CS 161
Intro to CS I

Finish Loops/Begin C++ Strings
Odds and Ends

• Peer Reviews on design due Thursday.
• Exam I next Wednesday, 2/6/2019

WITH 109 M, T 5-6:30 NO LINC 268
```cpp
#include <iostream>
#include <string>

using namespace std;

int main() {
    int i;
    float f;
    string s;

    cout << "enter a integer: ";
    cin >> i;
    cout << "i: " << i << endl;

    cout << "enter a float: ";
    cin >> f;
    cout << "f: " << f << endl;

    cin.clear(); //move past the newline in the buffer leftover from the float
    getline(cin, s); //now read a line
    cout << "s: " << s << endl;
    cout << "length: " << s.length() << endl;
    cout << "first letter in name: " << s.at(0) << endl;

    return 0;
}
```
Solution

```cpp
#include <iostream>
#include <string>
#include <stdlib.h>

using namespace std;

int main() {
    int i, f;
    string s;
    bool error;
    do {
        error=false;
        cout << "enter an integer : " << endl;
        getline(cin, s);
        for(int i=0; i<s.size(); i++) {
            if(s.at(i) >= '0' && s.at(i) <= '9') {
                cout << "error!" << endl;
                error=true;
            }
        }
    } while(!error);
    i=atoi(s.c_str());
    cout << i << endl;
    cout << "enter a float: " << endl;
    cin >> f;
    return 0;
}
```
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
  – Run out of 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