1. (5 points) Write a program that reads a list of numbers (on separate lines) until end-of-input and then prints for each number the corresponding faculty member’s name according to the following list:

   1 = Andereck, 2 = Dillman, 3 = Harmon, 4 = Kaye, 5 = Krause, 6 = Trees

   Hardcode the list of names into your program. (That is, the list should appear in your program’s source code.) For example, if the input numbers were 1, 2, 4, and 2, the output names would be Andereck, Dillman, Kaye, and Dillman (each on a separate line).

2. (5 points) Write a program that calculates the volume of a sphere given a radius that is obtained from the program user. Include the provision that if the user enters a negative number for the radius, the program reports a volume of zero, rather than a negative number.

3. (10 points) Write a program to print a table (to the computer screen) showing the conversions between the Celsius and Fahrenheit temperature scales for a set of input Celsius temperatures. The beginning and ending Celsius temperatures, along with the temperature increment, should be input by the program user.

4–9. (5 points each) Write programs that automate Problems 5–10 in the “Error Analysis Exercises” assignment, i.e., that provide the solutions to the problems for any arbitrary value of the given measured quantities. Each program should either ask for the measured quantities through user input, or read the measured quantities and their uncertainties from an existing file. Note that the program for Problem 5 should calculate a weighted average for any arbitrary uncertainty associated with each measurement.

10. (15 points) Write a program that determines the slope and y-intercept of a linear fit to the following set of (x,y) data points using the method of least squares. Assume uniform uncertainties $\sigma_i = 1.5$ in $y_i$. Also calculate $\chi^2$ for the fit and the uncertainty in the slope and y-intercept of the best-fit line. Then plot the data using EasyPlot and perform a linear curve fit to the data. Be sure to show the fit parameters (slope, y-intercept) and their uncertainties, as determined by EasyPlot, on the graph.

Data:

<table>
<thead>
<tr>
<th>$x_i$</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y_i$</td>
<td>0.0</td>
<td>5.3</td>
<td>14.4</td>
<td>20.7</td>
<td>30.1</td>
<td>35.0</td>
<td>41.3</td>
<td>52.7</td>
<td>55.7</td>
<td>63.0</td>
<td>72.1</td>
<td>80.5</td>
<td>87.9</td>
</tr>
</tbody>
</table>