

ICS 103, Term 132

Computer Programming in C

HW# 2

Due date: Tuesday, March 4, 2014

- Q.1.** The table below shows the normal boiling points of several substances. Write a program that prompts the user for the observed boiling point of a substance in °C and identifies the substance if the observed boiling point is within 5% of the expected boiling point. If the data input is more than 5% higher or lower than any of the boiling points in the table, the program should output the message Substance unknown.

Substance	Normal boiling point (°C)
Water	100
Mercury	357
Copper	1187
Silver	2193
Gold	2660

Your program should define and call a function, **within_x_percent**, that takes as parameters a reference value *ref*, a data value *data*, and a percentage value *x* and returns 1 meaning true if *data* is within *x* % of *ref* —that is, $(ref - x\% * ref) \leq data \leq (ref + x\% * ref)$. Otherwise, the function **within_x_percent** would return zero, meaning false. For example, the call **within_x_percent**(357, 323, 10) would return true, since 10% of 357 is 35.7, and 323 falls between 321.3 and 392.7.

Test your program by applying 10 different inputs, where two inputs are related to one substance type such that for one input the substance is identified and for another it is not.

The solution should be well organized and your program should be well documented. Submit a soft copy of your solution in a zip file. Your solution should be submitted in a word file that contains the following items:

- i) *Your name and ID*
- ii) *Homework number*
- iii) *Problem statement*
- iv) *Your solution along with the code*
- v) *Discussion of what worked and what did not work in your program. Include snapshots that demonstrate the working parts of your program. If things did not work and you attempted to solve them, mention that and write about the difficulty that you have faced.*

The soft copy should also contain the source code file (i.e. .c) and the executable (i.e. .exe).