1. Consider the following summer ground temperatures (°F) taken in Death Valley.

144 146 152 152 165 168 168
174 178 178 178 179 180 180

Note that \( \sum x = 2342 \) for this data, and then find

(a) the mean is \( \frac{2342}{14} \approx 167.29 \).

(b) the median is in the 7.5th place of the ordered data, so the median is \( \frac{168 + 174}{2} = 171 \).

(c) the mode is the most common data which is 178.

2. (a) If each of the data in 1. were increased by 10, how would that change the mean, median and mode of the data?

Answer. Each would decrease by 10. So the mean would be 157.29; the median would be 161 and the mode would be 168.

(b) What if lowest number was decreased by 100 (because of a data entry error) in 1, how would that change the mean, median and mode of the data?

Answer. The median and mode would remain unchanged, the mean would decrease by 100/14. The new mean would be \( \frac{2242}{14} \approx 160.14 \).

3. On-time percentages are given for two airlines in Phoenix, Los Angeles and Seattle for 2006.

<table>
<thead>
<tr>
<th>Crashcade Airlines</th>
<th>Los Angeles</th>
<th>Phoenix</th>
<th>Seattle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Fights</td>
<td>1000</td>
<td>500</td>
<td>3500</td>
</tr>
<tr>
<td>On time %</td>
<td>90</td>
<td>95</td>
<td>85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pacific Worst Airlines</th>
<th>Los Angeles</th>
<th>Phoenix</th>
<th>Seattle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Fights</td>
<td>250</td>
<td>4500</td>
<td>250</td>
</tr>
<tr>
<td>On time %</td>
<td>85</td>
<td>90</td>
<td>80</td>
</tr>
</tbody>
</table>

(a) Calculate the on-time percentage average for these three cities for each airline. Do this as a weighted average where the weight for each airline and city is the number of flights.

Answer. For Crashcade we compute

\[
\frac{\sum xw}{\sum w} = \frac{(1000)(90\%)+(500)(95\%)+(3500)(85\%)}{1000+500+3500} = \frac{435,000}{5000} = 87\%
\]

For Pacific Worst we compute

\[
\frac{\sum xw}{\sum w} = \frac{(250)(85\%)+(4500)(90\%)+(250)(80\%)}{250+4500+250} = \frac{446,250}{5000} = 89.25\%.
\]
You should get the same answer if you computed this as follows (we illustrate with Crashcade): Out of Los Angeles, 90% of 1000 flights = 900 flights were on time, out of Phoenix, 95% of 500 = 475 flights were on-time, out of Seattle 85% of 3500 = 2975 flights were on time. Therefore, Crashcade had a total of 900 + 475 + 2975 = 4350 out of 5000 flights on time, which is 87%.

(b) Given that the on-time percentage for Crashcade Airlines is 5% higher in each city, does the answer in (a) surprise you? Why or why not?

**Answer.** On the surface it is very surprising that Pacific Worst has a better overall on-time percentage. However, this happens because Pacific Worst’s schedule is heavily weighted to flights in Phoenix where they have their best on-time percentage, whereas Crashcade’s flights are heavily weighted in Seattle where they have their worst on-time percentage.