Outline
what Von Neumann looks like

bus connects ALU/control to memory (RAM) and I/O keyboard, monitor, storage, etc.

1. LOAD A1 R1
2. LOAD A2 R2
3. ADD R1 R2 R3
4. STORE R3 A3
5. HALT
where Von Neuman’s going

There are some issues

- Von Neumann bottleneck

- mortality of Moore’s Law
input, output

for geezers

lots of real estate
to get ideas in, out
doesn’t fit in pocket
storage
hard drive
storage

compact disc
storage
flash drive
bits, files, buffers
protect us from the machine
Machines began to take over setting the program counter to a new job, collecting the output, fetching memory... but it was still one job at a time.
time sharing, version 0.1
one user, one program, one computer
Does one task stop, or only appear to stop, for the other?
unix (mostly) to the desktop
GUIs, time-sharing, networking, flame-wars
an operating system should have

- kernel (shell, shielded access to hardware, referee sharing)

- utilities