

# CS130 Lab Exercise #10 – Floating-Point Numbers

## Requirements

Since solutions to this assignment may be readily found on ‘Al Gore’s’ Internet, you must show in detail the steps you took to arrive at each answer. Hint: An old proverb goes something akin to “No [complete] detailed work? No credit!”

For this exercise, enter your work in a text editor such as “Notepad”. Do NOT submit work created in a word processor or in a “.PDF” format file creator. To ensure that your work is properly credited, name your file in the format **YourLastName Lab Exercise 10.Txt** where **YourLastName** is your name as it appears on the roster. I’m sorry, but the last names “Lab”, “CS130” and “Exercise” have all been taken previously by students unwilling to follow directions! How selfish of them, for sure!

## Problems

1. Expressed as a decimal, what is the value of the **single-precision** hexadecimal number **40 1A A0 00**?
2. Expressed as a decimal, what is the value of the **double-precision** hexadecimal number **40 1A A0 00 00 00 00 00**?
3. Expressed in hexadecimal, what is the **single-precision** representation of the (decimal) number **6.65625**?
4. Expressed in hexadecimal, what is the **double-precision** representation of the (decimal) number **6.65625**?
5. (a) Express **26.125** and **0.4150390625** as binary numbers.  
(b) Add them and express the sum as a binary number.
6. Expressed in hexadecimal, what is the **single-precision** representation of the sum from (5b)?
7. Expressed in hexadecimal, what is the **double-precision** representation of the sum from (5b)?
8. (a) Express **1313.3125** and **0.1015625** as binary numbers.  
(b) Add them and express the sum as a binary number.
9. Expressed in hexadecimal, what is the **single-precision** representation of the sum from (8b)?
10. Expressed in hexadecimal, what is the **double-precision** representation of the sum from (8b)?
11. (a) Express **2345.34375** and **2345.3984375** as binary numbers.  
(b) Subtract them and express the difference as a binary number.
12. Expressed in hexadecimal, what is the **single-precision** representation of the difference from (11b)?
13. Expressed in hexadecimal, what is the **double-precision** representation of the difference from (11b)?

Suggestion: Refer to Page 3 of the document “[zyBooks on Scientific Notation.PDF](#)” as well as the document “[Regarding Floating-Point Notation.PDF](#)” (especially Page 7) for help with this assignment.