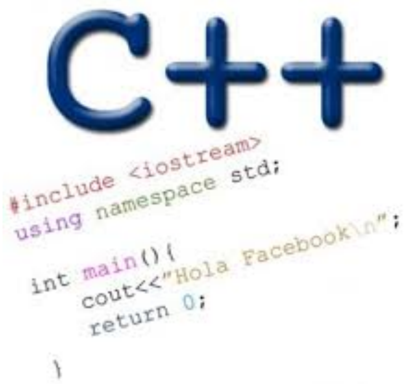
BOOLEAN EXPRESSIONS CONTROL FLOW (IF-ELSE) INPUT/OUTPUT

Problem Solving with Computers-I



```
#include <iostream>
using namespace std;

int main(){
    cout<<"Hola Facebook\n";
    return 0;
}
```

Announcements

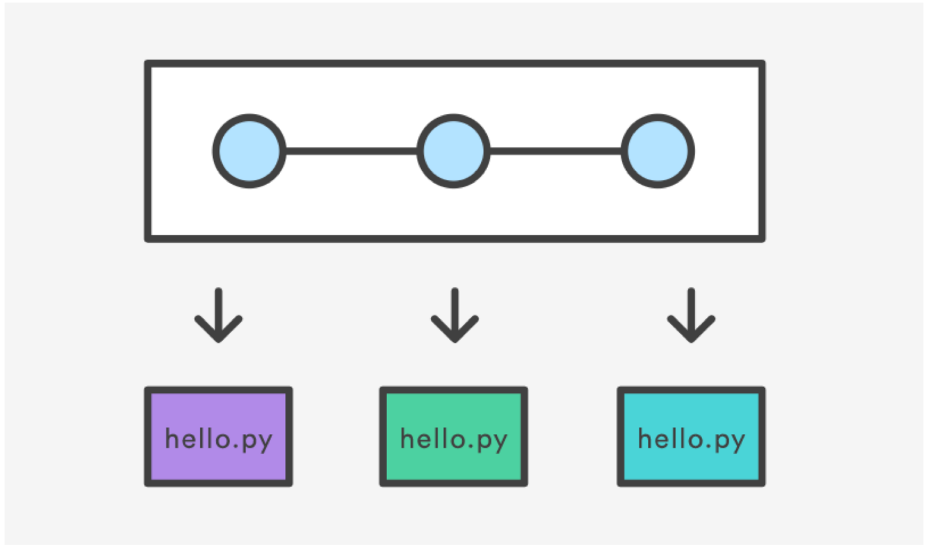
- HW02: Complete (individually)using dark pencil or pen, turn in during lab section next Wednesday
- Please use Piazza to ask questions instead of email
- If you must email me, include [CS16] in the subject line

What is git?

Git is a version control system (VCS).

A VCS allows you to keep track of changes in a file (or groups of files) over time

Git allows you to store code on different computers and keep all these different copies in sync



Git Concepts

repo (short for repository): a place where all your code and its history is stored

Remote repo: A repo that exists on the web (in our case github.com)

In class demo

- creating a repo on github.com
- adding collaborators to the repo
- adding files to the repo
- Updating files in a remote repo using a web browser
- Viewing the version history

Boolean Expressions

- An expression that evaluates to either true or false.
- You can build Boolean expressions with relational operators:

```
==   // true if two values are equivalent
!=   // true if two values are not equivalent
<    // true if left value is less than the right value
<=   // true if left value is less than OR EQUAL to the right value
>    // true if left value is greater than the right value
>=   // true if left value is greater than OR EQUAL to the right value
```

Boolean Expressions

- Integer values can be used as boolean values
- C++ will treat the number 0 as false and any non-zero number as true.

```
bool x = 5 == 1;  // x = 0
bool x = 3 != 2;  // x = 1
```

- Combine boolean expressions using Logical Operators

```
!    // inverts true to false or false to true
&&   // boolean AND
||   // boolean OR
```

- Example

```
bool x = true;
bool y = true;
x = !x;         // x = false
x = x && y      // x = false
x = x || y      // x = true
```

Control flow: if statement

- The `condition` is a **Boolean expression**
- These can use relational operators

```
if ( Boolean expression) {
   // statement 1;
   // statement 2;
}
```

- In C++ 0 evaluates to a false
- Everything else evaluates to true

Examples of if statements

- The `condition` is a **Boolean expression**
- These can use relational operators

```
if ( 1 < 2 ) {
   cout<< "foo" ;
}

if ( 2 == 3) {
   cout<<"foo" ;
}
```

Use the curly braces even if you have a single statement in your if

Fill in the ‘if’ condition to detect numbers divisible by 3

A. `x/3 == 0`
B. `!(x%3)`
C. `x%3 == 0`
D. Either B or C
E. None of the above

```
 if ( _________ )
   cout<< x << “is divisible by 3 \n” ;
 }
```

Control Flow: if-else

```
if (x > 0){
    pet = dog;
    count++;
}  else {
    pet = cat;
    count++;
}
```

- Can you write this code in a more compact way?

Control Flow: Multiway if-else

```
if (x > 100){
    pet = dog;
    count++;
}   else if (x > 90){
    pet = cat;
    count++;
}   else {
    pet = owl;
    count++;
}
```

- Can you write this code in a more compact way?

Input from user (using cin)

- Getting input from stdin (standard input)

```
int x;
cout<< “Enter a number”<<endl;
cin>>x;
```

Let’s code Fizzbuzz -1.0

```
$ Enter a number:  1
1
$ Enter a number:  2
2
$ Enter a number:  3
fizz
$ Enter a number:  4
4
```

```
$Enter a number:  5
5
$Enter a number:  6
fizz
$Enter a number:  7
7
$Enter a number:  15
fizz
```

Input from user (via the command line)

- We can pass information into a C++ program through the command line when executing the program.
- The main function will need to have the following:

  int main(int argc, char *argv[])

- `int argc` is the number of "arguments" the program has, including the executable name.
- `char* argv[]` is the "list" of arguments passed into the program.
  - argv[0]: name of the program
  - argv[1]: 1st argument, remember this is a C-string
  - Use atoi to convert a C-string to a number atoi(argv[1])

Let’s code Fizzbuzz -2.0 (taking arguments from main)

```
$ ./fizzbuzz 1
1

$ ./fizzbuzz 9
Fizz

$ ./fizzbuzz 15
Fizzbuzz
```

Next time

- Loops