TOOLS
C++ DATA TYPES

Problem Solving with Computers-I
Chapter 1 and Chapter 2

CLICKERS OUT – FREQUENCY AB

Programming in the unix environment

- File System
- Navigating the file system with unix commands
- Relative vs absolute path
- Using a unix editor: vim: https://ucsb-cs16.github.io/topics/vim_basic_eight/

Review: Program compilation

What does it mean to “compile” a C++ program?

A. Write the implementation of the program in a .cpp file
B. Convert the program into a form understandable by the processor
C. Execute the program to get an output
D. None of the above

Simple C++ program

```
// hello.cpp
#include <iostream>

using namespace std;

int main() {
   cout << "Hello CS 16!" << endl;
   return 0;
}
Compile and execute:
$ g++ -o hello hello.cpp
$ ./hello
Hello CS 16!
$
```

Review: Kinds of errors

Which of the following types of errors is produced if our program divides a number by 0?

A. Compile-time error
B. Run-time error
C. Both A and B
D. Neither A or B

Review: C++ Variables and Datatypes

- **Variables** are containers to store data
- **C++** variables must be “declared” before they are used by specifying a datatype
  - `int`: Integers
  - `double`: floating point numbers
  - `char`: characters
  - `string`: sequence of characters e.g. “apple”

Naming variables

- **Variable names must:**
  - Start with an alphabet (a-z, A-Z) or underscore(_)
  - Other characters can be alphanumeric and underscore characters
  - No spaces or other special characters.
- **C++ is case-sensitive**
  - ‘x’ and ‘X’ are considered different variables.

C++ Uninitialized Variables

- Value of uninitialized variables is “undefined”
- Undefined means “anything goes”
- Can be a source of tricky bugs

- What is the output of the code below?

```
int main() {
    int a, b;
    cout<<"The sum of "<< a << " and " << b<< " is:"<< a+b<<endl;
    return 0;
}
```

Variable Assignment

- The values of variables can be initialized...

```
int myVariable = 0;
```

-or-

```
int myVariable;
myVariable = 0;
```

- ...or changed on the fly...

```
int myVariable = 0;
myVariable = 5 + 2;
```

Variable Assignment

- ...or even be used to update the same variable!

```
int myVariable = 0;
myVariable = 5 + 2;
myVariable = 10 - myVariable;
myVariable = myVariable==0;
```

C++ types in expressions

```
int i =10;
double sum = 1/i;
```

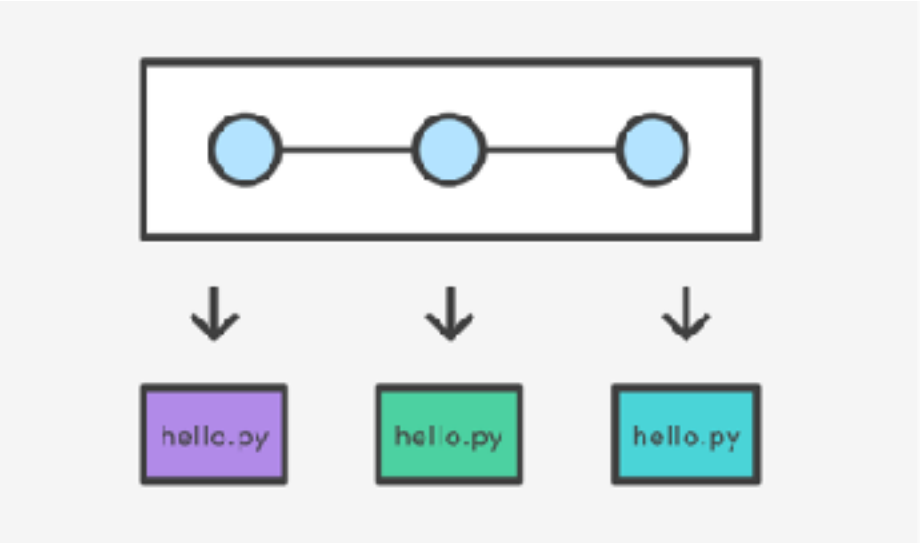
What is printed by the above code?

A. 0
B. 0.1
C. 1
D. None of the above

What is git?

Git is a version control system (VCS).

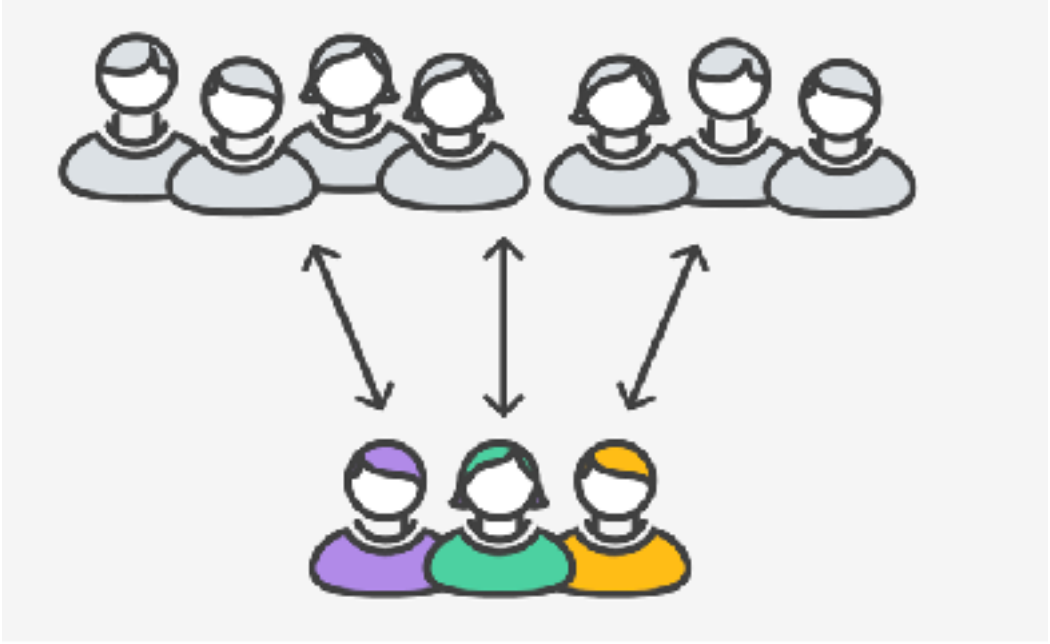
A VCS allows you to keep track of changes in a file (or groups of files) over time



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

Why are we learning git in this class?

- Collaborate
- Share code ownership
- Work on larger projects
- Provide feedback on work in progress
- Learn professional software development tools



Git Concepts

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

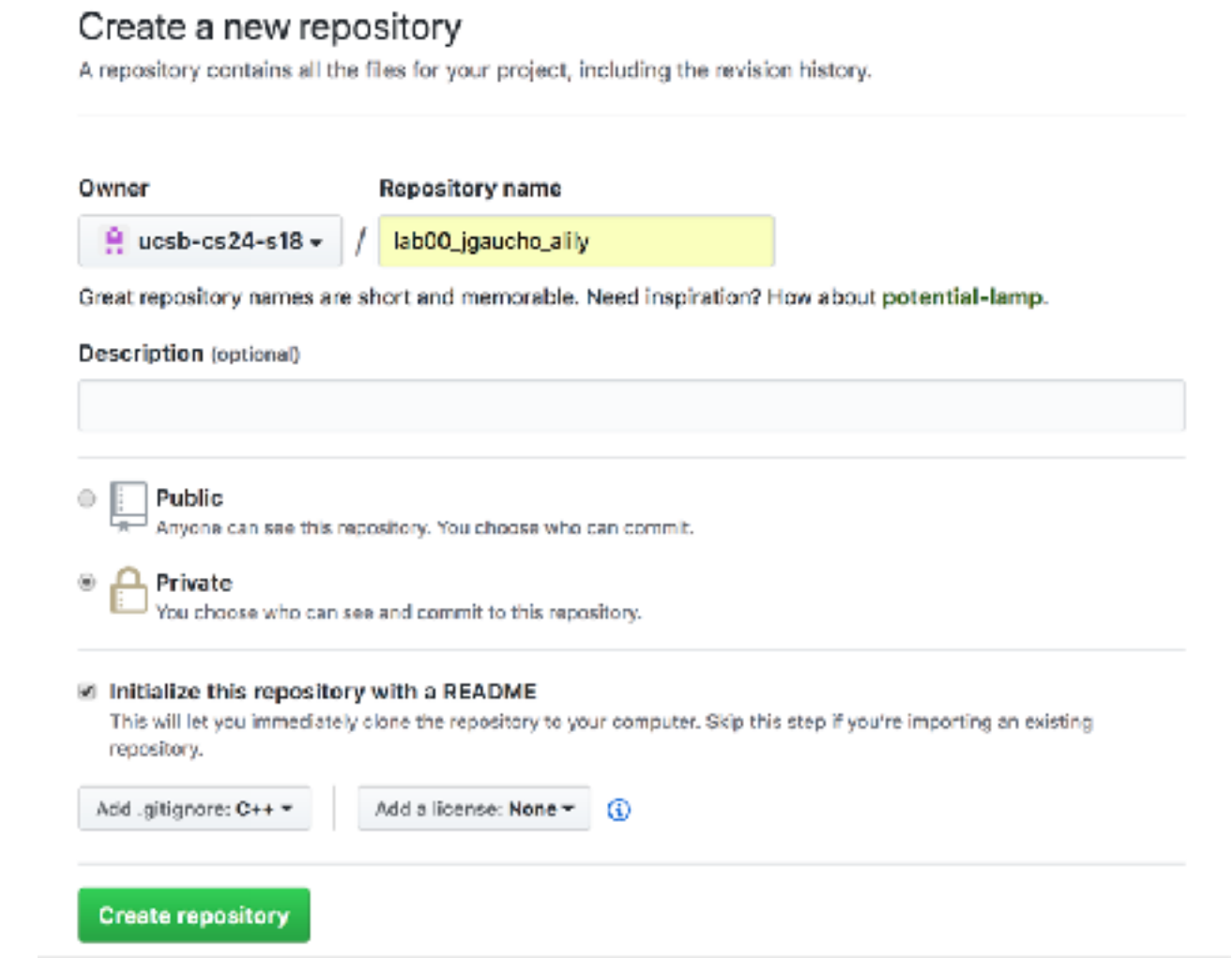
Remote repo: A repo that exists on the web (in our case github.com)

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

Creating a repo on the cloud (www.github.com)

Navigate to www.github.com and create a repo on the internet



Remote repo

Next time

- Control Flow