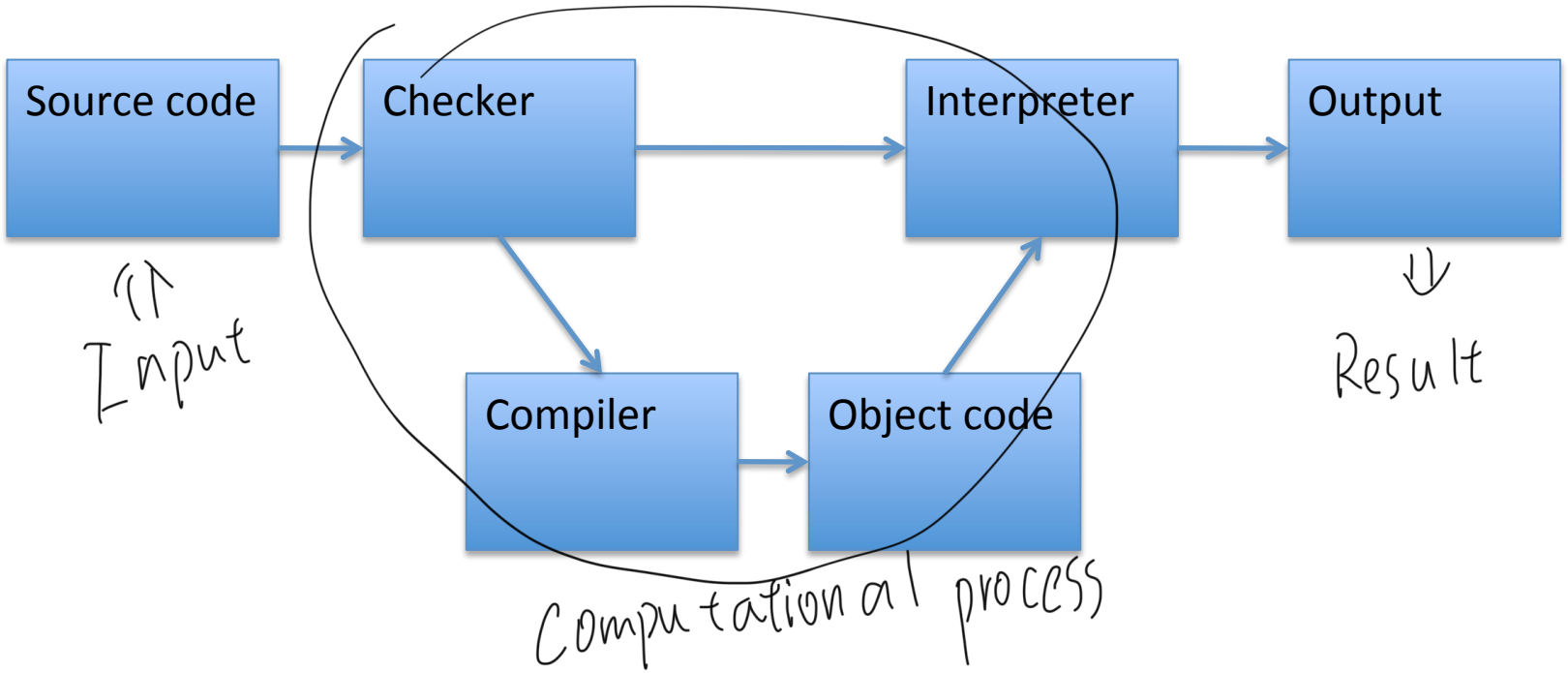
Programming languages

- Goal:
  - Need a way to describe algorithmic steps such that computer can use them to execute process
  - Programming language defines syntax and semantics needed to translate our computational ideas into mechanical steps

put legal expression together

how to deduce meaning

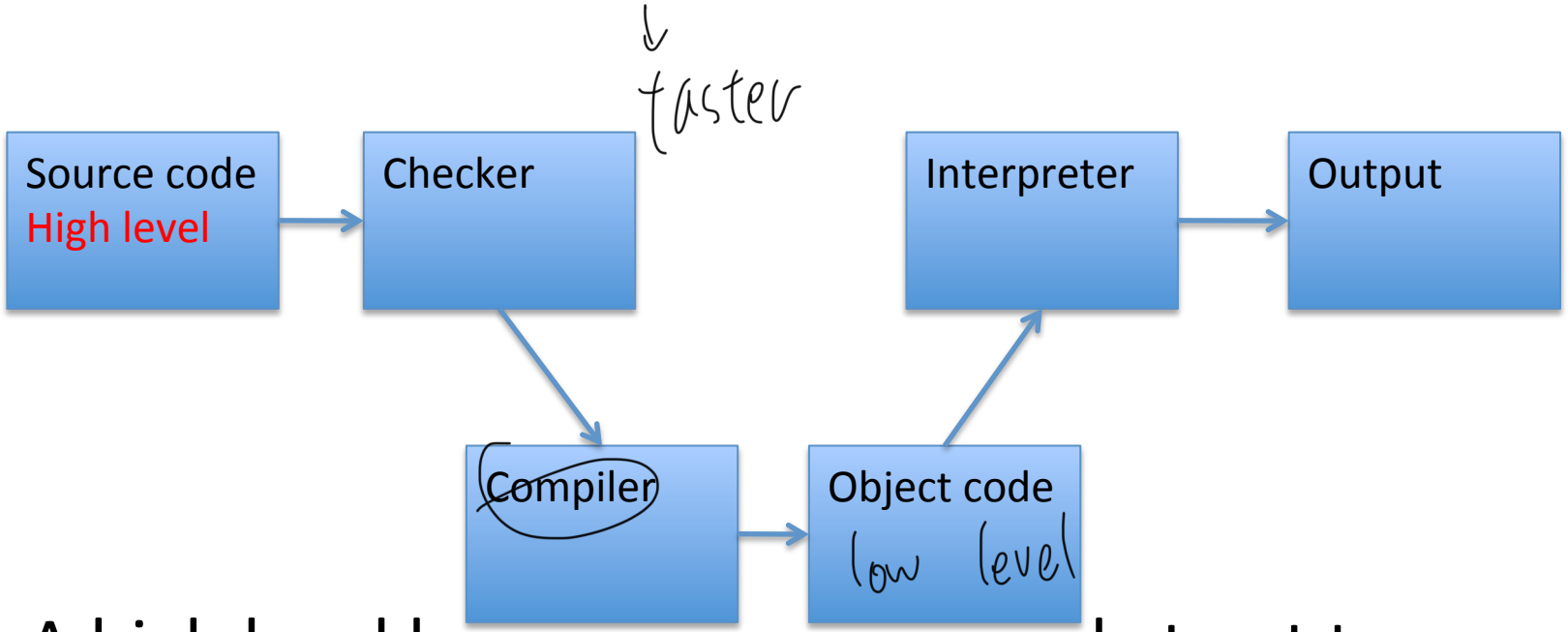
Options for programming languages



Options for programming languages

- Low level language uses instructions similar to internal control unit:
  - Move data from one location to another
  - Execute a simple ALU operation
  - Jump to new point in sequence based on test
- Checker confirms syntax, static semantics correct
- Interpreter just follows sequence of simple instructions

Options for programming languages



- A high level language uses more abstract terms – invert a matrix, compute a function
- In a compiled language, those abstractions are converted back into low level instructions, then executed

Options for programming languages

- In an interpreted language, special program converts source code to internal data structure, then interpreter sequentially converts each step into low level machine instruction and executes
- We are going to use Python, which belongs to this class of programming languages

one instruction at a time