

CSCE 155 - Lab 2.0 - Data Types - Worksheet

Names: _____

1. Dennis Ritchie, the creator of the C programming language, was born on September 9th, 1941. If he were still alive, how old would he be today? Find out by running the `birthday` program on the appropriate inputs.
2. Bjarne Stroustrup, the creator of the C++ programming language, the object-oriented extension of C, was born on December 30th, 1950. How old is he today?
3. Software testing often involves testing code with known “bad” input in an attempt to break it (sometimes this is referred to as fuzzing). Try breaking the `birthday_cli` program by giving it “bad” input and observe the consequences. Give at least two examples of potentially bad input and the results.
4. Complete all the size and range entries in the table below

| Type | Description | Size (bytes) | Range |
|------------------------|-----------------------------------|--------------|---|
| <code>char</code> | Single character or small integer | 1 | Signed: -128 to 127 Unsigned: 0 to 255 |
| <code>short int</code> | “short” integer | | |
| <code>int</code> | integer | | |
| <code>long int</code> | “long” integer | | |
| <code>float</code> | 32-bit floating point number | | (7 digits precision) |
| <code>double</code> | 64-bit floating point number | | (15 digits precision) |

5. Demonstrate your working currency conversion program to an instructor; use it to determine the exchange amounts for the following inputs:
 - (a) \$250.25
 - (b) \$1,000.52
 - (c) \$968,410.12
6. Suppose that you had used only `int` types in your conversion program. Would you be able to use it to convert the US national debt (which as of 2018 was \$20,804,998,625,487)? Why or why not?
7. Mixed types
 - (a) Run the `area` program from with 3 and 4 as inputs. What value do you get? Is this result correct?
 - (b) Execute the program again with inputs 3 and 5. Does the program give correct results? Why not?
 - (c) Fix the program by editing the `area.c` source code so that the program produces correct results. Hand your program in using webhandin and grade it using webgrader. Demonstrate your output to a lab instructor, have them sign this worksheet and turn it in.

Lab Instructor Signature_____