As a transplant to California, I have wondered whether California residents were more or less likely to have been born in California (i.e., native Californians) back in 1950 or more recently, say in 2000. To investigate this question, I took a random sample of 500 CA residents from the 1950 Census and an independent random sample of 500 CA residents from the 2000 Census.

a) Is this an observational study or an experiment? Explain how you know.

b) Did this study make use of random sampling, random assignment, both, or neither?

c) State the appropriate null and alternative hypotheses, in words and in symbols, to address the research question in the first paragraph.

The resulting data are summarized in the table below:

<table>
<thead>
<tr>
<th></th>
<th>1950</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Born in California</td>
<td>219</td>
<td>258</td>
</tr>
<tr>
<td>Not born in California</td>
<td>281</td>
<td>242</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

d) For each year, calculate the proportion of California resident who were born in California. Use appropriate symbols to represent them. Also calculate the (absolute) difference between these proportions.

e) Produce a segmented bar graph to display the conditional proportions who were born in California in these two years. [Recall that Excel calls this a 100% stacked column graph.] Comment on what the graph, along with your calculations from (d), reveal.

f) Check the conditions for whether the normal approximation (two-proportion z-test) is appropriate here.

g) Calculate the z-test statistic and p-value based on the normal distribution.

h) What test decision would you make at the .10 significance level? What about the .01 significance level?

i) Produce a 95% confidence interval to estimate the difference in the proportion of California residents who were born in California, comparing 1950 to 2000. Also interpret what this interval reveals.
j) Summarize your conclusion from this analysis, with regard to the research question in the first paragraph.