# Introduction to Computer Security (Part II)

Professor Travis Peters
CSCI 476 Computer Security
Spring 2020

# Today

## Announcements

- We need a note taker for the class! ➡ ***Contact ODS if interested***
- Lab 00 ➡ ***It's up!***
- Bring your laptops (especially on Thursdays—in general, these will be more hands-on days!)

## Goals & Learning Objectives

- Review some basics
  - Models/layout of a computer & a program
  - Basic C programming
  - Basic command line usage
  - Linux & Basic Linux Security

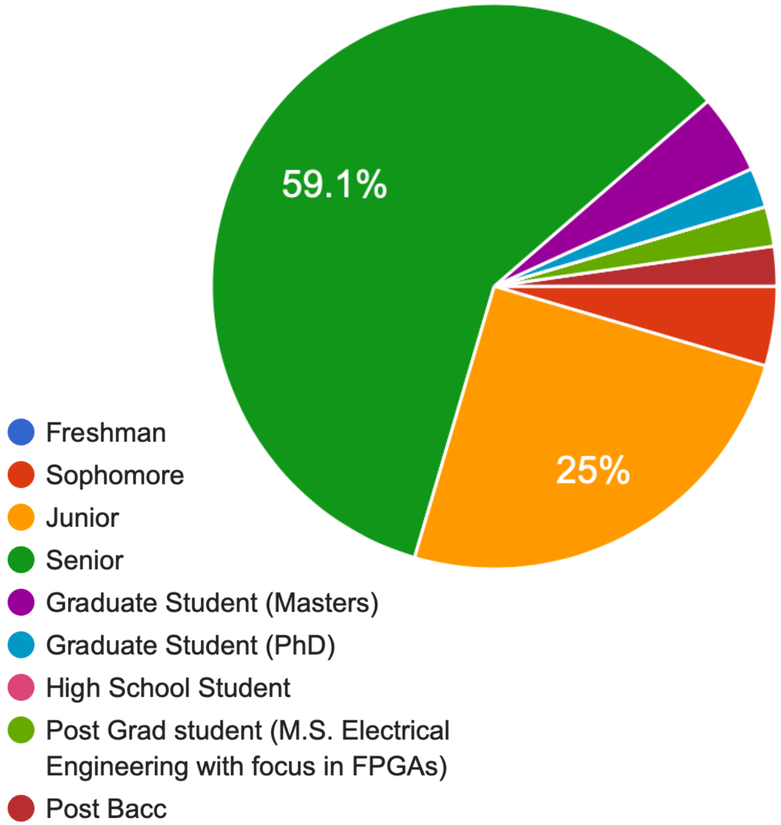
# BUT FIRST, Some Insights From the Questionnaire!

*The results are in! (mostly…)*

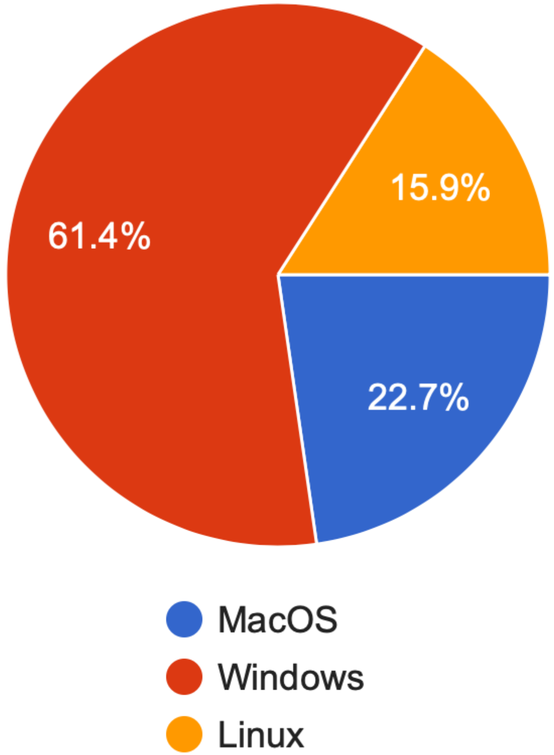
# First, Some Insights From the Questionnaire!

*Some insights into who we are, our coursework backgrounds, and what types of OS/machines we use*

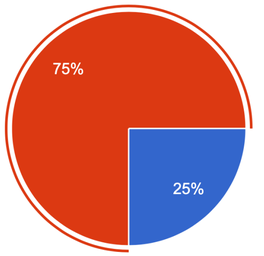
## Who do we have in the class?



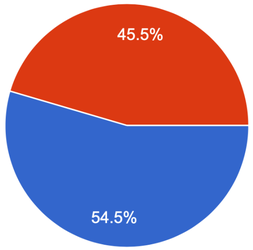

## What OS/machine are people using?



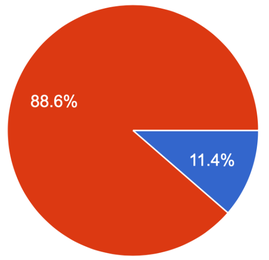

## Have you taken OS?




## Have you taken Networks?

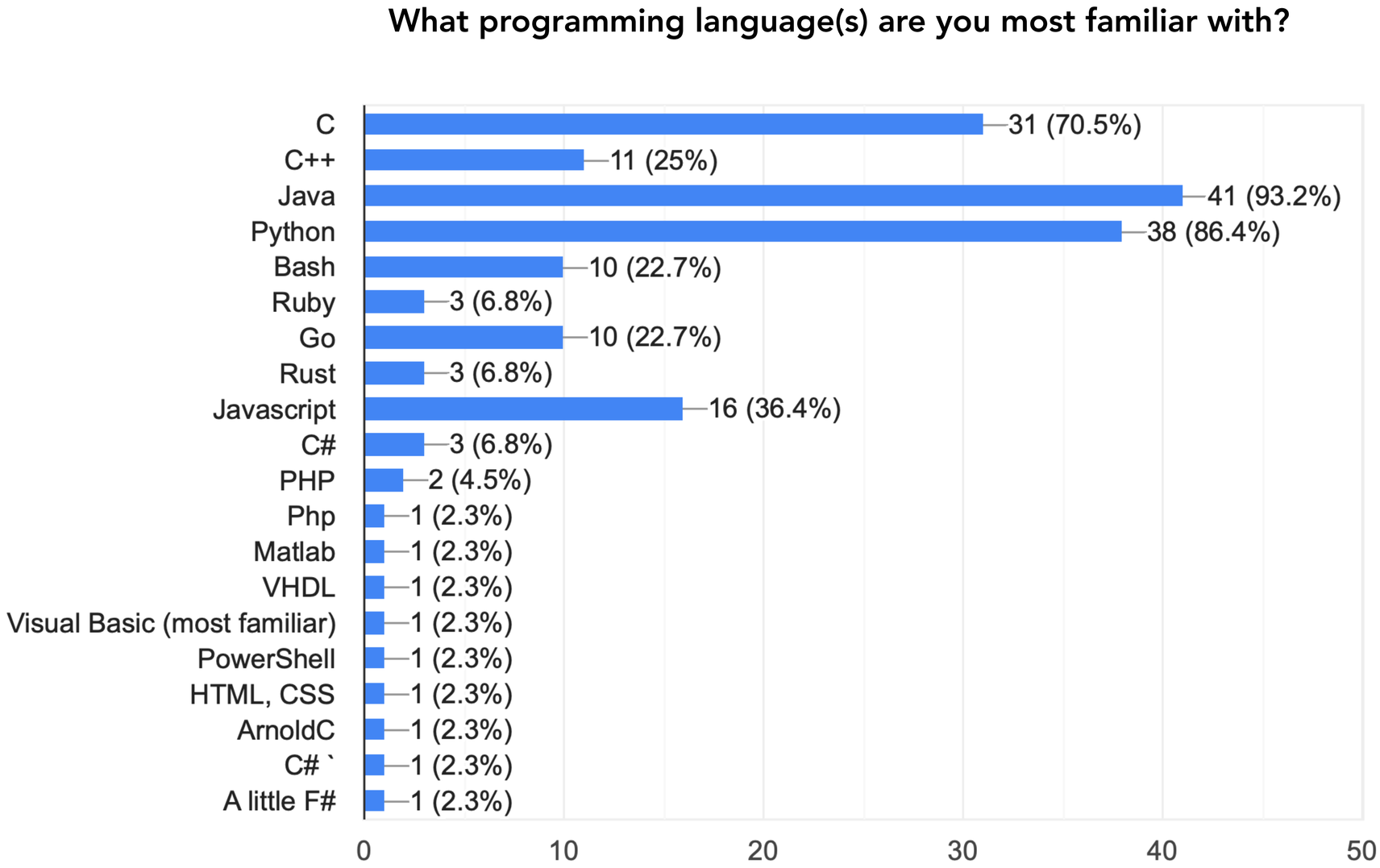



## Have you taken Security?




# First, Some Insights From the Questionnaire!

*Some insights into what programming languages we use*



# First, Some Insights From the Questionnaire!

*Some comments from the class*

So I can understand what threats actually exist in the real world to reduce the exposure of the attacks within the systems I build.

I want to do Infosec as a career

I'd like to explore options for a career involving computer security but I don't yet have a security background.

I want to learn how to protect information.

**Why are you taking CSCI 476?**
**What do you really hope to learn?**

it's a 400 level class

need the credit, sounded really interesting

***Some people also said nice things about me…***

**People also seemed to be interested in…**

Web Security (e.g., JWT), Crypto, Internet Security, VPNs, Cybercrime, ML in Security, DNS Vulns, CPU Vulns, Best Practices, …
***How to be the best hacker ever***
***How to break all the things***

***…we won't cover all of these topics, but it should be a good starting point for you!***

# First, Some Insights From the Questionnaire!

*Some comments from the class (cont.)*

I generally like the option to work alone on projects and assignments.

I work full-time/ on the weekends/ part-time as an intern

I really like to read textbooks. I prefer an introduction to the topic in class so that I can further read about it in my own time. I wouldn't mind occasional lab periods, but I prefer going to your office hours for specific questions.

I love programming projects that let me apply what I'm learning.

## Anything else I should know about you?

Who's honestly good on exams?

I hate and love computers.

I would love to do research in this area, if you have any ideas or advice please let me know!

C > Python, Linux > Windows, Ford > Chevy

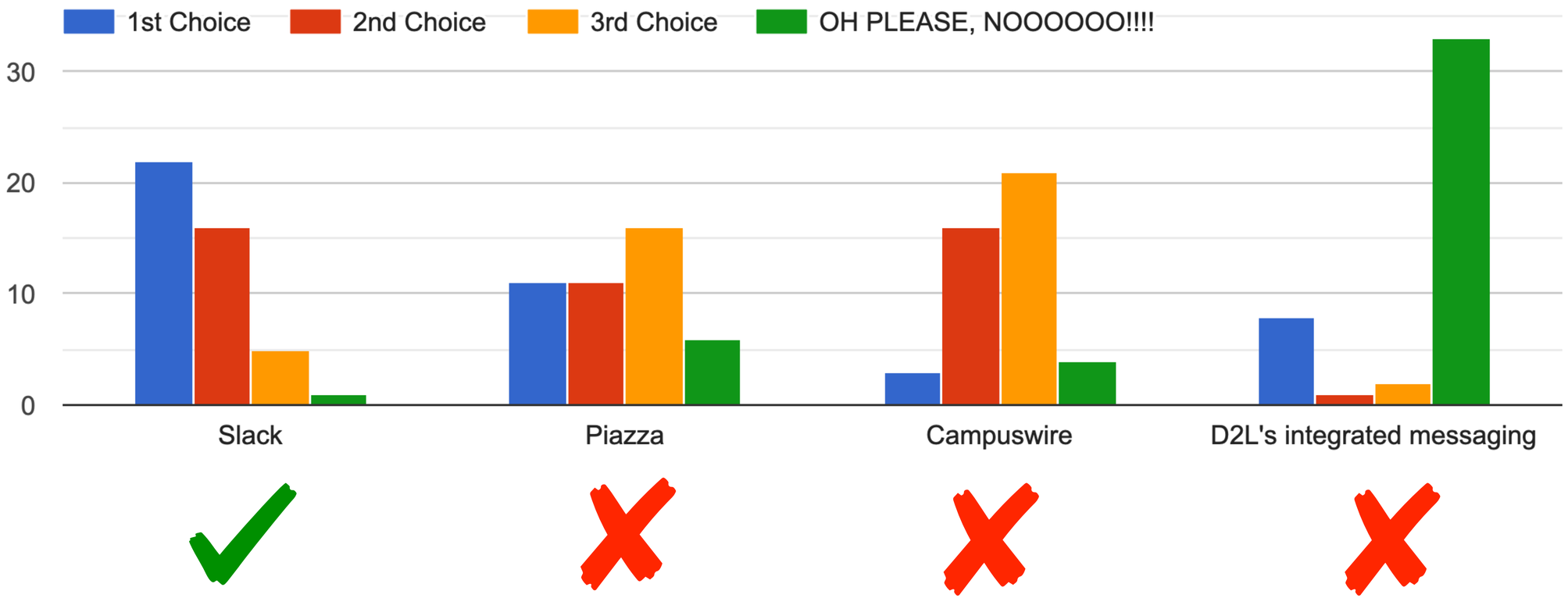
Office hours definitely scare me because I never feel like I know what to ask

This class intimidates the heck out of me. Answering your questions about OS and networks is concerning me even more because I don't know really anything about either of those.

# First, Some Insights From the Questionnaire!

*Some insights into our communication preferences*

**If we were to use ONE TOOL for COURSE COMMUNICATIONS, what is your preference?**



# First, Some Insights From the Questionnaire!

*Some insights into our communication preferences*

*Some in class exploration — let's take a quick peek at **Slack***


— https://media.tenor.co

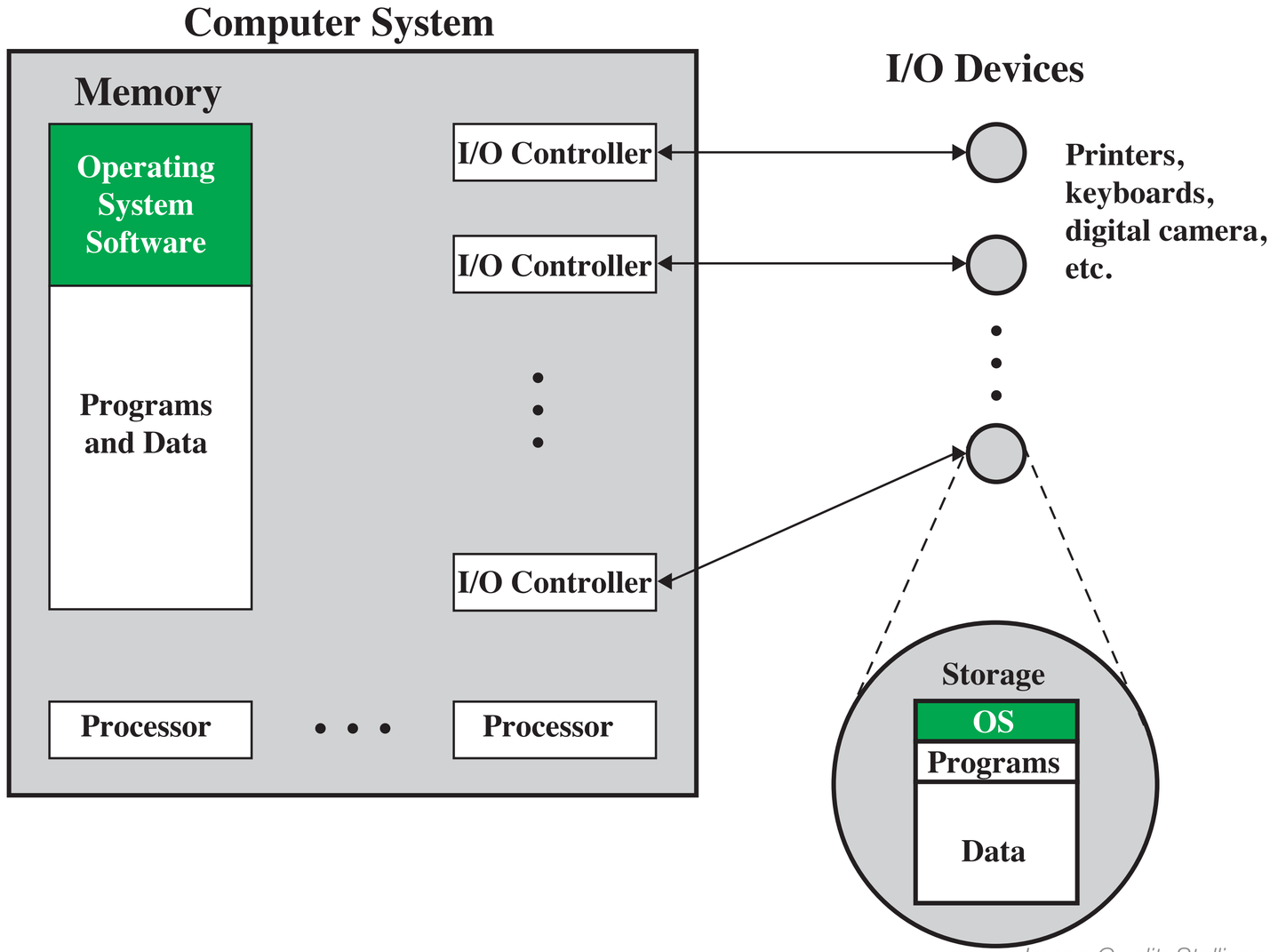
# Some Review

*Many of the following concepts are specific to the UNIX family (specially Linux), which is most relevant for this course.*

*A lot of the ideas, however, are universally relevant.*

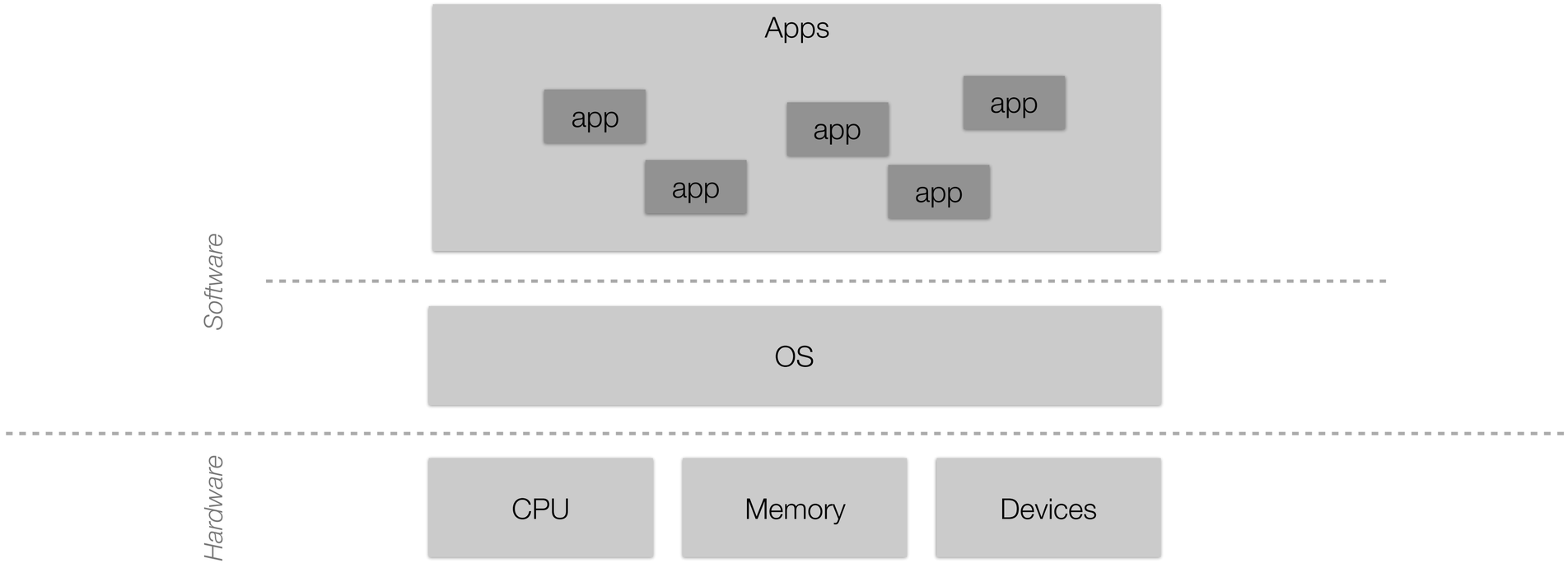
# Background: A Computer in a Nutshell

*A computer, is a computer, is a computer, …*

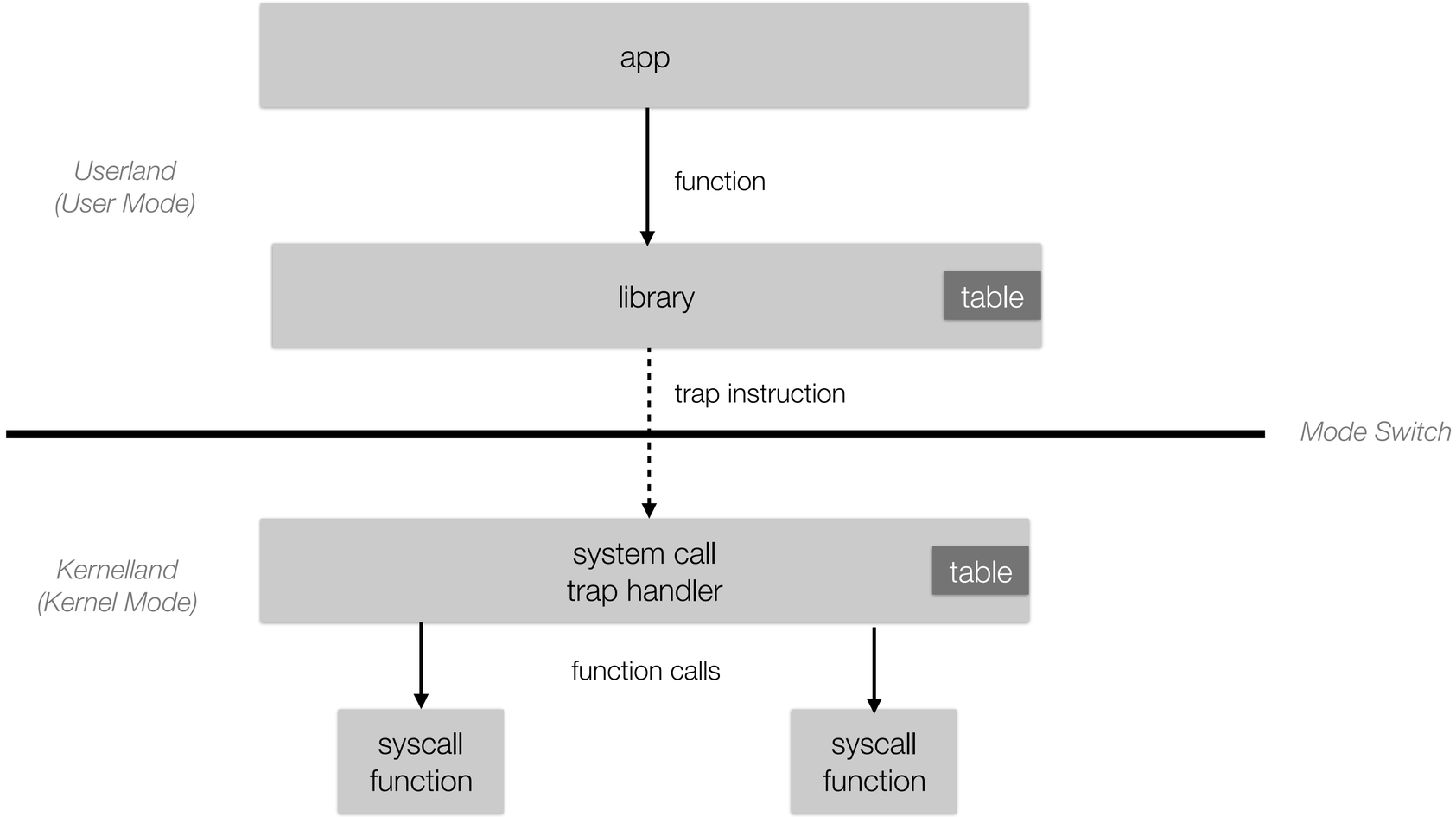



—*Image Credit: Stallings*

# Background: Typical Layers of a Computer



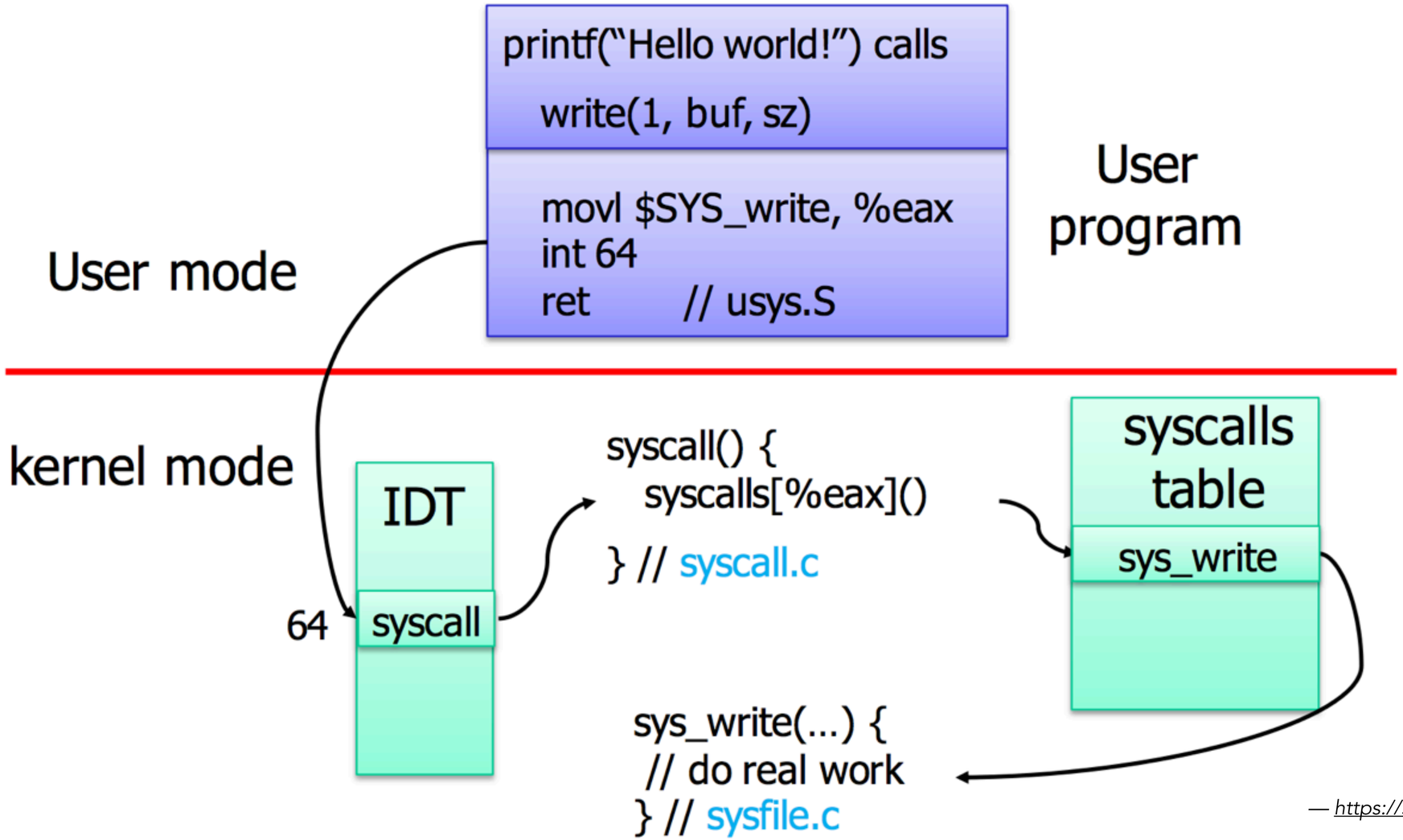
# Background: How Apps Use System Resources




Inspired by Figure 4.4 from The Craft of System Security - 1st Edition. Sean Smith (2007).

# Background: How Apps Use System Resources

*An example*




— *https://stackoverflow.com/a/29658740*

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- How does a program (file) get loaded?

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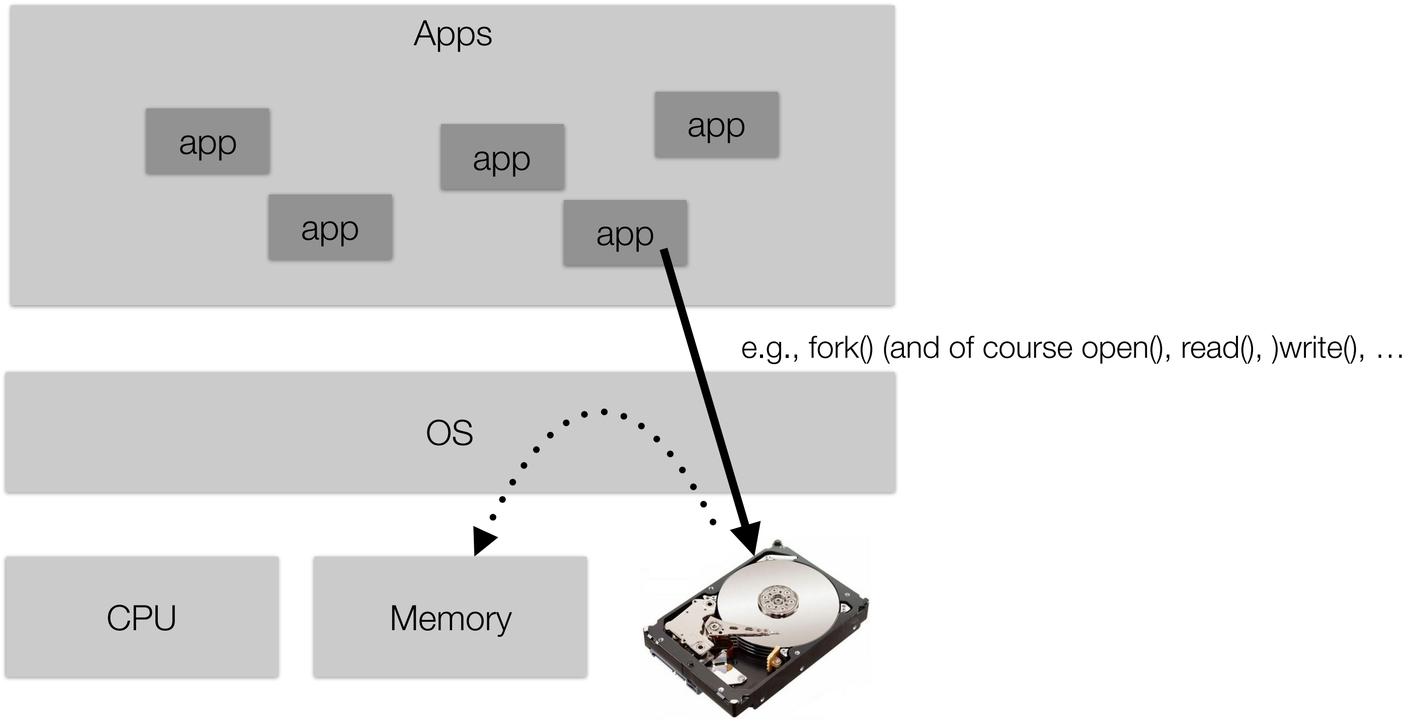

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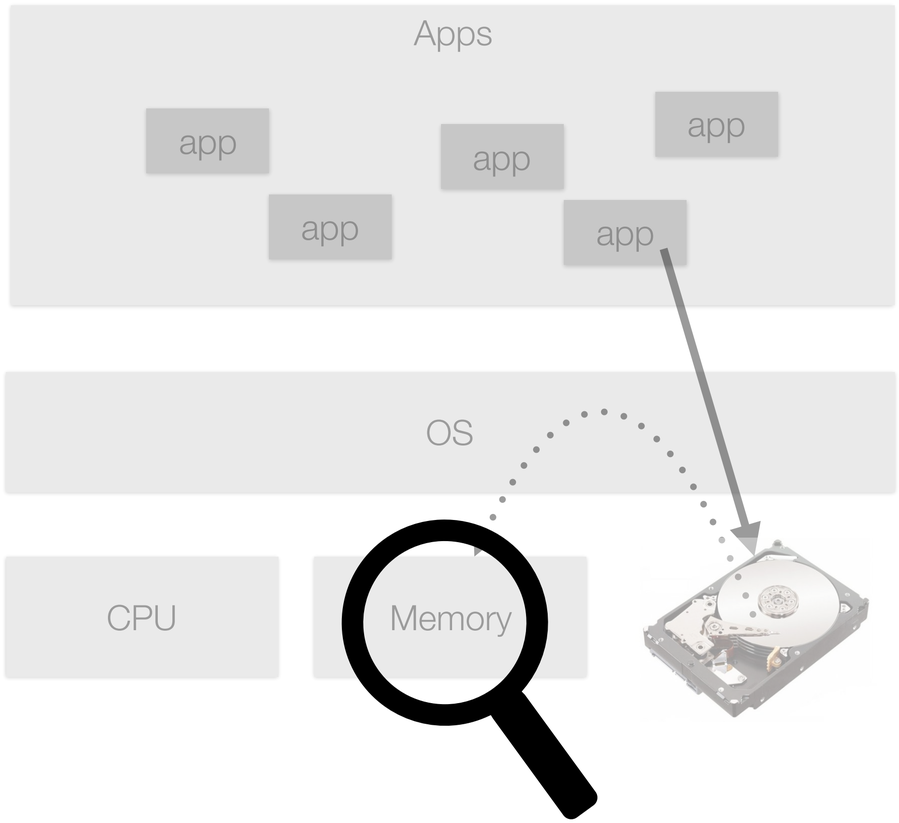
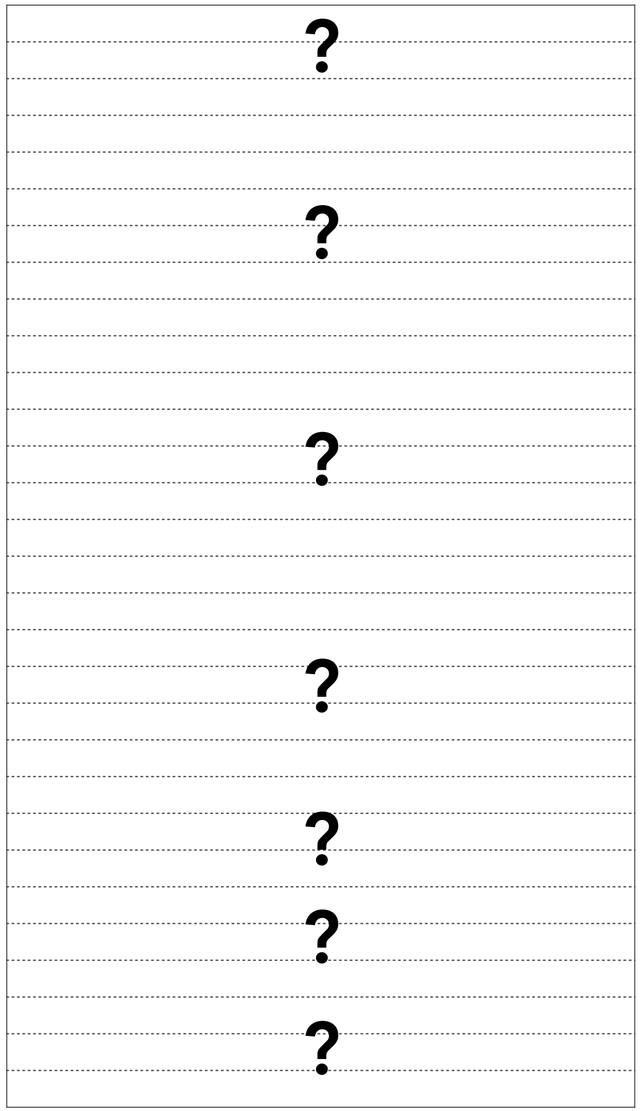
- When a ***program*** is loaded into memory, what does it look like?



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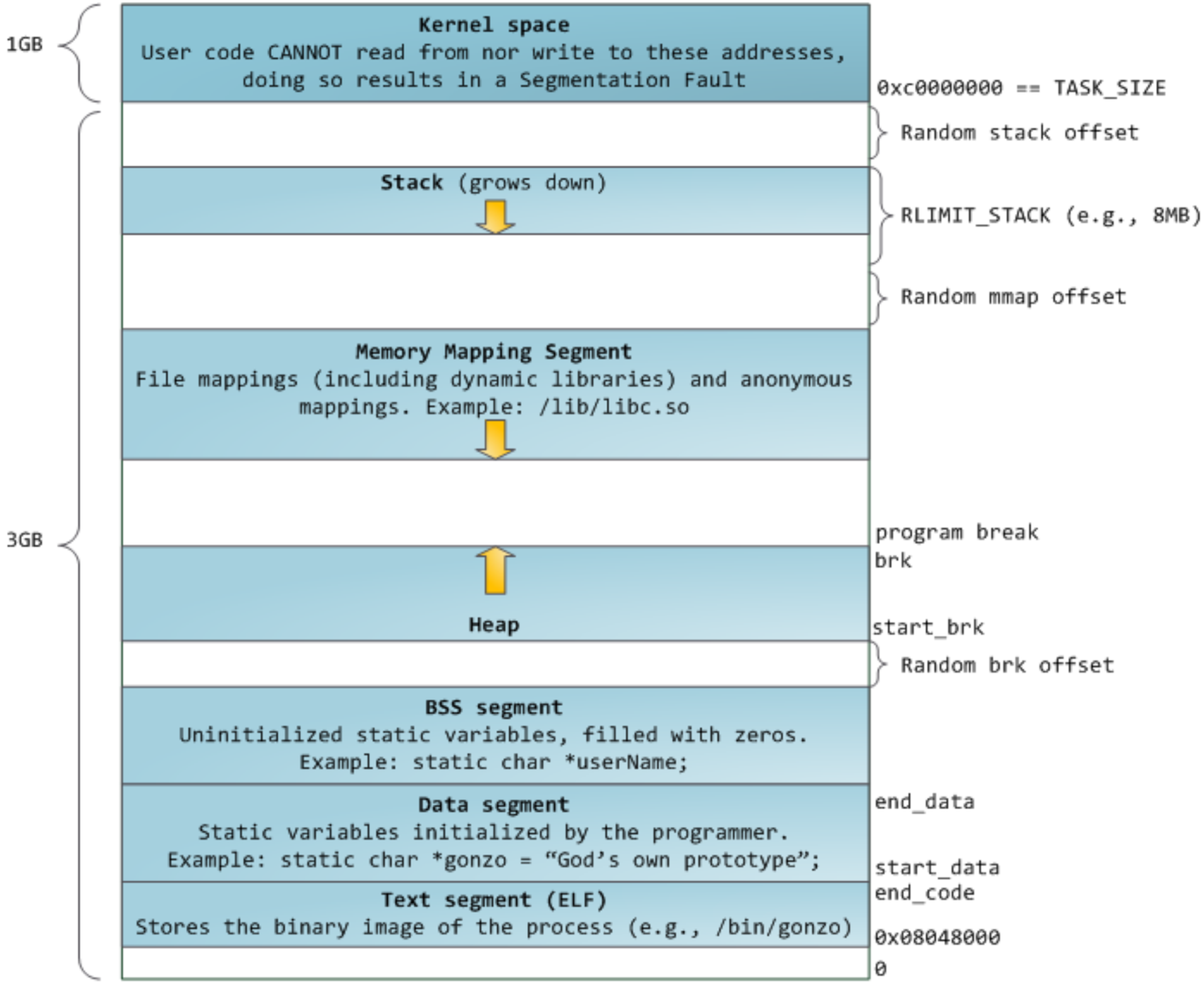

# Background: A C Program to Verify Our Thoughts…

*Some in class exploration — see* ***probe.c***