CS 161
Intro to CS I

More Conditional Statements
and Begin Repetition
Odds and Ends...

- Last week to demo Assignment #1!!!
- Demo Assignment #2
- Assignment #3 is posted
  - Design Due on Canvas by Sunday, 10/15
Nested for Loops

for(x = 0; x < 10; x++) {
    for(y = 0; y < 10; y++) {
        cout << "hello world\n";
    }
}

- How many times is Hello World printed?

3
Reuse Variables

```cpp
int x;

for(x = 0; x < 10; x++) {
    cout << "The value of x is: " << x << endl;
}
```

```cpp
for(x = 0; x < 10; x++) {
    cout << "The value of x is: " << x << endl;
}
```
Variables with same name

```
int x;
for(x = 0; x < 10; x++) {
    for(x = 0; x < 10; x++) {
        cout << “The value of x is: ” << x << endl;
    }
}
```

• What is the output from this nested loop?
Infinite Loops

int x;
for(x = 0; x < 10; x++) {
    for(x = 0; x < 5; x++) {
        cout << "The value of x is: " << x << endl;
    }
}

0-4

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Infinite Loops

int x, y;
for(x = 0; x < 10; x++) {
    for(y = 0; y < 5; x++) {
        cout << “The value of x is: ” << x << endl;
    }
}

0 - 2 billion
-2 billion
Infinite Loops

```cpp
int x, y;
for(x = 0; x < 10; x++) {
    for(y = 0; x < 5; y++) {
        cout << "The value of x is: " << x << endl;
    }
}
```
Infinite Loops

```c
int x;
for(x = 1; x <= 10; x++) {
    cout << "The value of x is: " << --x << endl;
}
```

Better
Why is this good/bad?

```cpp
for(int x = 0; x < 10; x++) {
    for(int y = 0; y < 10; y++) {
        cout << "hello world" << endl;
    }
}
```

- Where can we access x and y?

- **no access** to x
- **local scope** y
- you don't have access to y

mitralize in loop
Looping Recap...

• **for loops**
  – Repeat for specific number of times
  – Example?

• **while loops**
  – Repeat while a condition is being met
  – Example?

• **do while loops**
  – Always do once, and repeat while condition is met
  – Example?
How do we read a string of chars?

- User-defined type in string library
  ```cpp
  #include <string>
  ```

- Declare/Create type
  ```cpp
  std::string mssg;
  ```

- Read with cin or getline
  ```cpp
  cin >> mssg;    //get a word
  getline(cin,mssg); //get a line of txt
  ```
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
        }
        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;
    } while(cin.fail()); // fail bit set if it doesn't get type expected

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

    return 0;
}
```