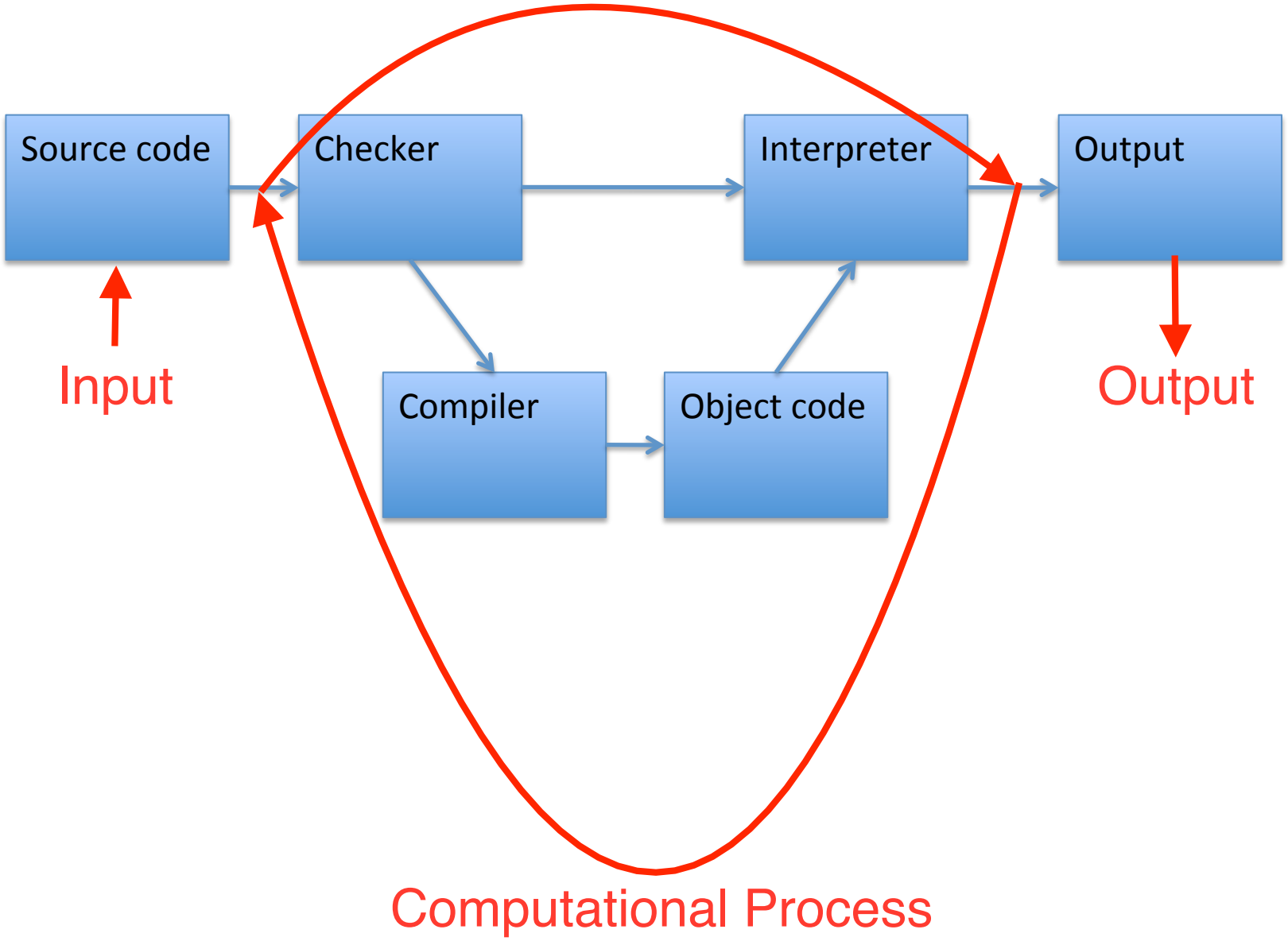
# Programming languages

- 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

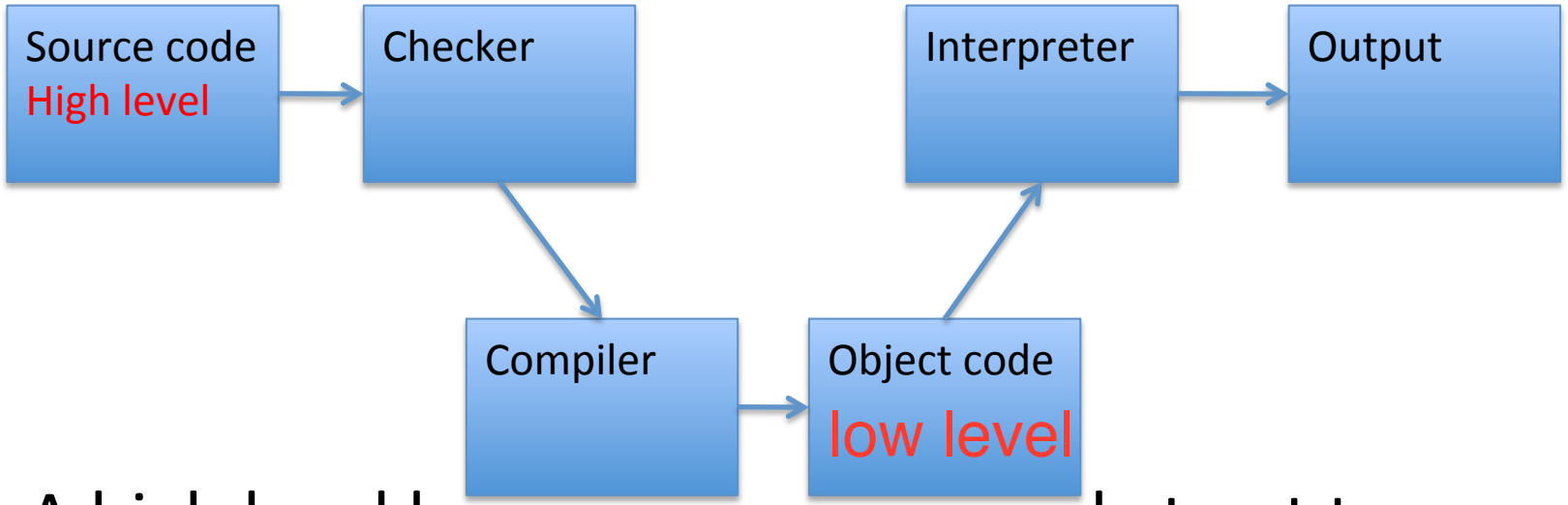
# Options for programming languages



# 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