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Algorithm for Homework 1

To begin, we must take note of a couple of things: we will need to define a variable and store the input of the user to that variable for the original Carnot efficiency and the improved Carnot efficiency. Then we will have to perform some arithmetic with the variables in order to get the temperature that the hot reservoir needs to increase by.

We first must notice that the inputs for both Carnot efficiencies need to be doubles, since we will be taking the input as the form of a decimal (and possibly may need to include many places past the decimal). We should set the cold reservoir temperature to be an int, since we know that that will be inputted as an integer. Finally, we will set the hot reservoir temperature to be a double, as we require the decimal places for the output.

We need to create a set of cout statements for the user to be able to know what to input. Then we must cin the value that the user inputs to store to that variable. Next, we can both declare and initialize the variable at the end, hotReservoir, by using the equation $\Delta T_h = \frac{T_c}{1 - n_2} - \frac{T_c}{1 - n_1}$. Since we are taking the input for cold reservoir temperature in degrees Celsius, we need to add 273.15 to T_c in the equation. Finally, we need a cout statement to let the user know how much the temperature of the hot reservoir needs to go up by. A step-by-step flow chart is shown on the next page.

