Example

Find the mean and standard deviation for the set of grouped data.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 – 3.5</td>
<td>6</td>
</tr>
<tr>
<td>3.5 – 5.5</td>
<td>1</td>
</tr>
<tr>
<td>5.5 – 7.5</td>
<td>3</td>
</tr>
</tbody>
</table>

**SOLUTION:**

Since the midpoints of the intervals are 2.5, 4.5, and 6.5, then the mean is:

\[
\bar{x} = \frac{(2.5)(6) + (4.5)(1) + (6.5)(3)}{6 + 1 + 3} = \frac{39}{10} = 3.9
\]

The standard deviation is

\[
s = \sqrt{\frac{\sum_{i=1}^{k} (x_i - \bar{x})^2 f_i}{n - 1}},
\]

where \( k = 3 \) since there are 3 classes and \( n = 10 \) since there are \( 6 + 1 + 3 = 10 \) measurements. Also, \( x_1, x_2, x_3 \) are the midpoints of the 3 intervals; \( \bar{x} \) is the mean; and \( f_1, f_2, f_3 \) are the frequencies corresponding to the intervals. So then the standard deviation is:

\[
s = \sqrt{\frac{(2.5 - 3.9)^2(6) + (4.5 - 3.9)^2(1) + (6.5 - 3.9)^2(3)}{10 - 1}}
\]

\[
= \sqrt{\frac{(-1.4)^2(6) + (0.6)^2(1) + (2.6)^2(3)}{9}}
\]

\[
= \sqrt{\frac{32.4}{9}}
\]

\[
\approx 1.8974
\]