

Difference between “Single Pass and Multi Pass Compiler”

S. No.	Feature	Single Pass Compiler	Multi Pass Compiler
1	Compilation Process	Passes through each step once, converting tokens instantly	Passes through the source code multiple times
2	Speed	Faster	Comparatively slower
3	Scope	Limited scope, narrow compiler	Greater scope, wide compiler
4	Code Generation	No code optimization, less efficient code generation	Better code generation and optimization
5	Intermediate Code	No intermediate code generation	Intermediate code is generated during the process
6	Compilation Time	Takes less time to compile	Takes more time to compile
7	Examples	Turbo Pascal, Small C compilers	LLVM, Java compilers, Modula-2 languages
8	Optimization	Limited or no optimization	Comprehensive optimization strategies
9	Efficiency	Less efficient code generation	More efficient code generation
10	Error Handling	May lack advanced error handling capabilities	Can implement sophisticated error handling mechanisms
11	Memory Usage	Typically consumes less memory	May consume more memory due to multiple passes
12	Complexity	Simple design and implementation	Can be more complex due to multiple passes and stages
13	Flexibility	Less flexible in handling complex language constructs	More flexibility in handling complex language features
14	Debugging Support	Limited debugging support	Better debugging support with multiple passes
15	Compilation Strategy	Immediate translation of source code to machine code	Multiple passes allow for refined compilation strategy
16	Resource Utilization	Generally requires fewer resources	May require more resources due to multiple passes
17	Learning Curve	Easier to understand and implement	May have a steeper learning curve due to complexity
18	Language Support	Suitable for simpler languages and applications	Suitable for a wide range of languages and applications
19	Portability	May be more portable due to simplicity	May have dependencies that affect portability
20	Build Time	Faster build times due to single pass	Longer build times due to multiple passes