Control structures

Victor Eijkhout

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

Precendence 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:

```
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'!. It 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.