/marketers-mosquito-shield-bands-pay-300000-barred-making

Null hypothesis, H_0: $\mu = 96$ hours
Alternate hypothesis, H_a: $\mu < 96$ hours

Type I Error: Our evidence is showing that the mean time is not 96 hours but in reality it was.
Type II Error: Our evidence is showing that the mean was 96 hours, but it really wasn't that long of protection!

Decision	**Null is True**	**Null is False**
Reject Null, P< alpha	**TYPE I Error** : You wrongly assume that the Shield Bands do not protect you for 96 hours. So, you also use other mosquito protection methods. Not a big deal!	Good decision
Cannot Reject Null, p >= alpha	Good decision	**TYPE II Error** : You wrongly assume that the Shield Bands protect you for 96 hours. You are not as protected as you think and you could be at risk of getting bitten by a mosquito. Not a good idea!

Based on the Type I error and it is not a big deal if we have this error, I would suggest a higher level of significance since we want to be really sure that our customers are not getting a product that doesn't do what it says it should do! I would choose $\alpha = 0.01$ (99% confidence level).