1. Building a computer from parts
    a. You know enough at this point to build your own computer
        i. Add two numbers

        ii. Implement other operations like subtract, AND, OR, XOR, so on

        iii. Calculate a running sum of numbers

        iv. Add based on values stored somewhere

2. Von Neumann architecture
    a. Almost all current machine designs based on concepts developed by John von Neumann

    b. Architecture based on following three key concepts

3. Tasks of a computer, as defined by Stallings (from before)
    a. Move data

    b. Process data

    c. Store data

    d. Control

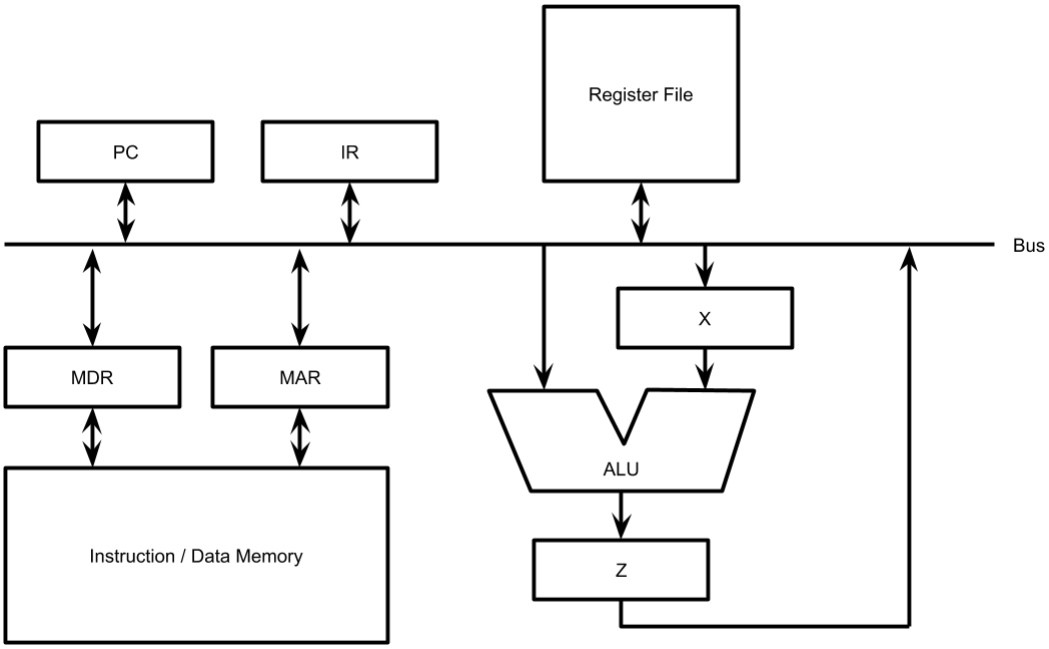
4. Putting together a basic CPU

        i. Alternative

    b. Let's have registers

    c. Keeping track of state

5. Single bus and executing instructions
    a. Simplistic single bus CPU below



    b. Sequence of actions
        i. Fetch

        ii. Decode

        iii. Execute

    c. Example – let's add two memory locations and place result in register file
        i. Get value at first memory location

        ii. Get value at second memory location

        iii. Add things together and place in register file

d. von Neumann bottleneck

i. Idea

ii. Solution

e. Couple of reasons why we can't reduce to 1 cycle

i. Must increment PC to reach next instruction

ii. Complex addressing modes require multiple trips to memory