CS 161
Intro to CS I

Conditional Statements
Odds and Ends...

- Exercise and Assignment #2 posted
- Get Assignment #1 demoed this week
- Have lab #1 completed and checked off by beginning of lab #2
Decisions in Life

• What is a decision?
• When do we make decisions?
• How do we make decisions?
  If it is sunny today
    then I’ll go to the beach and fly a kite
  Else if it is raining today
    then I’ll stay inside and read a book
  Else if it is snowing
    then I’ll go to the mountains to ski
Decisions within Decisions

• What happens if there is no wind at the beach?

• How does this change our decisions?
  If it is sunny today
    then I’ll go to the beach
  if it is windy at the beach
    then I’ll fly a kite
  if it is not windy at the beach
    then I’ll walk on the shore
Flow chart for decisions

Is it sunny?  
- Yes → Go to beach  
- No → Is it raining?
  - Yes → Read book  
  - No → Go outside

Is it windy?  
- Yes → Fly kite  
- No → Walk on beach
Decisions in our programs

• Use an if/else
  
  if (<expression>) {
    <statement>;
    ...
    <statement>;
  }
  else {
    <statement>;
    ...
    ...
  }

What is the <expression>?

Could be a relational expression:

<expression> <relational op> <expression>

- Relational Ops
  
  == - equal to
  != - not equal to
  < - less than
  > - greater than
  <= - less than or equal to
  >= - greater than or equal to
Examples

- if(2 + 1)  //expression
- if(2 – 4)  //expression
- if(2 – 2)  //expression
- if(4 == 4)  //expression relational op expression
- if((2+1) == 4)  //expression relational op expression
- if(4.1 != 4)  //expression relational op expression
- if(3 <= 4)  //...
- if(4 >= 4)
- if(3.5 > 4)
- if(4 < 4)
- if(3+2*2 > 9)
- if((3+2)*2 > 9)
Logical Operators

• **AND:** if((1>2) && (2<5))
• **OR:** if((1>2) || (2<5))
• **NOT:** if(!(1>2) && (2<5))

• Precedence of Operators: refer to book
C++ If/Else Syntax...

```cpp
if( x > y) {
    cout << "X is greater than Y" << endl;
}
else {
    cout << "X is less than Y" << endl;
}

• When does this logic fail?
```
C++ If/Else...

if( x > y) {
    cout << "X is greater than Y" << endl;
}
else if( x < y) {
    cout << "X is less than Y" << endl;
}
else {
    cout << "X is equal to Y" << endl;
}
What are the curly braces for?

if( x > y)
    cout << “X is greater than Y” << endl;
else if( x < y)
    cout << “X is less than Y” << endl;
else
    cout << “X is equal to Y” << endl;
What if we are testing for ==?

```cpp
if( x == 0) {
    cout << "X is zero" << endl;
}
else if( x == 1) {
    cout << "X is one" << endl;
}
else if( x == 2) {
    cout << "X is two" << endl;
}
else {
    cout << "Not 0, 1, 2!!!" << endl;
}
```
How do we read a string of chars?

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

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

- Read with cin or getline
  ```cpp
  cin >> mssg; //get a word
  getline(cin,mssg); //get a line of txt
  ```
Demo...
We can use a switch...

```c
switch( <expression> ) {
    case <const-expr>:
        <statement>;
        ...
    case <const-expr>:
        <statement>;
        ...
    default:
        <statement>;
        ...
}
```
C++ Switch Example

```cpp
switch( x ) {
    case 0:
        std::cout <<“X is zero
”;
        break;
    case 1:
        std::cout <<“X is one
”;
        break;
    case 2:
        std::cout <<“X is two
”;
        break;
    default:
        std::cout <<“You have entered an invalid number!!!
”;  
}
```
C++ Switch Example

```c++
switch( x ) {
    case 0:
    case 1:
        std::cout << "X is zero or one\n";
        break;
    case 2:
        std::cout << "X is two\n";
        break;
    default:
        std::cout << "You have entered an invalid number!!!\n";
}
```