Quiz 1

1. A study was conducted to determine urine flow of sheep (in millimeters/minute) when infused intravenously with the antidiuretic hormone ADH. The urine flows of 6 sheep are recorded here.

0.9, 0.5, 0.6, 0.4, 0.9, 1.2

(a) (15 points) Determine the mean of the sample.
\[ \bar{x} = \frac{0.9 + 0.5 + 0.6 + 0.4 + 0.9 + 1.2}{6} = 0.75 \]

(b) (15 points) Determine the mode of the sample.
\[ x_{\text{mode}} = 0.9 \]

(c) (15 points) Compute the median of the sample.
0.4 0.5 0.6 0.9 0.9 1.2
\[ x_{\text{median}} = \frac{0.6 + 0.9}{2} = 0.75 \]

(d) (15 points) Please indicate whether the following statements are true (T) or false (F).

(T) If the largest measure is 7.0 instead of 1.2 the mean increases.
(F) If the largest measure is 7.0 instead of 1.2 the mode increases.
(F) If the largest measure is 7.0 instead of 1.2 the median increases.

2. The following data are taken from a study investigating the use of a new technique as a diagnostic test for detecting a disease.

<table>
<thead>
<tr>
<th></th>
<th>Disease is present</th>
<th>Disease is absent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Test</td>
<td>500</td>
<td>100</td>
<td>600</td>
</tr>
<tr>
<td>Negative Test</td>
<td>700</td>
<td>1000</td>
<td>1700</td>
</tr>
<tr>
<td>Total</td>
<td>1200</td>
<td>1100</td>
<td>2300</td>
</tr>
</tbody>
</table>

(a) (20 points) Compute the sensitivity of the test.
\[ P(T^+| \text{Disease is present}) = \frac{500}{1200} \]

(b) (20 points) Compute the specificity of the test.
\[ P(T^-| \text{Disease is absent}) = \frac{1000}{1100} \]