CS 161
Intro to CS I

Beginning to Program
More C++

• Escape Sequences
  – Display special characters
  – Use backslash, \, before special character to print

• Examples:
  std::cout << "\"Hello World\"\n";

• Refer online for common escape sequences:
Data Type

• What is data?
  – Information
  – Ex: std::cout << “Hello World!” << std::endl;
  – Simple value
    • Literals, e.g. 23, 79.5, “Hello”, etc.

• What is a data type?
  – Description of the kind of information
    • Primitive Data
    • User Created/Data Structures – (we will cover later)
C++ Primitive Types

- char, double, float, int, long, short, bool
- Fundamental
  - int: whole numbers, e.g. 45, -89, 0
  - double: real numbers, e.g. 2.612, -30.5, 2.3e5
  - char: characters, e.g. ‘A’, ‘&’, ‘x’, ‘\’
- Signed and Unsigned

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Variables

• What is a variable?
  – Memory location with name and type to store value

• What is a declaration?
  – Statement requesting variable w/ name and type
  – Examples:
    double height;
    int age;
Variables/Identifiers

• Identifier: name given to item in program
  – Ex. Variables and Functions
  – Start with letter
    • Letters include: upper-case, lower-case, underscore (_)
  – Followed by sequence of letters and digits
  – Good examples: hiThere, two_plus_two, _hello
  – Bad examples: 5dogs, hi-there, hello there

• Can’t Use Keywords:
  http://en.cppreference.com/w/cpp/keyword
Variables

• How do we get a value in the variable?
  – Assignment Statement
    int age;
    age = 20;
    Or
    int age = 20;
  – = IS NOT equal to!!!!!
  • “gets” or “is assigned”
Printing Variables/Reading Into Variables

- **C++: cout**
  - Example:
    ```cpp
    std::cout << "The integer value is: " << value;
    ```
  - What about the newline?

- **C++: cin**
  - Example:
    ```cpp
    std::cin >> value;
    ```
```cpp
#include <iostream>
#include <iostream>
using namespace std; //need std:: in front of cout and endl without this

int main() {
    int age; //creates space to store whole number/integer named age
    float remainder; //create space to store real/ floating point number

    //not good to have a cin without a prompt informing the user of what
    //to enter!!!! You should always have a prompt before cin!!!
    cin >> age; //read value from user and store it in space named age
    cout << "Your age is: " << age << endl; //fetch value in age and print
    cin >> remainder; //after reading an integer, read a float
    cout << "Your remainder is: " << remainder << endl;

    cout << "hello"
        " everyone" << endl;

    return 0;
}
```
flip3 ~/cs161/private 155% g++ hello.cpp
flip3 ~/cs161/private 156% a.out
4.6
Your age is: 4
Your remainder is: 0.6
hello everyone
flip3 ~/cs161/private 157% a.out
4
Your age is: 4
.6
Your remainder is: 0.6
hello everyone
flip3 ~/cs161/private 158%  