## Slowness

**1h 16m** of videos left **30 min** of readings left **1** graded assessment left

In this module, you'll learn about what factors can cause a machine or program to act slowly. You'll dive into ways of addressing slowness by identifying the bottleneck that might be causing the slowness. You'll learn about tools to identify which resources are being exhausted, including iotop, iftop, and activity monitor in MacOS. Next, you'll learn how computers use resources, and understand the differences between CPU, RAM, and Cache in order to help you find the possible causes for slowness in our machines or scripts. Next up, you'll learn how to write efficient code, then explore profilers to help you identify where your code is spending most of its time. Next, you'll dive into data structures and understand which ones are right for you to use. These include lists, tuples, dictionaries, sets, and expensive loops. Then, you'll dive into complex slowness problems and how utilizing concurrency and adding a caching service can improve the execution of your code. Finally, you'll understand how using threads can make the execution of your code much quicker.

### Learning Objectives

- Understand what slowness is and utilize tools to identify the bottleneck causing the issue
- Utilize tools like iotop and iftop to identify exhausted resources
- Understand the different computer components and how they can contribute to slowness
- Understand how to write efficient code, and utilize the use of data structures and loops to help your code run efficiently
- Utilize concurrency, caching services, and threads to improve the execution of your code

Hide Learning Objectives

## Understanding Slowness

Intro to Module 2: Slowness
Video • 2 min

Discussion Prompt