Regression Analysis on a TI-82, 83, or 84 Graphing Calculator

1. **Clear Old Data**  [Omit Step 1 if there is no old data in L1 and/or L2.]
   
   STAT  1:Edit  ▲ (highlight L1)  Clear  Enter  ▼  ▲ (highlight L2)  Clear  Enter  ▼

2. **Enter Data**
   
   STAT  1:Edit  (Enter input (x) values in L1 and output (y) values in L2.)  Make sure every entry is correct.

**Example:**
Average annual tuition and fees for in-state students at public 4-year colleges for selected years are shown in the table. Using \( x = 0 \) for 1990, enter the x-values (years since 1990) in L1 and the y-values (tuition and fees) in L2.

<table>
<thead>
<tr>
<th>Year</th>
<th>Years since 1990 (x)</th>
<th>Tuition &amp; Fees (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>0</td>
<td>2035</td>
</tr>
<tr>
<td>1994</td>
<td>4</td>
<td>2820</td>
</tr>
<tr>
<td>1996</td>
<td>6</td>
<td>3151</td>
</tr>
<tr>
<td>1998</td>
<td>8</td>
<td>3486</td>
</tr>
<tr>
<td>2000</td>
<td>10</td>
<td>3774</td>
</tr>
</tbody>
</table>

3. **Create a Scatter Plot of the Data**
   
   \( y = \text{CLEAR} \) (Clear out or turn off any equations.)
   
   2nd  y =  1:Plot 1  (to select Plot 1)  Enter (to turn Plot 1 on)
   
   ZOOM 9:ZoomStat

4. **Run Regression**
   
   STAT  ►  CALC
   
   select appropriate regression  LinReg (ax + b)  QuadReg  CubicReg  QuartReg  etc.
   
   Enter (to execute regression analysis)

   LinReg
   
   \( y = ax + b \)  
   
   \( a = 174.3986486 \)  
   
   \( b = 2076.567568 \)  
   
   If given, record the correlation coefficient, \( r \) (do not round).
   
   \( r^2 = .9961354296 \)  
   
   \( r = .9980658443 \)  
   
   (We will not be using \( r^2 \), the correlation of determination.)
   
   Tell the goodness of fit (The closer \( r \) is to 1 or -1, the better the fit).
   
   Very good fit

**TI-83 and TI-84 users**
If you do not see \( r \) and \( r^2 \), do the following: Press 2nd 0 (catalog) and scroll down until you see DiagnosticOn. Hit enter to select that command and then hit enter again to execute it. Run the regression again. You should now see \( r \) and \( r^2 \).

5. **Graph the Model with the Data**
   
   \( y = \text{VARS}  5:\text{Statistics}  ►►  \text{RegEQ}  \text{GRAPH} \)
   
   Create an accurate sketch of the model with the data.
   
   If the type of regression you ran does not give a correlation coefficient, you can access the goodness of fit by examining the graph of the model with the data. The more data points the model goes through or touches, the better the fit.

6. **To Find the Output for a Specified Input**
   
   2nd  Graph  (Table)  Enter appropriate input.
   
   For example, by plugging in 18 we can get the projected cost of tuition and fees in 2008.
   
   \( y(18) = $5215.70 \)

7. **Turn the Plotter Off**
   
   2nd  y =  4  Enter  (It should say PlotsOff  Done.)