Compilation in a nutshell is designed to process source code before execution to optimize efficiency of the program and prevent any errors in the code before it is ran. Compilation uses compilers to compile source code in stages that begin with scanning the code for key words which are put into an hierarchy table. Which are parsed using a specific table of symbols provided via the language the code is in which upon all of this working smoothly will result in the programs execution. Languages such as Visual Basic and C++ are compile based languages. This types of languages and program implementation are great for handling large chunks of data and data manipulation doing so as efficiently as possible. However, these languages also tend to be cumbersome and heavily loaded. Requiring large amounts of necessary memory to store all the extra data needed to process the source code and prepare it for execution. The load times can also be long due to so many programs running before the application is even ran. And when lots of data is being scanned and checked it can lead to very long load times. You have a scanner going through the source code, a linker that links key words of the source code to tables that then get trans piled to machine code which are compiled to run directly on whatever machine the code is being ran on.

Pure implementation is more in accordance with scripting languages such as Python or Golang. These languages use interpreters to in real time during program execution do the work that a compiler does to directly convert the source code to machine code. These programs tend to be light weight and agile but lack many of the defensive programming features that compilation programs have. They also during run time take up more storage space because all the programs necessary to do the basics in running a compiled program are needed during run time of a pure implementation-based program.

Hybrid implementation is a combination of both compiled and pure implemented approaches to program execution. There aren’t many use cases of hybrid implementation but one that is mentioned is the language PERL. In basis, compilers are used to simplify interpreters and detect errors easier while fixing the major issues that both other implementations offer.