

Control structures

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Fall 2017

Conditionals

If-then-else

A *conditional* is a test: 'if something is true, then do this, otherwise maybe do something else'. The C++ syntax is

```
if ( something ) {  
    do something;  
} else {  
    do otherwise;  
}
```

- The 'else' part is optional
- You can leave out braces in case of single statement.

Complicated conditionals

Chain:

```
if ( something ) {  
    ...  
} else if ( something else ) {  
    ...  
}
```

Nest:

```
if ( something ) {  
    if ( something else ) {  
        ...  
    } else {  
        ...  
    }  
}
```

Comparison and logical operators

| Operator | meaning | example |
|----------|------------------|--|
| == | equals | <code>x==y-1</code> |
| != | not equals | <code>x*x*!=5</code> |
| > | greater | <code>y>x-1</code> |
| >= | greater or equal | <code>sqrt(y)>=7</code> |
| <,<= | less, less equal | |
| &&, | and, or | <code>x<1 && x>0</code> |
| ! | not | <code>!(x>1 && x<2)</code> |

Switch statement example

Code:

```
switch (n) {  
  case 1 :  
  case 2 :  
    cout << "very small" << endl;  
    break;  
  case 3 :  
    cout << "trinity" << endl;  
    break;  
  default :  
    cout << "large" << endl;  
}
```

Output:

```
echo "2" | ./switch  
very small
```

Local variables in conditionals

The curly brackets in a conditional allow you to define local variables:

```
if ( something ) {  
    int i;  
    .... do something with i  
}  
// the variable 'i' has gone away.
```

Exercise 1

Read in an integer. If it's a multiple of three print 'Fizz!'; if it's a multiple of five print 'Buzz'!. If it is a multiple of both three and five print 'Fizzbuzz!'. Otherwise print nothing.

Project Exercise 2

Read two numbers and print a message like

3 is a divisor of 9

if the first is an exact divisor of the second, and another message

4 is not a divisor of 9

if it is not.