CS 161
Intro to CS I

Strings, cin, and errors
Finish C++ String Demo

• What does cin do when reading...
  – Int/Floats
  – Strings

• What does getline do?
```cpp
#include <iostream>
using namespace std;

int main() {
    int x;
    float f;

    // Not a good way to handle errors because 4.6, 4t, etc. will work
do {
        if(cin.fail()) {
            cin.clear(); // reset failbit
            cin.ignore(256, '\n'); // ignore 256 chars or until newline
        }
    } while(cin.fail()); // fail bit set if it doesn't get type expected

    cout << "enter int: ";
    // cin ignores leading whitespace and reads until char not of
    // the type specified or whitespace (newline, space, tab, etc.)
    cin >> x;
    cout << "value of x: " << x << endl;
}
```
More cin Demo...
More about break, exit, and return

• **break** – used with switch and loops, breaking out of the closest associated case or loop (for, while, or do while). This statement can only occur in a loop or case, otherwise the compiler yells!

• **return** – leave the current function, which exits the program when in the main() function. You can put this anywhere inside any function, otherwise the compiler yells!

• **exit()** – exit the entire program, no matter where this is encountered. You can put this anywhere inside any function, as long as you include `<cstdlib>`, otherwise the compiler yells!
Programming Errors

• Syntax errors
  – Misuse of C++ language
  – How are they caught?

• Logic errors
  – Doesn’t perform task correctly (aka. bugs)
  – How are they caught?

• Runtime errors
  – Stops your program from running
  – How are they caught?
Syntax Error Examples

- Missing main function
- Use of identifier not declared
- Misspelled Words
- Forget a Semicolon
- Forget Required Keyword
- Missing quote, curly brace, and parenthesis
- Use of single quotes instead of double
Logic Error Examples

• Poorly written programs
  – Add instead of subtract (incorrect operation)
  – Using last two digits for date
  – Same error message for different errors
  – Program that never ends
  – Add one to the largest integer (could be syntax)
Runtime Error Examples

• Segmentation fault or Core dump
  – Read a file that doesn’t exist
  – Go outside of memory bounds
  – Infinite loop that eats memory
  – Divide by variable that is zero
Debugging Errors

• Syntax:
  – READ compiler errors (pay attention to line #)
  – Use google to search for error

• Logic/Runtime
  – Use std::cout to find where the code is breaking
    • Print variable values
    • Print indicator messages
  – Trace through the code
  – Comment out code
Demo...