CS118 Programming Assignment
Resistors 2

[Credit to: An Introduction to Technical Problem Solving with MATLAB v.7, Sticklen and Eskill]

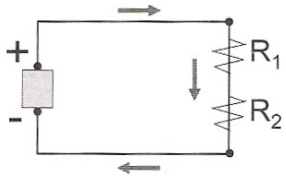
This program is NOT the same as your original Resistors program – there are some significant differences, including the fact that we're introducing lists to it. ["Resistors, I'd like you say hello to Lists." :-)]

For this program, we're going to introduce some standard dialog boxes. These are pre-formatted windows which allow a simple graphical user interface (GUI). For this we must import three modules: `Tkinter`, `tkMessageBox`, and `tkSimpleDialog`. (Please note the mix of cases on the names of these modules.) Most standard dialogs require two arguments: A title string, and then a message or prompt string.

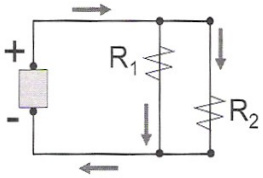
When making a GUI-oriented program a "root" window has to be constructed. But since it gets in the way, we don't want to see it. This code will start this root window and then hide it – put it at the very beginning of your program:

```
root = Tkinter.Tk()
root.withdraw()
```

Resistors in a circuit can be organized in *series* or in *parallel*. The diagrams below show the difference:



resistors in series



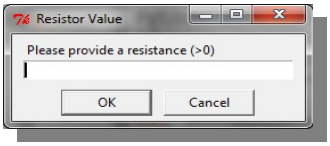
resistors in parallel

In the case of series resistors, the *effective resistance* is simply the sum of the individual resistors. For parallel resistors, the effective resistance is computed as:

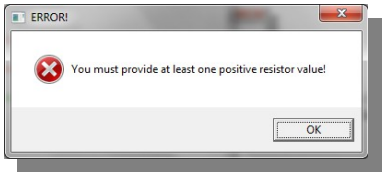
$$R_{eff} = \frac{1}{\sum_{k=1}^{n} \frac{1}{R_k}}$$

where R_k is the resistance of resistor *k*.

Write a Python script that computes the effective resistance for **parallel** resistors only. Collect values for resistors via the `askinteger()` function storing the values in a list, `R`, by making use of the `append()` method.



You may assume the user will only provide positive, non-zero values for the resistors – except for the last value. Only collect resistors until the user provides a negative or zero value for a resistor. (Naturally, that value will not be included in the list.) If the user provides no useful resistor values, use the `showerror()` dialog from the `tkMessageBox` module to display an error message.



If the user does provide some useful values, use the list `R` to compute the effective resistance and save it as `Reff`. Report `Reff` to three decimal places using `showinfo()` by making use of the format string syntax.