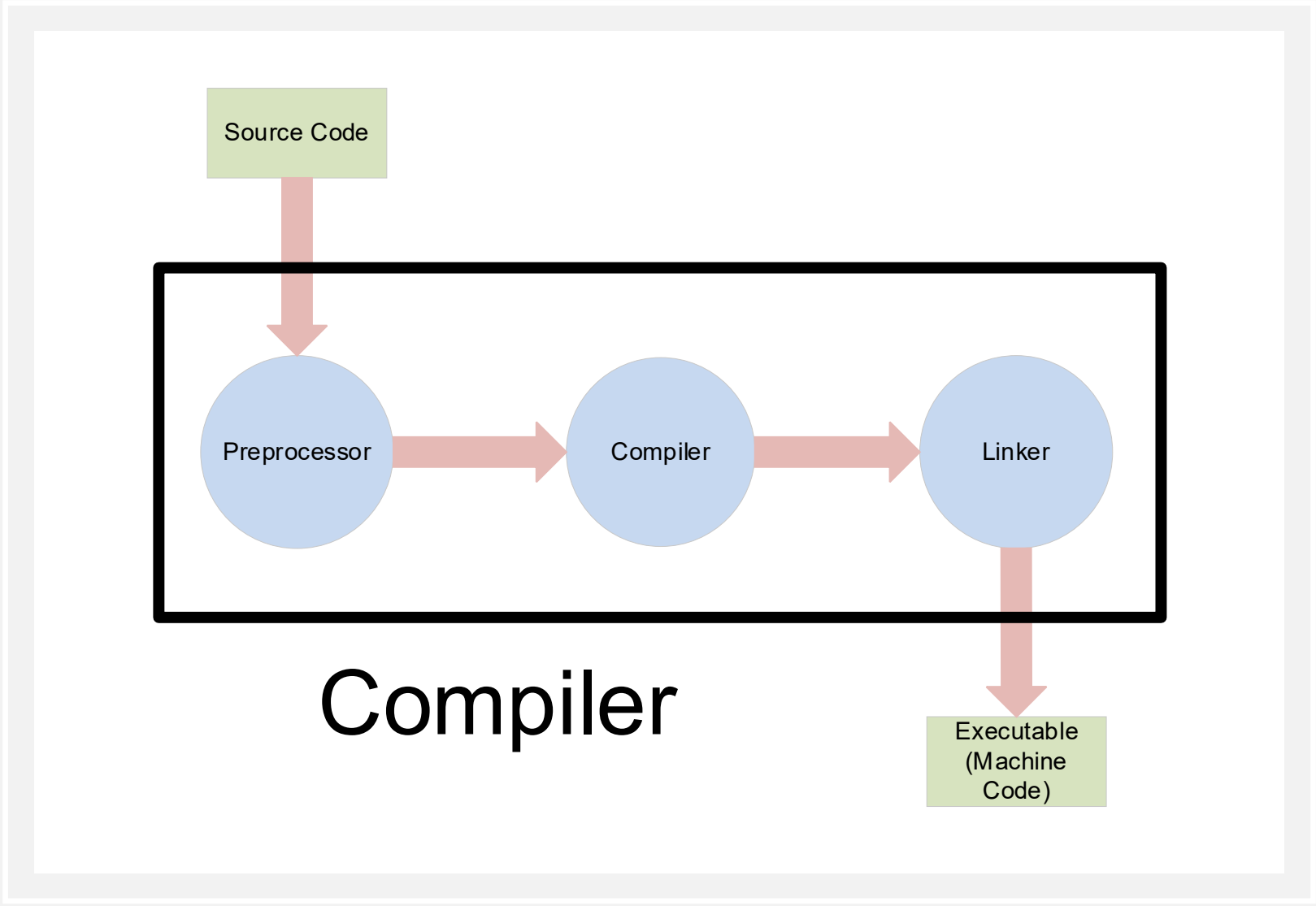
BUGS AND DEBUGGING

If debugging is the process of taking bugs out of a program,

then programming must be the process of putting bugs into a program

Delroy A. Brinkerhoff

THE COMPILER SYSTEM



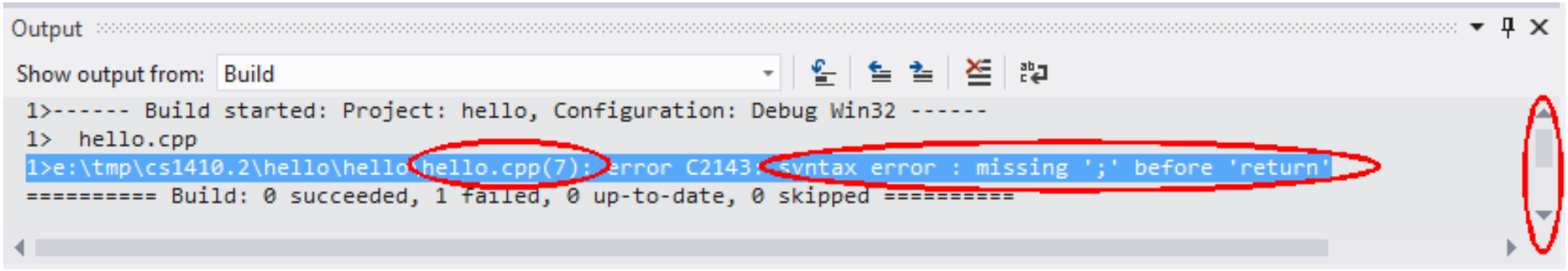
KINDS OF BUGS

- Syntax — incorrect sequence of keywords, punctuation, etc.

SYNTAX ERRORS: "RULES" FOR DEBUGGING

1. Work from the first error to the last (top to bottom)
2. Use the IDE's features to navigate
3. The compiler indicates the line where the error is located, the bug is never below that line but may be above it – work from the indicated line backwards
4. Modern compilers perform "error recovery" which can mask some errors
5. Don't waste time searching for error numbers

SYNTAX ERROR DIAGNOSTIC



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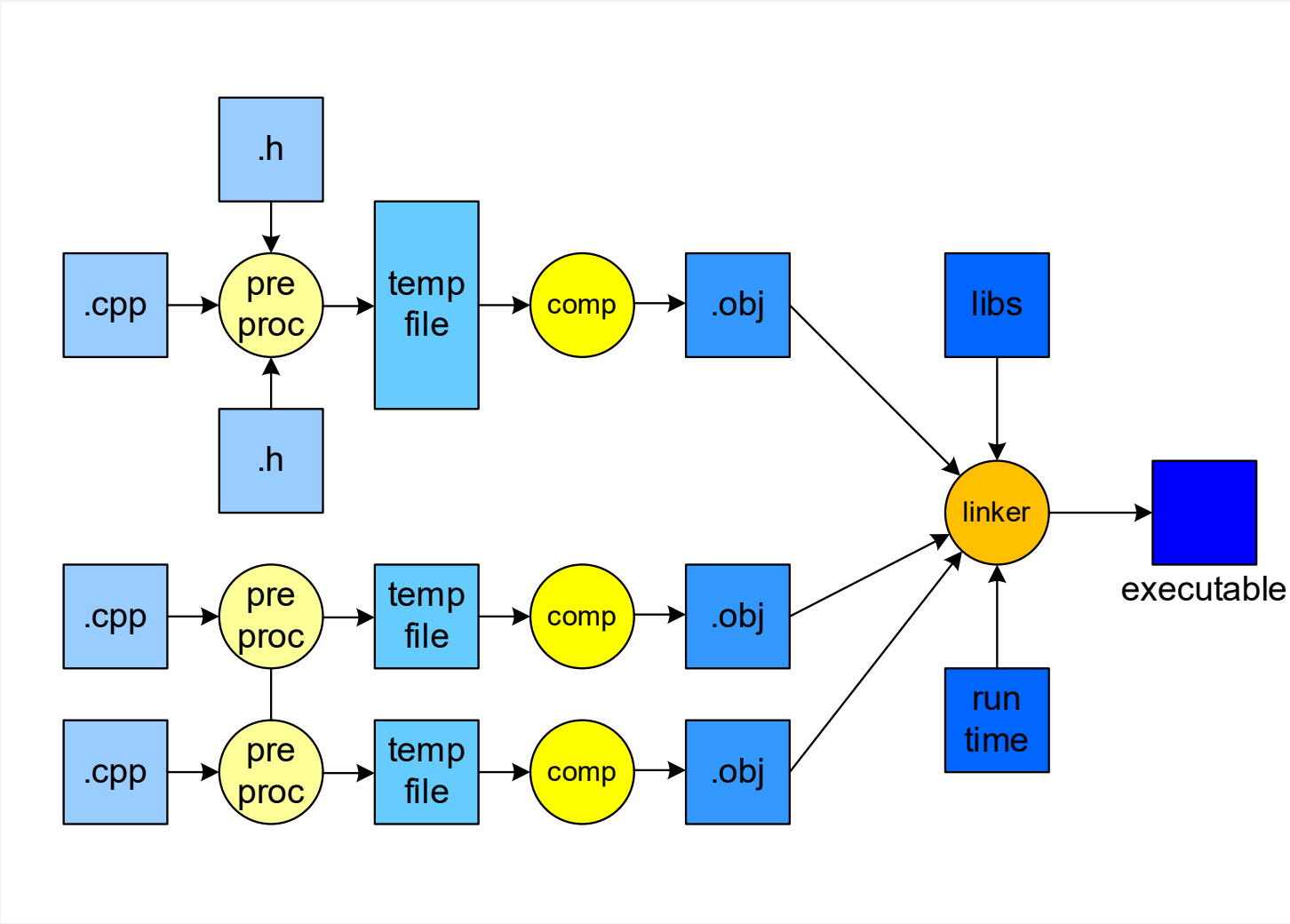
LINK ERROR DIAGNOSTIC

```
1>------ Rebuild All started: Project: Error3, Configuration: Debug Win32 ------
1>C:\Program Files (x86)\MSBuild\Microsoft.Cpp\v4.0\V110\Microsoft.CppClean.targets(75,5):
      warning : Access to the path 'E:\TMP\CS1410 PAST\ERROR3\DEBUG\ERROR3.EXE' is denied.
1>C:\Program Files (x86)\MSBuild\Microsoft.Cpp\v4.0\V110\Microsoft.CppClean.targets(75,5):
      warning : Access to the path 'E:\tmp\cs1410 past\Error3\Debug\Error3.exe' is denied.
1>  Error3.cpp
1>LINK : fatal error LNK1104: cannot open file '***************.exe'
========== Rebuild All: 0 succeeded, 1 failed, 0 skipped ==========
```

THE LINKER ASSEMBLES FILES



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• Task synchronization	multiple tasks do not coordinate correctly
• Heisenbug	program behaves differently while being debugged