COL100 PREP

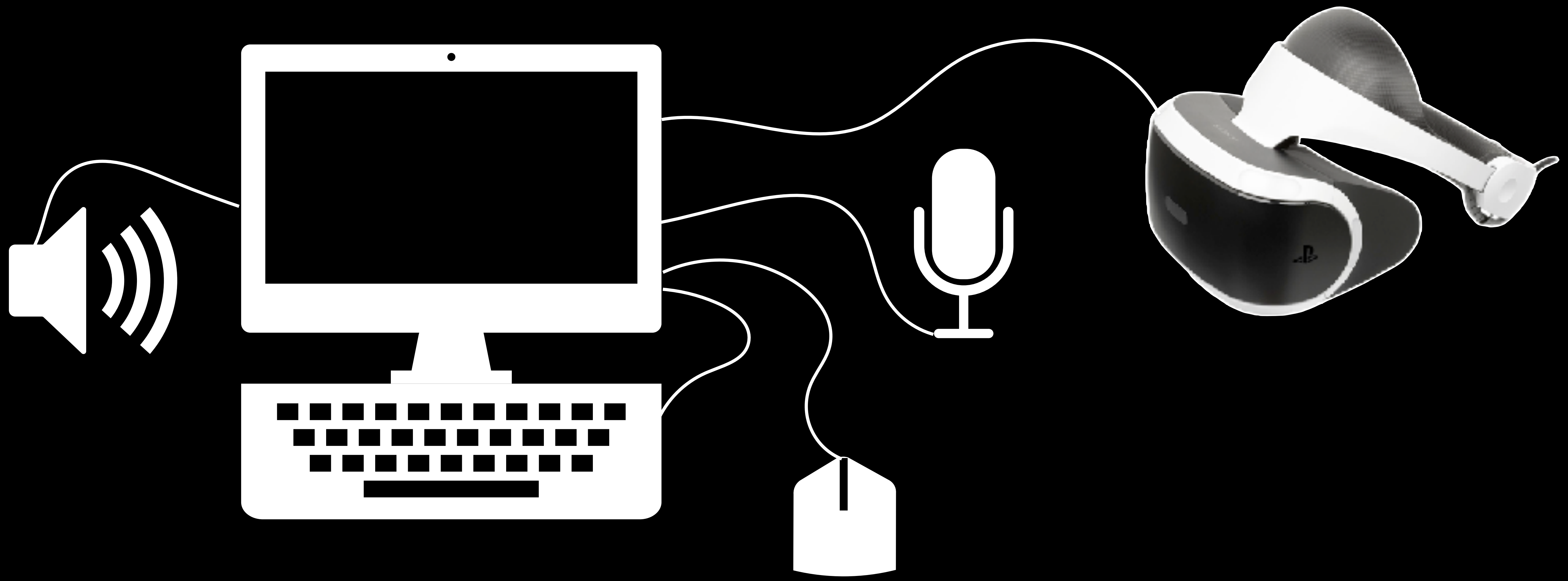
Prep Schedule

- Lecture 945-1115
- Labs:
  - 1130-130
    - am, bb, ce, ch: LH503
    - cs,ee,es: LH 504
  - 3-5
    - me, ms,.mt: LH 503
    - ph,tt: LH 504

About COL100

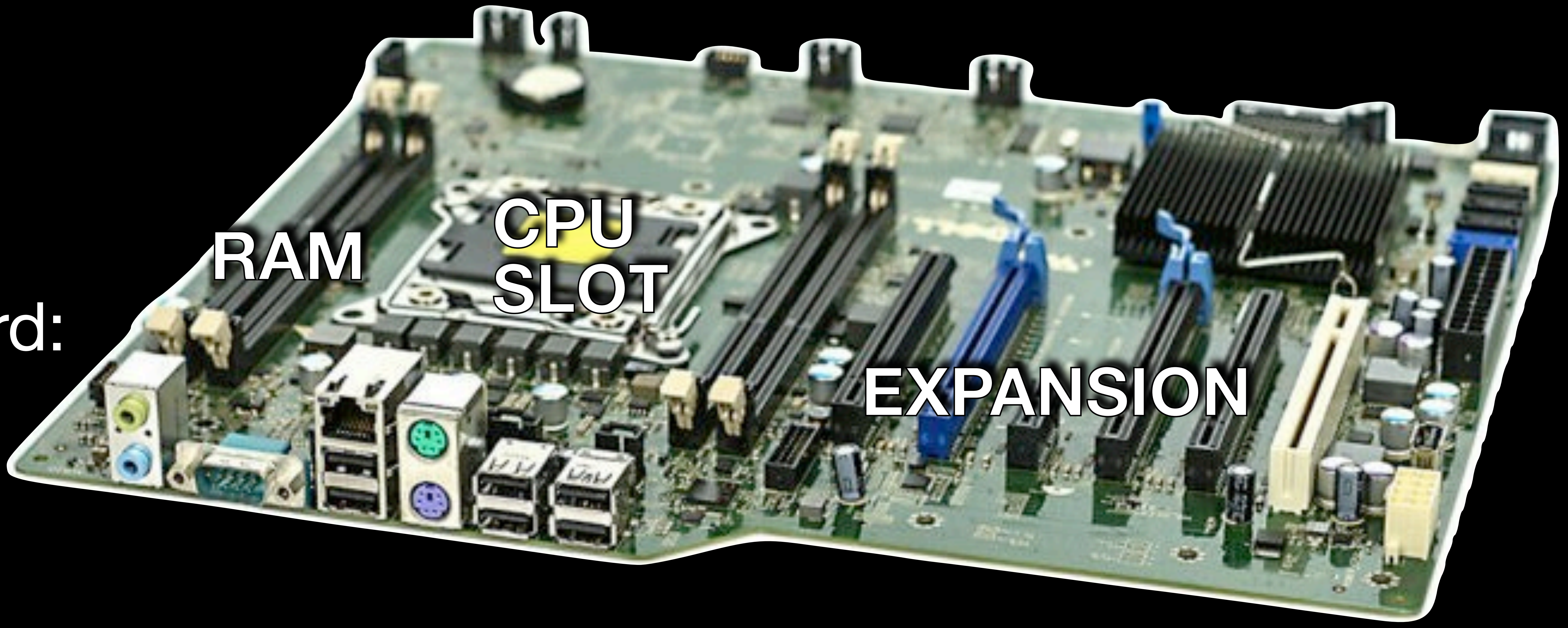
- Introduction to Computer Science
  - Organization of Computing Systems. Concept of an algorithm; termination and correctness. Algorithms to programs: specification, top-down development and stepwise refinement. Problem solving using a functional style; Correctness issues in programming; Efficiency issues in programming; Time and space measures. Procedures, functions. Data types, representational invariants. Encapsulation, abstractions, interaction and modularity. Identifying and exploiting inherent concurrency. Structured style of imperative programming. Introduction to numerical methods. At least one example of large program development.
- Comprehension and Composition
  - Create, design, and express programs
    - Correct logic; Efficient; Understandable — in any language

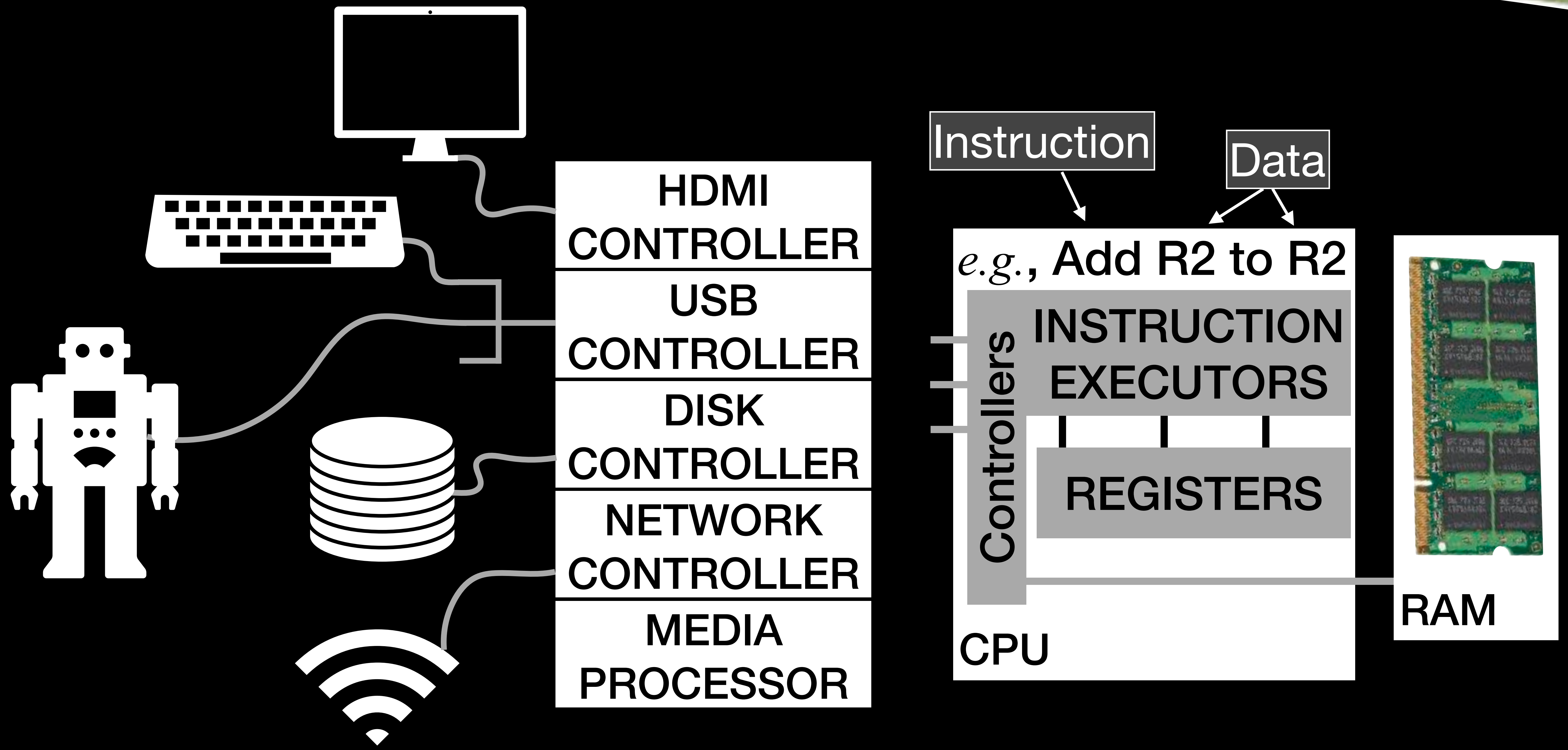
Computer



Essentials

Motherboard:

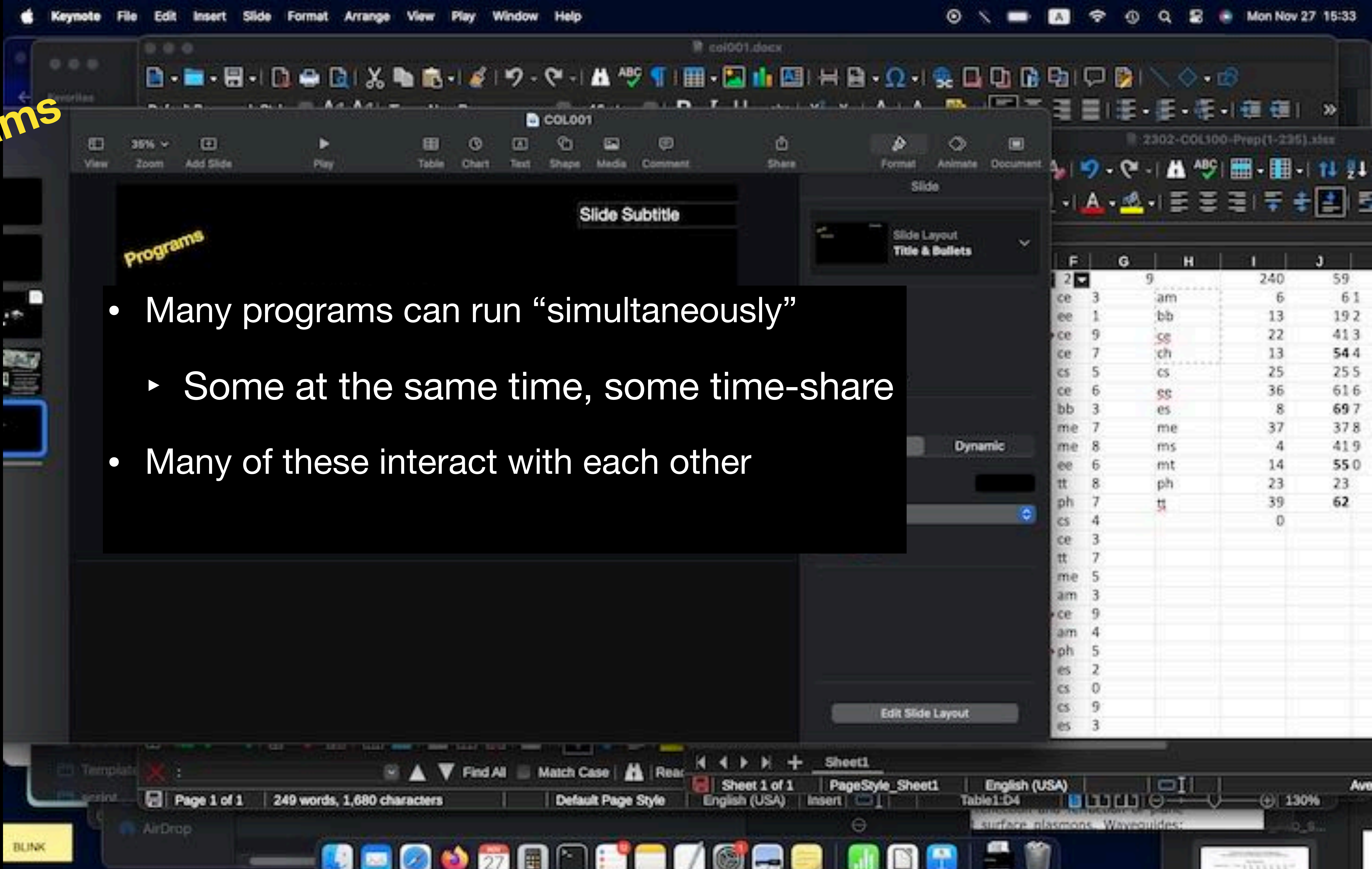




- Multiple active devices
  - with some place to store data
  - Communication protocol
  - Some shared data-store
- Each can operate concurrently on behalf of many “programs”
- Some are “programmable”

Programs

- Many programs can run “simultaneously”
  - Some at the same time, some time-share
- Many of these interact with each other



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ee 1		bb	13	19 2
ce 9		ce	22	41 3
ce 7		ch	13	54 4
cs 5		cs	25	25 5
ce 6		ee	36	61 6
bb 3		es	8	69 7
me 7		me	37	37 8
me 8		ms	4	41 9
ee 6		mt	14	55 0
tt 8		ph	23	23
ph 7		tt	39	62
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Program & Data

Both Program and Data can
.. and do reside in *Memory*

- Programs may reside in files (persistent storage)
  - Could be more than one file
- Running Programs generally require data ↝ Running instance is a *process*
  - Input and Output can also be in one or more files
  - May also by/to user through a peripheral , Or by/to another program
- In its file, the program is just like data: a passive sequence of bytes
  - “Someone” must start to run it (each program has a staring point) ↯ Operating System

Program Execution

- Many interfaces
  - Point with a mouse and click
  - Tap on a touch screen
- Some way to find the program/icon
  - Search?
    - That is itself another program. How to find it?
    - Maybe, a shortcut (Key shortcut, swipe up)
- Give the name of the program to a “program starter”

Navigating Files

- Want to direct “random” access to data
  - Require some way to refer to location (address)
  - Given the location, retrieve contents (which could be a list of items)
- File system resides on disks (Persistent storage)
- Tree like structure
  - Start with root “/“, and traverse branches also denoted by “/“ (unix)
  - Each branch has a name
- Full path provides the precise location of the file on the disk

Develop Program

- Programming environment and execution environment
- Creating a list of instructions
    - Need to know what types of instructions are available
- A language to express the program in
    - Requires translation into “Add R2 to R1” style simple instructions
- Helps to have:
    - Correctness checkers
    - Documentation of language features and grammar

Development Tools

- Editor
- Libraries and Modules
- Debugger
- IDE
- Compiler/Interpreter
- OS/Shell/Launcher
- Process listing
- Result checking