Interpreting Z Statistics Practice

See page 2 for detailed answers

1. The grades on a statistics mid-term for a class at UCSD are normally distributed with a mean of 81 and a standard deviation of 6.3. Calculate the Z-scores for each of the following exam grades. Gram and label a sketch for each example.
   a. 65
   b. 83
   c. 93
   d. 100

2. For the numbers below find the percent of cases falling ABOVE the z.
   a. Z=0.24
   b. Z=-1.11
   c. Z=1.22
   d. Z=-2.07

3. For the numbers below find the percent of cases falling BELOW the z.
   a. Z=2.24
   b. Z = -1.65
   c. Z=1.47
   d. Z=-0.47

4. A survey is conducted in one European Union nation about newly re-elected US president Barack Obama. One of the items in the survey asks the respondents to rate their feelings toward the US president on a scale from 0 (very cold/negative) to 100 (very positive/warm). The distribution of data is surprisingly normal. The calculated values for the 600 individuals sampled are as follows:
   Mean=70.4 degrees
   Standard Deviation=9.6 degrees
   a. What percentage of respondents gave President Obama a scale rating ABOVE 85 degrees?
   b. What percentage gave him a rating BELOW 65 degrees?
1.  
   a. $Z = (63-81)/6.3 = -2.54$
   b. $Z = (83-81)/6.3 = 0.32$
   c. $Z = (93-81)/6.3 = 1.90$
   d. $Z = (100-81)/63 = 3.02$

2.  
   - percent = 40.52
   - percent = 86.65
   - percent = 11.12
   - percent = 98.08
3. 

<table>
<thead>
<tr>
<th>Value</th>
<th>Percentile Rank</th>
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<tbody>
<tr>
<td>85</td>
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<td>96</td>
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<td>96</td>
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</table>

\[ Z_i = \frac{85^\circ - 70.4^\circ}{9.6^\circ} = \frac{+14.6^\circ}{9.6^\circ} = 1.52 \]

A Z of 1.52 corresponds to the 93.57th percentile (50+43.57). 6.43% of the respondents (100-93.57) gave the president a rating above that.
b. \[ Z_t = \frac{65^\circ - 70.4^\circ}{9.6^\circ} = \frac{-5.4^\circ}{9.6^\circ} = -0.56 \]

28.77\% of all respondents (50-21.23) gave the president a rating below that.