Using the TI-83/TI-84 Plus Family of Calculators to Determine the Linear Regression Equation for a Set of Paired Data Values

Example 1:

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

Enter the data into the calculator as follows:

1. Press **STAT** and choose **EDIT**.

2. The calculator has six built-in lists, L1, L2, ..., L6. If there is data in L1, clear the list as follows:
   a. Use the arrows to place the cursor on L1 at the top of the list. Press CLEAR followed by ENTER, followed by the down arrow.
   b. Follow the same procedure to clear L2 if necessary.
   c. Enter the input values into L1 and the corresponding output values into L2.
To see a scatterplot of the data proceed as follows.

1. STAT PLOT is the 2nd function of the \( \text{Y=} \) key. You must press \( \text{2nd} \) before pressing \( \text{Y=} \) to access the STAT PLOT menu.

2. Select Plot 1 and make sure that Plots 2 and 3 are Off. The screen shown below will appear. Select On and then choose the scatterplot option (first icon) on the Type line. Confirm that your \( x \) and \( y \) values are stored, respectively, in \( \text{L}_1 \) and \( \text{L}_2 \). The symbols \( \text{L}_1 \) and \( \text{L}_2 \) are 2nd functions of the \( \text{1} \) and \( \text{2} \) keys, respectively. Finally, select the small square as the mark that will be used to plot each point.

3. Press \( \text{Y=} \) and clear or deselect any functions currently stored.

4. To display the scatterplot, have the calculator determine an appropriate window by pressing \( \text{ZOOM} \) and then \( \text{7} \) (ZoomStat).

The following instructions will calculate the linear regression equation and store it in \( Y_1 \).

1. Press \( \text{STAT} \) and right arrow to highlight CALC.
2. Choose 4: LinReg \((ax + b)\). LinReg \((ax + b)\) will be pasted to the home screen. To tell the calculator where the data is, press \(\text{2nd}\) and \(1\) (for L1), then \(\text{+}\), then \(\text{2nd}\) and \(2\) (for L2) because the Xlist and Ylist are stored in \(L_1\) and \(L_2\), respectively. The display should look like this:

![Image of calculator screen]

3. Press \(\text{+}\) and then press \(\text{VARS}\).

![Image of calculator screen]

4. Right arrow to highlight Y-VARS.

![Image of calculator screen]

5. Choose 1, FUNCTION.

![Image of calculator screen]

6. Choose 1 for \(Y_1\) (or 2 for \(Y_2\), etc. if you prefer to store the regression equation in another location).

![Image of calculator screen]

7. Press \(\text{ENTER}\).

![Image of calculator screen]

The linear regression equation for this data is \(y = 1.6x - 1.2\).
8. To display the regression line on the scatterplot screen, press \textbf{GRAPH}.

9. Press the \textbf{Y=} key to view the equation.

\begin{verbatim}
Y1 = 1.6x - 1.2
Y2 =
Y3 =
Y4 =
Y5 =
Y6 =
Y7 =
\end{verbatim}