

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
- File versus directory
- Path: Relative vs absolute
- Navigating the file system with unix commands:
 - ls (list)
 - mv (move)
 - cp (copy)
 - pwd (print working directory - show me the full path)
 - mkdir (make directory)
 - cd (change directory)
- Using .(dot) and ~ when specifying relative paths

Writing a simple C++ program

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

using namespace std;

int main() {
    cout << "Hello CS 16!" << endl;
    return 0;
}
```

Compiling and executing a C++ program

```
$ g++ -o hello hello.cpp  
$ ./hello  
Hello CS 16!  
$
```

Vim survival skills

- Learn the basic 8: https://ucsb-cs16.github.io/topics/vim_basic_eight/
- Open a new file: `vim <filename>`
 1. Quit without saving
 2. Enter code
 3. Save, Save and quit
 4. Copy paste, cut and paste
 5. Search, Search and replace
 6. Show line numbers
 7. Go to a line number
 8. Save as

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

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

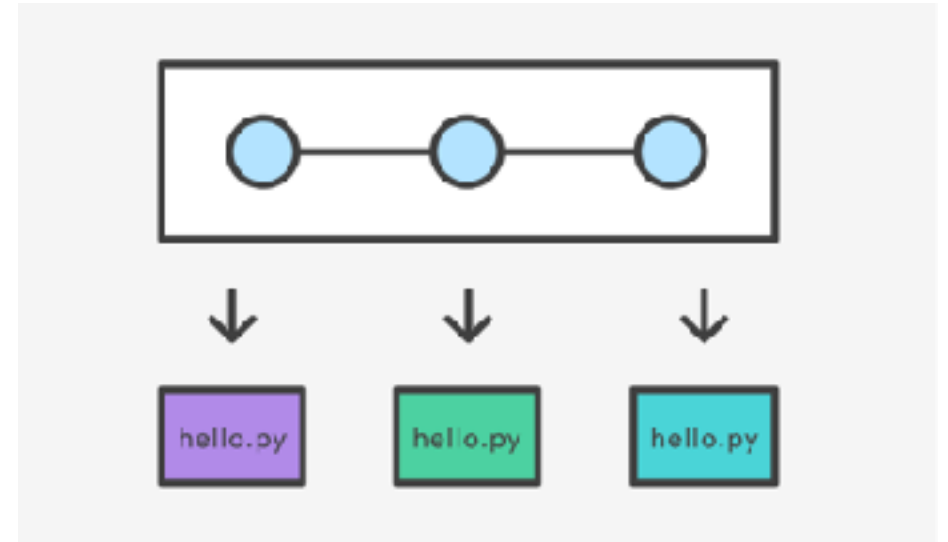
D. None of the above

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



Git Concepts

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

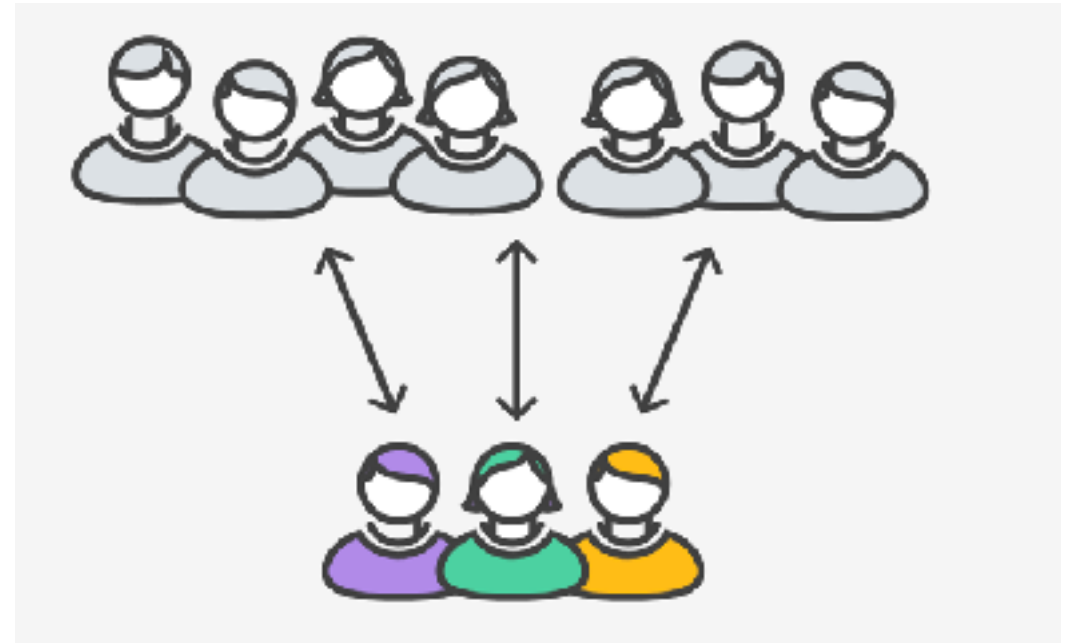
Remote repo: A repo that exists on the web (in our case github.com)

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**

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



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

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

Create a new repository

A repository contains all the files for your project, including the revision history.

Owner

ucsb-cs24-s18 ▼

Repository name

lab00_jgaucho_alily

Great repository names are short and memorable. Need inspiration? How about **potential-lamp**.

Description (optional)

☒



Public

Anyone can see this repository. You choose who can commit.

☐



Private

You choose who can see and commit to this repository.

☒

Initialize this repository with a README

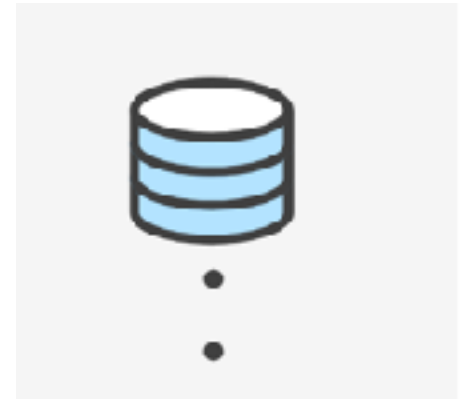
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: C++ ▼

Add a license: None ▼



Create repository



Remote repo

Next time

- Control Flow