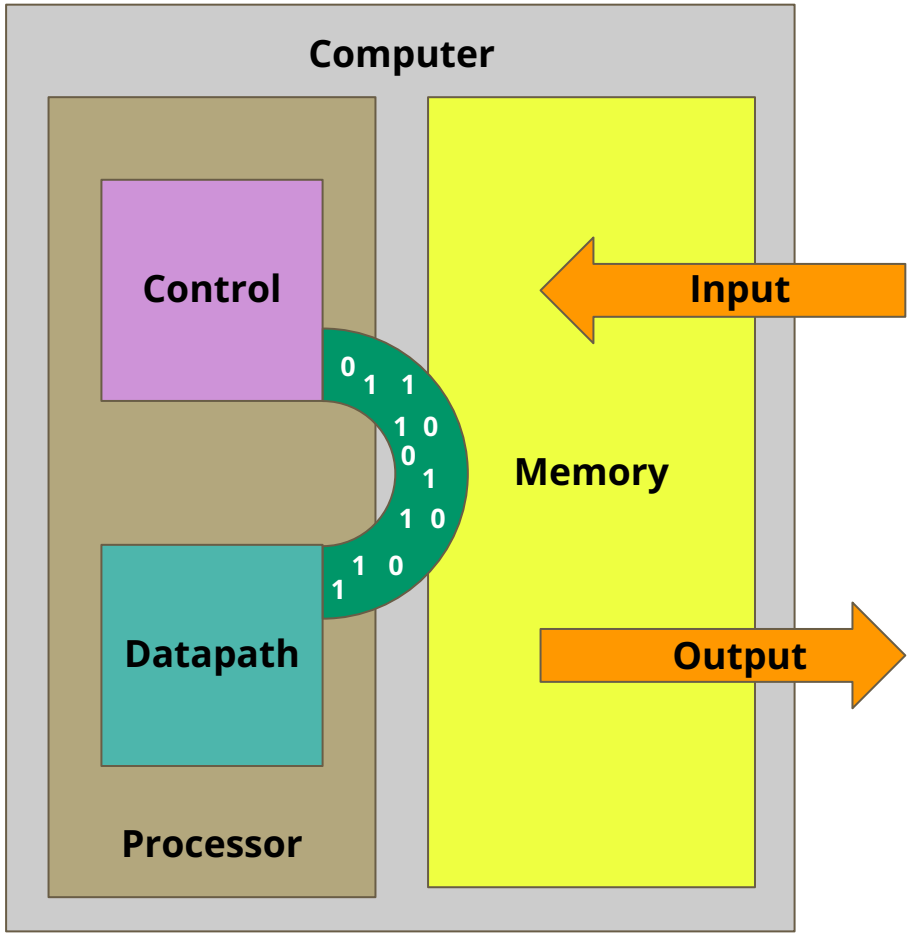
Bits of Architecture

High-Level Computer Organization

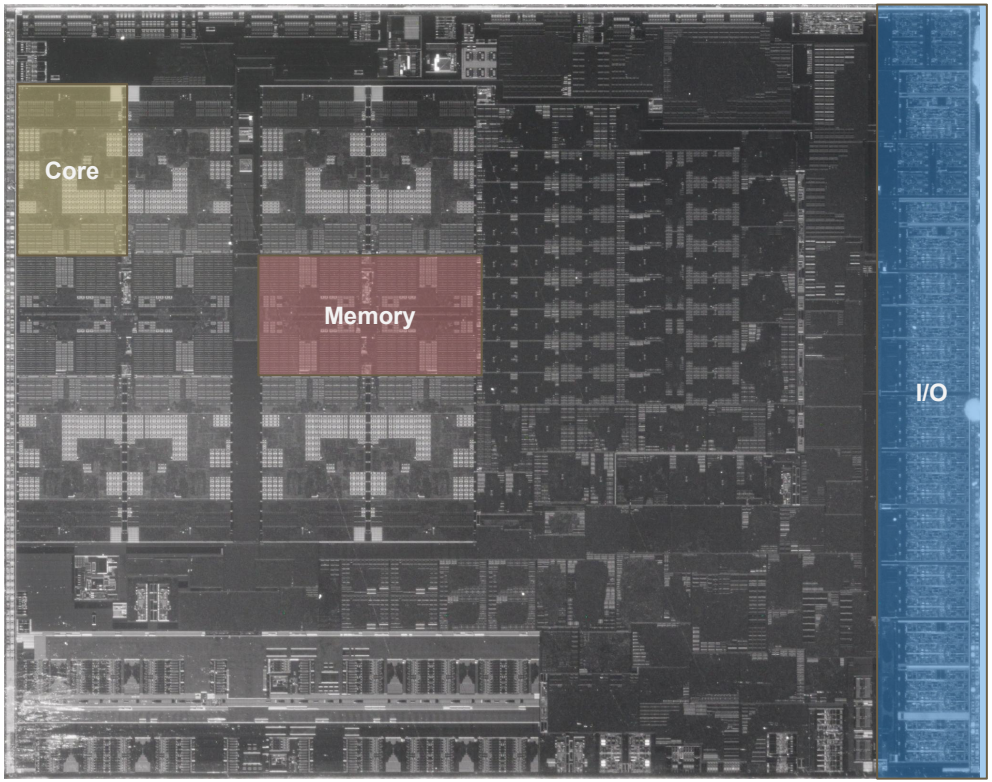
How Are Computers Organized?

What Makes A Computer?

- **Control**
  - Controls the datapath, memory, and I/O via instructions
- **Datapath**
  - Performs arithmetic operations
- **Memory**
  - Storage for programs/data
- **Input**
  - Feeds computer Information
- **Output**
  - Presents computer output



AMD Renoir Die



- **Central Processor Unit (CPU/Processor)**
  - Datapath + Control
  - Signals I/O
  - Caches (as an optimization)

From Fritzchens Fritz - https://www.flickr.com/photos/130561288@N04/50016639913/in/album-72157715067913276/

More On Memory...

Memory Terms

Volatile	Retains data only when powered
DRAM **(Dynamic Random Access Memory)**	Semiconductor memory Density (DRAM > SRAM) Speed (SRAM > DRAM)
SRAM **(Static Random Access Memory)**	

Nonvolatile	Retains data in the absence of power
Magnetic Disk	Rotating platters covered in magnetic recording material
Flash	Semiconductor memory Slower than DRAM+SRAM

More on I/O...

I/O Terms

- **Inputs**
  - Keyboard, Mouse, Microphone, Webcam
- **Outputs**
  - Monitors/Screens, Speakers
- **Both?**
  - **Networks**!
    - **Local Area Network (LAN)**
      - Smaller scale network
      - Single building (or smaller)
    - **Wide Area Network (WAN)**
      - Large-scale network