Home Load Save

- data can be allocated either statically or dynamically
- array variable can be the array (static) or store a pointer to it (dynamic)
- index is generally considered dynamic

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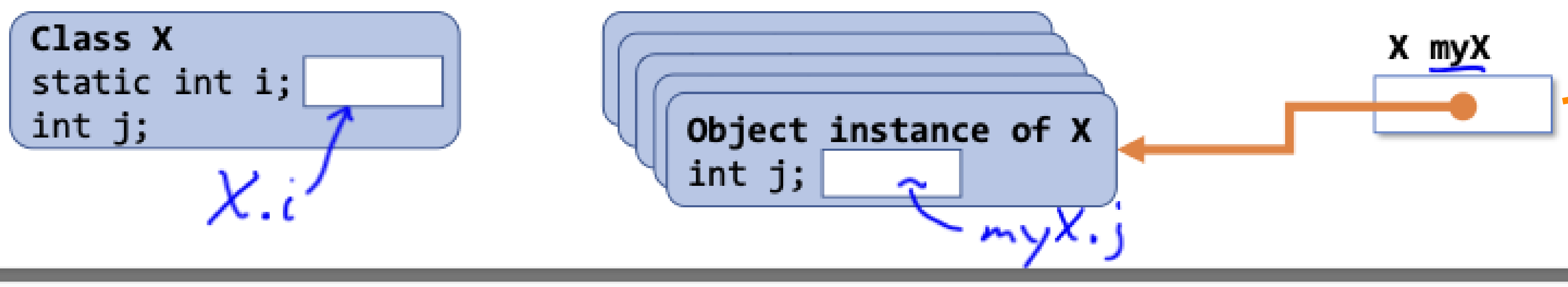
- label: calling location a: for example will give you everything aligned with a
- Directive: .pos = address, .long = value
- Instruction: starts with opcode and piece of information, can be a value $, a register, memory at register
- reg: r0..7
- Literal: any number
- Offset: number
- number: decimal | 0x hex

## Instance Variables

- Variables that are an instance of a class or struct
  - Created dynamically (usually)
  - Many instances of the same class/struct can co-exist
- Java vs C
  - Java: *objects* are instances of non-static variables of a *class*
  - C: *structs* are named variable groups, or one of their instances
- Accessing an instance variable
  - requires a reference/pointer to a particular object/struct
  - then variable name chooses a variable in that object/struct



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- Alternatives for Instruciton sets
  - a = 0
  - Option 1: static address and value
  - Option 2: static address and dynamic value
    i. Load a constant into the register: r[0] ← 0×0
    ii. Take value in the register and store it in memory at the static address: m[0×1000] ← r[0]
    - 5 bytes for immediate value instruction
      - (1/2 bytes) Instruction code, (1/2 bytes)register, one integer
    - 5 bytes for memory instruction
      - Instruction code, register, one integer
  - The ONE WE'RE TAKING Option 3: dynamic address and value
    i. Load constant into a registerr[0] ← 0×0
    ii. Value from register and put into memory with a value provided from a register r[1] ← 0×1000
    - m[r[1]] ← r[0]
    - 2 bytes for memory instruction
      - (1/2 byte) Instruction code, (1/2 byte each) two register indices
      - Extra 1/2 byte we use for something else
    - Base address, index and value are all now in registers

## Structs in C

- A struct is a collection of variables of arbitrary type
  - allocated and accessed together
- Declaration
  - similar to declaring a Java class without methods
  - name is "struct" plus name provided by programmer

instances of

- Structs: named variable groups or one of their instances
  - Collection of variables of whatever type you want
  - Like a class without any methods
  - When naming one, the struct won't be called "D", it will be "struct D"
  - Specify what instances of struct D looks like is what's below