

# Control structures

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# 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&gt;x-1</code>
>=	greater or equal	<code>sqrt(y)&gt;=7</code>
<,<=	less, less equal	
&&,	and, or	<code>x&lt;1 &amp;&amp; x&gt;0</code>
!	not	<code>!( x&gt;1 &amp;&amp; x&lt;2 )</code>

*Precedence* rules are common sense. When in doubt, use parentheses.

# Switch statement example

Cases are executed consecutively until you 'break':

## Code:

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

## Output from running switch in code directory basic:

```
echo "1" | ./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.