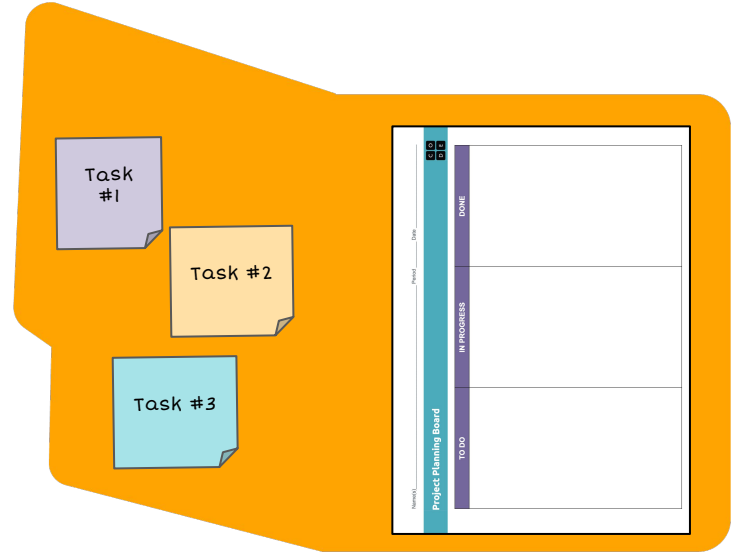# Unit 7 - Lesson 8
Project Development

Computer Science A

🎯 Benchmark #2: Due Lesson 8

- Develop one or more classes and data structures

- Implement one or more algorithms to create a visual or animation

- Obtain and implement feedback from peers

✅ **Do This:**

Update your **Project Planning Board** and **Project Backlog** with any tasks you completed, changed, or added.

🎉 Creative Coding with The Theater Project

Navigate to Lesson 8, Level 1

✅ Do This:

Begin development on your Creative Coding with The Theater Project.

Commit Your Code!

Commit Code

Backpack

Commit your code and add a comment about what the work you completed.

Save your classes to the **Backpack**.

It's time to . . .

MY CODE!

T **Tell** them something you like about their code.

A **Ask** them something about the code.

G **Give** a suggestion for improvement.

Unit 7 - Lesson 9
System Reliability

Computer Science A

Retrieve
your knowledge and ideas and write it down silently

Pair
up with a neighbor and talk about your reflections

Share
your thoughts in a class discussion

💡 **Discuss:**

When have you experienced a **bug** 🪲 in an application or program that you use that affected **system reliability** - a system's ability to **function without failure**?

📝 **Unit 7 Guide**

🚀 **Question of the Day**

What issues and impacts result from software bugs, and what are strategies to maximize system reliability?

System reliability refers to a system's ability to function without failure.

📝 **Unit 7 Guide**

Open Source Bugs

📍 **You and your partner should have:**

- two copies of the same Open Source Bugs activity guide

- pen / pencil

Activity guide excerpt:

Name(s) _____ Period _____ Date _____

Activity Guide - Open Source Bugs (Version A)

Read the following excerpt from the Vox article "The Heartbleed Bug, explained." Then, with a partner, answer the questions below.

Excerpt

In 2014, security researchers discovered a serious flaw in SSL, the encryption technology that secures the web.

What was the Heartbleed Bug?
The Heartbleed bug was a serious flaw in OpenSSL, encryption software that powers a lot of secure communications on the web. It was announced by computer security researchers on April 7, 2014.

Here's how it worked: the SSL standard includes a heartbeat option, which allows a computer at one end of an SSL connection to send a short message to verify that the other computer is still online and get a response back. Researchers found that it's possible to send a cleverly formed, malicious heartbeat message that tricks the computer at the other end into divulging secret information. Specifically, a vulnerable computer can be tricked into transmitting the contents of the server's memory, known as RAM.

Which websites were affected?
Affected companies included Tumblr, Google, Yahoo, Intuit (makers of TurboTax), Dropbox, Netflix, and Facebook. All of these companies have since fixed the problem. Amazon.com was not affected, but Amazon Web Services, which is used by a huge number of smaller websites, was. Apple, Microsoft, PayPal, LinkedIn, eBay, Twitter, and AOL said they weren't affected.

Most banking and investment sites, including Bank of America, Chase, E-Trade, Fidelity, PNC, Schwab, US Bank, and Wells Fargo, were not affected. This might be because these companies used encryption software other than OpenSSL, or it might be because they hadn't upgraded to the latest version. Ironically, companies who were running a version of OpenSSL more than two years old in April 2014 were not affected by the Heartbleed bug.

What's OpenSSL?
OpenSSL is software that allows computers to communicate using the SSL encryption standards. It's an open source project created and maintained by volunteers. First released in 1998, it has become one of the most popular SSL implementations in the world.

OpenSSL is widely used. One reason for this is that it has been incorporated into various other software products. For example, two of the most popular web servers software packages, known as Apache and nginx, both use OpenSSL to encrypt websites.

At the time of the Heartbleed attack, the OpenSSL website listed just 15 active developers, most of whom contributed to the project on a volunteer basis. But not all changes to the OpenSSL software are written by

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Open Source Bugs 🪲

✅ Do This:

- Individually read the article in your activity guide.

- With your partner, answer the questions after the article.

💡 Discuss:

▶ What was the bug?

▶ How widespread was it?

▶ What is being done to maximize system reliability in the future?

🎥 The Rise of Open Source Software

How does open source software impact our roles as software engineers?

Complete the guided notes on the 📝 **Unit 7 Guide**.

HOLD that THOUGHT

💡 **Discuss:**

What can you do as **software engineers** to **maximize** the **reliability** of **open source software**?

📝 **Unit 7 Guide**

Unit 7 Study Guide

The **Unit 7 Study Guide** covers objectives, programming concepts, and syntax to help you prepare to . . .

Show What You Know!

CSA Unit 7 Study Guide

Unit 7: Method Decomposition and Recursion

This unit allows you to practice software design and development using the skills you have learned throughout the curriculum while planning and developing a creative coding project to convey a personal interest or story using The Theater. You use decomposition strategies and object-oriented principles to plan and implement ideas while ensuring their projects meet specified requirements. In the process, you learn to write `private`, overloaded, and overridden methods and use the `super` keyword in a subclass method to call a superclass method while exploring the functionality of methods and their parameters. You also learn how to trace recursive methods and identify similarities and differences between iterative and recursive solutions. You also consider ethical issues and intellectual property concerns related to AI-generated images and the need for maximizing system reliability as you explore bugs and issues in existing programs.

Objectives

In this unit, you learned:

- Differentiate between passing primitive values and object references as parameters
- Write and call overloaded, `private`, and overridden methods
- Explain the legal issues and intellectual property concerns of programs that create AI-generated images
- Trace a recursive method to determine its result
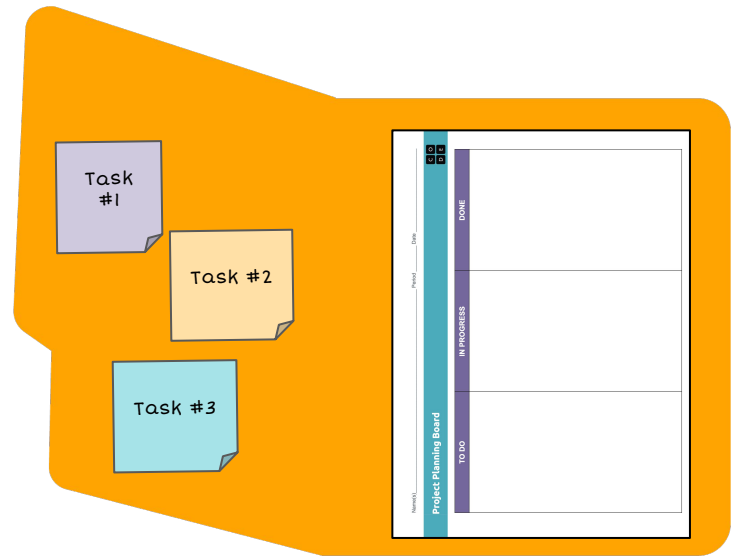- Identify strategies to maximize system reliability

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Creative Coding Project

During the project workdays, your goal is to complete the **third benchmark** of your project.

✅ **Do This:**

Update your **Project Planning Board** and **Project Backlog** with any tasks you completed, changed, or added.

💼 Key Vocabulary

- **system reliability:** a system's ability to function without failure