

Final Lab

You may work with a partner.

Objective: To explore your interests in computer science and expand your knowledge of Java.

Background: We've come a long way in this course, haven't we? In September, you were exploring the basics of primitive types, methods, and objects. But even now, as we prepare for the AP exam, we've only scratched the surface.

Computer science is a vast field with tons of applications, and that list is only growing. Now that you know the basics, it's time to explore it.

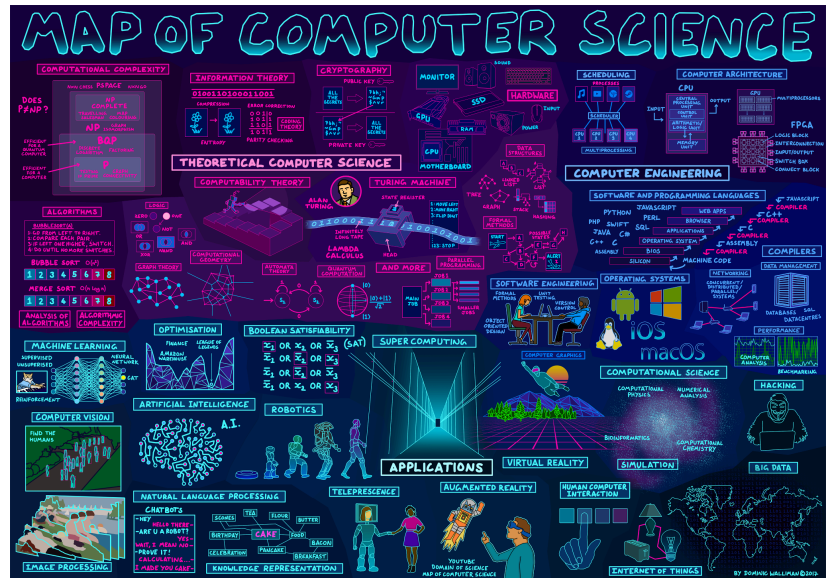


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Overview

In this project, you are going to do a lot of independent research before you create something on your own. You will self-teach, reflect, and teach others about what you've learned.

Here are a few topics you could explore to get you started:

- Java graphics (JavaFX or Swing)
- Java apps (using Android Studio)
- Other programming languages (JavaScript, C++, Go, Swift, etc.)
- Web development (Front-end, back-end, full stack)
- Data science
- AI/Machine learning
- The history of programming languages
- Game design and development (Unity and other engines)
- Operating systems (such as Linux)

A popular idea is to make a “simple” game like Pong or Wordle in a programming language of your choice. Of course, “simple” doesn’t mean “easy.” You will quickly realize that even the most basic games out there can be more difficult to program than you think.

You may also choose to follow a developed curriculum in order to create a final product. Here are a few examples:

- [University of Helsinki MOOC Center](#) (Java, Python, AI, etc.)
- FreeCodeCamp
- The Odin Project (TOP)
- Full Stack Open
- Datacamp (6 free courses including Data Science, Machine Learning, and SQL)
- JetBrains Academy (for their free Kotlin Basics course)

Grading

This lab is separated into four smaller tasks.

- **The planning stage** (15 pt. major summative): Tell me what you want to create, and be as specific as necessary. This is basically a “sales pitch” on why you think your idea is worthy of a final project. Don’t make it so easy that you can code it in a few days.
- **Two progress checks** (10 pt. minor summative each): This is where you show me what you’ve done so far; make sure you have something to show for these. You’ll get a great grade as long as you have been productive both in and out of class.
- **The final submission** (25 pt. major summative): The final draft of your project. If your task is challenging enough, you probably won’t fully complete your project...and that’s perfectly fine. Projects can be an ongoing process; you might want to keep working on this in the future. Keep in mind that this step includes submitting all working code.
- **The reflection** (25 pt. major summative): Elaborate on the journey you’ve taken for this project. What went well? What did you learn? You can submit this in any medium you like (such as an essay or video) as long as Mr. Mays approves of it beforehand.

Deadlines vary depending on your grade level and whether you’re taking a capstone course. They are subject to change.

Activity	Deadline for Capstone Seniors	Deadline for Non-Capstone Seniors	Deadline for Non-Seniors
Planning stage	April 19 (A) / 22 (B)	April 25 (A) / 26 (B)	April 29 (A) / 30 (B)
Check-in 1	April 29 (A) / 30 (B)	May 3 (A) / 6 (B)	May 9 (A) / 10 (B)
Check-in 2	May 6 (A) / 7 (B)	May 15 (A) / 16 (B)	May 21 (A) / 22 (B)
Final submission	May 13 (A) / 14 (B)	May 23 (A) / 24 (B)	May 28 (A) / 29 (B)
Reflection	May 13 (A) / 14 (B)	May 23 (A) / 24 (B)	May 28 (A) / 29 (B)

Notes

- If you have a personal device to complete this lab, I advise that you use it. You can still use Eclipse or Replit to create your code, just be aware that your code won't be as customizable and running/compiling your code will not be as fast.
- I may have a degree in computer science, but that doesn't mean I know everything. If you've ever heard of "rubber duck debugging" (explaining your code to a rubber duck), treat Mr. Mays like the duck, except he can ask clarifying questions about your code.
- You might want to learn about version control and tools like GitHub or Replit.