

LEC 16

CSE 122

Third Party Libraries

BEFORE WE START

Talk to your neighbors:

What has been your favorite assignment so far this quarter?
Could be for CSE 122 or other class!

Music: [Hunter/Miya's Playlist](#)

Instructor Hunter Schafer / Miya Natsuhara

TAs

Ajay	Gaurav	Melissa
Andrew	Hilal	Noa
Anson	Hitesh	Parker
Anthony	Jake	Poojitha
Audrey	Jin	Samuel
Chloe	Joe	Sara
Colton	Joe	Simon
Connor	Karen	Sravani
Elizabeth	Kyler	Tan
Evelyn	Leon	Vivek


Questions during Class?

Raise hand or send here

sli.do #cse122



Lecture Outline

- **Announcements** 
 - Quiz 3 Logistics
 - Final Exam Logistics
- Third Party Libraries
- Open-Source Software
- Intro Creative Project 3

Quiz 3 Logistics

Reminder: Quiz 3 is Tuesday 12/6 and there will be no retake opportunity. Modifying Quiz 3 logistics to account for that.

Quiz 3 Logistics

- Take-Home Quiz: Available 8:30 am – 11:59 pm on Tuesday 12/6
- No enforced time limit, but will be similar length to other quizzes
- Will take your last submission before due date
- Will provide feedback on your solution's correctness each submission
- Collaboration is allowed *with caution*
 - Don't copy other's work
 - You'll need to be able to do the Quiz 3 content on your own on the Final Exam


Final Exam Logistics

Final Exam Logistics posted on [the course website](#). **You should read the whole thing**, but we'll talk about highlights today.

Important points:

- Tuesday 12/13 from 12:30 – 2:20 pm
- There will be assigned seats (posted soon)
- Don't cheat
 - Do not start early or work after time is called
 - No electronic devices or communicating with others during the test
- You will be able to bring in *one* reference sheet of your own notes
 - Additionally, we will provide a reference sheet during exam (posted on website soon)
- Topic list
- See website for details about policies w.r.t. what we expect of your answers


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Library

- The term **library** or **third party library** is used broadly to refer to a collection of code someone has written, packaged up, and shared for others to use
 - Example: JUnit is a library!
- There are a *lot* of libraries out there!
 - [Here](#) is just one person's list of favorites with only 687 different libraries 😅
- Example: [JFugue](#) a Java library for making music

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Open-Source Software

- Libraries are just code that people write! You can make your own if you want! Or contribute to one that wants help!
- **Open-Source Code** are projects where all the code is visible to the world.
- Many Open-Source projects are also run by teams of individuals all working on the same code base. Need collaboration tools to make it easy for many people to work on one piece of code.
- Collaboration Tools
 - `git` to manage the process of collaborating on code
 - Websites such as [GitHub](#) or [GitLab](#) to host and share the code
 - Do **not** post solutions to your assignments publicly on these (or other) sites
- Won't focus on collaboration tools in the intro sequence
 - CSE Majors: CSE 391 Other Majors: CSE 374

Public != Free to Use

- Just because some code is publicly available to look at, doesn't mean you have permission to download, run, copy, or edit that code.
- All code should have a **License** or **Software License**, a legal set of permissions given by the code authors to users of the code
 - You need to make sure you are abiding by any licenses in code repositories you are interested in using (they are legally binding)
 - If you make public repositories and you want people to use it, you need to include some license.
 - The default license means nobody can use/copy/modify your code (and this gets very messy when you have other people working on the project)
 - [How to choose a license](#) (a common default is the [MIT License](#))

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Design Patterns

- There are often common patterns / principles for the good design of code to make it
 - Easier to understand
 - Easier to write new features
 - Easier to test and spot bugs
- One of the most universal patterns is **abstraction** or **separation of concerns**
 - Non-programming Example: Running a restaurant would be much harder if every employee had to constantly switch being wait staff, chefs, bartenders, cleaners. Separating roles makes the whole job easier and efficient.
 - Programming Example: We've talked about the importance helper methods add to readability
- Optional Further Reading: [Model-View-Control Design Pattern](#)

Separation of Concerns

- Most applications separate the following things:
 - How the user views and interacts with an application
 - The “core logic” behind how the application works
- Example: Snapchat just released a browser app
 - Very unlikely they wrote the entire code base from scratch.
 - Instead, probably already had separated:
 1. The “core logic” of sending/receiving pictures, marking them as viewed, etc.
 2. A view on that controller that displays buttons, pictures, on an iPhone for the user to interact with
 - Now, adding a browser app doesn't require any changes to the first system, just making a new version of the view to work on browsers instead of iPhones (and they probably have a different version for Android)
- Common theme: Separate the “logic” of an app from how the user interacts with it

Separation of Concerns in CSE 122

- With the introduction of Objects and Object-Oriented Programming, we can do this much more easily
 - If you wanted to make a visual app for Program Linting, you don't have to change most of the files! Just make a new `LinterMain`
- However, most of our previous assignments do this quite poorly
 - Example: For TODO List, you had code that interacted with the user mixed up with the logic for managing the TODO list! Concerns not separated!
- So Creative Project 3 is you deciding how to fix that!



Creative Project 3 – OOP It!

- Take one of our earlier assignments and rewrite it to use Object Oriented Programming to better separate the concerns of interaction and managing the state of the application
- You pick *one* of the assignments
 - TODO List
 - Music Playlist
 - Absurdle
- You get to choose which assignment you want to make OOP'ed, and how to design that object!
 - Externally it should have the same behavior as original assignment