Character stream
Token stream
Parse tree
Abstract syntax tree with annotations (high-level IF)
Control flow graph with pseudo-instructions in basic blocks (medium-level IF)
Modified control flow graph
Modified control flow graph
Modified control flow graph
(Almost) assembly language (low-level IF)
Modified assembly language
Modified assembly language
Modified assembly language
Final assembly language

Scanner (lexical analysis)
Parser (syntax analysis)
Semantic analysis
Intermediate code generation
Local redundancy elimination
Global redundancy elimination
Loop improvement
Target code generation
Preliminary instruction scheduling
Register allocation
Final instruction scheduling
Peephole optimization

Front end
Back end
Machine-independent
Machine-specific