Programming a Water Level Calculator

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Field data are analyzed in order to see the relationship between the depth of wells and water levels in four wells in our study area. A plot of the average depth below the ground level versus average water level in each well was made. A linear regression equation was derived from the best fit line and its inverse used to write a program (water calculator) that will take either type of data as an input, and will return the resulting value of the other type of data. This water calculator can then be used to simulate the water level in any drilled well within the study area. Once the simulated water level has been verified in the field, the calculator could then be used to predict water levels in any well within the study area.

The water calculator interface consists of two sides. On the left side of the interface is an area for data input, which would be the known piece of data. A simple text field is used to allow the user to input the data value (which will halt the program if the inputted value is a non-numerical value, or out of range). A drop down "combo box" allows the user to select which type of data he or she is entering. The proper equation is then selected to find the resulting type of data, based on the selection the user has made in the combo box. After the input has been entered, a press of the "Calculate" button will make the calculations. The numerical results, as well as a short description of what the resulting output represents, are then printed on labels on the right side of the interface, under the "Output" section. Also displayed is a graphical representation of what the inputted and outputted data represent, including the pipe, ground level, and internal water level. This visual depiction should help the user better understand what the numerical inputs and outputs really represent. This program would help students in understanding the relationship between well depth and well water levels.