Stats: Homework#3 Solutions

Use the TI calculator to do all of the following problems:

#1 Find the 1-var stats for the following data set
{2.34, 5.67, 8.93, 5.46, 17.34, 3.99, 41.12, 23.19, 31.78, 67.35, 23.56, 25.89, 37.12, 21.34, 37.11, 35.65, 45.26, 78.25, 21.55, 43.23, 78.45, 28.42}.
Draw a box and whisker display.
\[ 
\bar{x} = 31.04545455 \\
\sum x = 683 \\
\sum x^2 = 31411.9928 \\
s_x = 22.04751076 \\
\sigma_x = 21.54060367 \\
n = 22 \\
\min x = 27.155 \\
Q_1 = 17.34 \\
\text{med} = 27.155 \\
Q_3 = 41.12 \\
\max x = 78.45 
\]

#2 Find the 1-var stats for the following frequency distribution:

\begin{align*}
  f & : 7 & 4 & 11 & 8 & 5 & 4 & 1 & 7 & 2 & 18 & 5 & 3 & 9 & 15 & 10 & 11 & 20 & 8 & 23
\end{align*}

Draw a box and whisker display.
\[ 
\bar{x} = 20.67251462 \\
\sum x = 3535 \\
\sum x^2 = 118121 \\
s_x = 16.27767522 \\
\sigma_x = 16.23000989 \\
n = 171 \\
\min x = 3 \\
Q_1 = 9 \\
\text{med} = 15 \\
Q_3 = 24 \\
\max x = 65 
\]
#3 Find the LinReg Stats for the following bivariate data:

\[ \begin{align*}
x & : 1.1 \quad 2.5 \quad 4.5 \quad 3.7 \quad 5.65 \quad 11.1 \quad 15.26 \quad 12.19 \quad 25.83 \\
y & : 5.91 \quad 8.85 \quad 13.05 \quad 11.37 \quad 15.465 \quad 26.91 \quad 35.646 \quad 29.199 \quad 57.843 \\
\end{align*} \]

What can you say about the BFL?

Draw the scatter plot and the BFL on the same grid.

LinReg

\[ y = ax + b \]

\[ a = 2.1 \]

\[ b = 3.6 \]

\[ r^2 = 1 \]

\[ r = 1 \]

The BFL is a perfect fit, since \( r^2 = 1 \).

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#4 Researchers compared some of the most popular fast-food items in calories and fat and got the following data:

<table>
<thead>
<tr>
<th>Calories (x)</th>
<th>245</th>
<th>347</th>
<th>240</th>
<th>440</th>
<th>145</th>
<th>335</th>
<th>245</th>
<th>325</th>
<th>449</th>
<th>438</th>
<th>342</th>
<th>445</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat (y) (in gms)</td>
<td>19</td>
<td>24</td>
<td>18</td>
<td>25</td>
<td>14</td>
<td>28</td>
<td>22</td>
<td>24</td>
<td>33</td>
<td>31</td>
<td>27</td>
<td>32</td>
</tr>
</tbody>
</table>

(a) Draw a scatter diagram of this data. Make sure to label your diagram and indicate scales on the axes.

(b) Find the slope and intercept of the best-fit-line (BFL). Draw the BFL along with the scatter diagram.

(c) Calculate the correlation coefficient, \( r \). Is the best-fit line a good fit? Why?

(d) Using the BFL as a model predict the number of grams of fat in a fast food that had 300 calories.
slope = .0542105263  \hspace{1cm} \text{intercept} = 6.697894737

It's a good fit because \( r^2 = .8414276272 \geq .5 \)

Part(d) 22.96105263