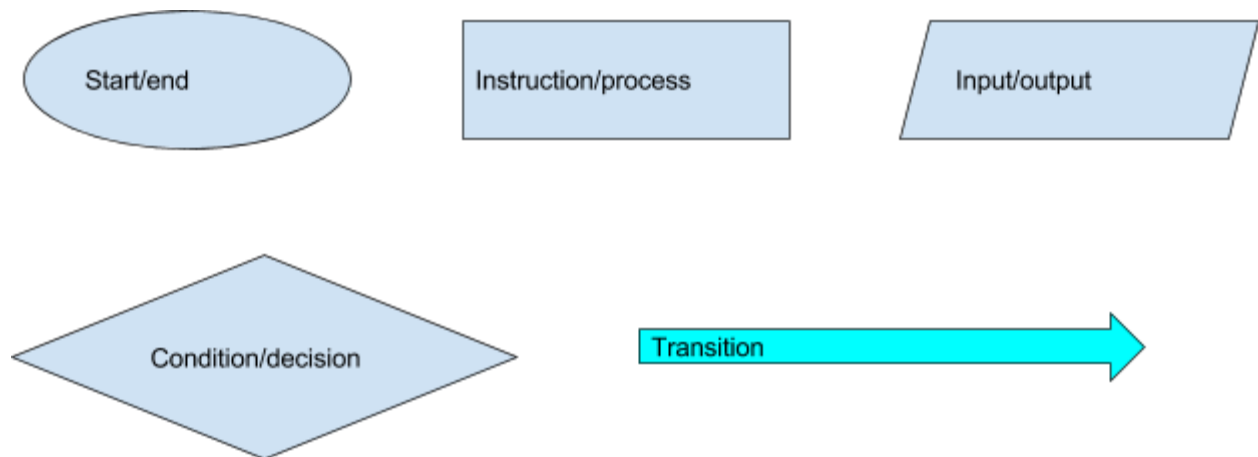# Flowcharts/Algorithms

Algorithms/Programs
- Algorithms: precise/systematic set of instructions designed to solve a problem
    - Even something like a recipe is an algorithm
- Programs are implementations of algorithms, written in some programming language
- *All programs are algorithms, but not all algorithms are programs*

Fetch/Execute Cycle
- Instruction = string of bits (4 bytes) that contain operators, operand, and destination
- Computers can't read human code; must compile them into machine language
- Von Neumann Model phases
    - Fetch instruction from memory
    - Decode/understand instruction
    - Fetch data from memory if needed
    - Execute instruction
    - Return value back to memory

Flowcharts
- Visual way to represent algorithms
- Shapes are connected by arrows to illustrate process

Start/end	Instruction/process	Input/output

Condition/decision	Transition

Flowchart of testing whether a number is odd/even:

Start program → Receive number input

Receive number input → Divide input by 2

Divide input by 2 → Remainder?

Remainder?
- Yes → Output "even"
- No → Output "odd"

Output "even" → End program

Output "odd" → End program