CSI 32 LECTURE NOTES (Ojakian)

Topic 1: Declarations, types, input, output

OUTLINE

References (*skip "references" and "pointers" and "arrays" and loops and conditional statements*):
PRIMER: Sections 1.2, 1.3, 2.1, 2.2, 2.4, 3.2, 4.1, 4.2, 4.3
TRANSITION GUIDE: Sections 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5

1. Course Issues
2. Declarations, types in C++
3. Input and Output in C++

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1. Starting up ...
   (a) Get Codelab and Dropbox set up.
   (b) You should have Python installed. Also install the C++ Code::Blocks IDE.
   (c) Start HW 0 in Dropbox.
2. Plan for beginning of course
   (a) **We'll proceeed to discuss Python and C++, emphasizing their similarities at first ...**
   (b) Do lots of small programs.
   (c) No "classes" yet.
   (d) Detailed C++ background later! (arrays, pointers, references, memory management, etc)
3. Libraries and modules

   Your programs in this course should generally work without using outside libraries, etc.
   (a) Can import modules into Python. For us we will mostly need to import nothing
   (b) For C++, can include libraries.
      i. We will almost always want to include `iostream` for input and output.
      ii. Often include `string` for working with strings.
      iii. Sometimes include `typeinfo` to get the types of data.
      iv. Sometimes include `vector` or `list` when needed.
4. Jupyter versus Compiler
   (a) Jupyter is easy to use interactive environment - not need be a complete program (.ipynb Notebook file)
   (b) Can create complete program as source code (.cpp source code file)

5. Data types

   (a) Statically Typed versus Dynamically Typed

      i. Declare variables first (not done in Python).
      ii. Then define (... or simultaneously do both)
      iii. String: not a built in C++ type (need to include "string")
      iv. Get type info:
         A. In Python: Use command `type(BLAH)`
         B. In C++: Include `typeinfo` and use `typeid(BLAH).name()` to get string description.
      v.

      PROBLEM 1. *Write Python and C++ examples. Get the types. And try changing the types.*

6. User input and output

   (a) Python: `print` and `input`

   (b) C++: `cout` and `cin`

   (c)

   PROBLEM 2. *Write a program to get a first number and then a second number, and print out their sum.*

7. More on data types and expressions

   (a) Expressions - numerical and boolean; and type conversion

   PROBLEM 3. *Consider the Python and C++ expressions in the two "Topic 1 Basics" programs. What is printed?*