Phil 6014. Assignment #2: Due by March 17*

*Let me know if you need a little extra time

Do #1 and choose between #2 and #3. Submit the questions along with your answers.

In answering #2 or #3, do not assume the reader knows the answer but, rather, is looking to you for illuminating clarification of key terms. Spend time explaining them, even if it feels a little redundant. This is not an essay, just a clearly written answer to a question stated at the start. If you’re not sure about anything, please ask me.

1. Let \( X_1, X_2, \ldots, X_{225} \) be a random sample, \( n = 225 \), each from a Normal distribution with mean \( \mu \) equal to 100 and \( \sigma \) equal to 15. Suppose the assumptions of the model hold and you are testing:

\[
H_0: \mu \leq 100 \quad \text{vs.} \quad H_1: \mu > 100.
\]

(You might imagine they’re testing if there’s a higher than average mean IQ this year to decide whether to revise the standard IQ test—which of course is not measuring “innate intelligence”.)

(i) How large would the sample mean \( \bar{X} \) need to be in order to reject \( H_0 \) at the .025 level? At the .005 level?

(ii) What is the test statistic \( d(X) \) (the standard Normal \( Z \) variable)?

(iii) Fill in the following chart, but attach your work (if you use the Morey app, you might share 1 or 2 screen shots).

<table>
<thead>
<tr>
<th>( \bar{X} )</th>
<th>( Z )</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td></td>
<td></td>
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<tr>
<td>101</td>
<td></td>
<td></td>
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<tr>
<td>102</td>
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<td></td>
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<tr>
<td>103</td>
<td></td>
<td></td>
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</tbody>
</table>

(iv) Let the observed \( \bar{X} = 103 \). How severely has the data warranted \( \mu > 102 \)?

\[
\mu > 103? \quad \mu > 105? \quad
\]

Explain, in your own words, but just in a sentence or two, the reasoning behind the assessment of the severity associated with \( \mu > 105 \).

2. In approximately 2, 1.5 spaced, pages, choose some of the specific key aspects of the Fisher vs Neyman-Pearson controversy as in the “triad” (also SIST p. 388-391) to discuss. Do not try to cover more than 2-3 points, terms, criticisms and contrasting positions/responses. Give at least one quote. Why is the Fisher-Neyman dispute said to be "pathological". (If it needs to be longer, that’s fine.) The “triad” is on my blog: https://errorstatistics.com/2023/02/17/happy-birthday-r-a-fisher-statistical-methods-and-scientific-induction-with-replies-by-neyman-and-e-s-pearson/

3. In approximately 2, 1.5 spaced, pages, discuss how a severe tester proposes to demarcate the scientific credentials of an inquiry or test. Compare it to Popper’s account of demarcation, as given in the selection from Conjectures and Refutations that we read.

HAVE FUN!