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Please write a short description about what you have learnt about from java compilation process. (Does not need to be long, but clearer it is the higher the mark will be).

After writing the source code (.java file), it is converted into machine independent encoding known as Bytecode. Bytecodes are compact numeric codes, constants, and references (numeric addresses) that encode the result of compiler parsing and performing semantic analysis.

During conversion, the source code is parsed into tokens and an AST (abstract syntax tree) is generated. Information on variable names, function names, objects, classes, interfaces, are entered into the symbol table. Source code is analyzed for user defined annotations and handled by producing compiler errors, compiler warning...etc. after the AST is processed and attributed, a “.Class” file is generated.

The class files are generated to allow the program to be run on any system. To run, the main class file is passed to the JVM (java virtual machine). JVM is a program whose purpose is to execute other programs. It allows Java programs to run on any divide or operating system and manage and optimize program memory. After passed to the JVM it undergoes three stages before the final machine code is executed.

* Class Loader: the other classes referenced in the program are loaded through the class loader which is an object that creates a flat name space of class bodies that are referenced by a string name. It is responsible for loading java classes during runtime dynamically to the JVM.
* Bytecode Verifier: after the bytecode of a class is loaded by the class loader, it is checked that the instructions do not perform damaging actions. Checks include initialized variables, method calls match the types of object references, rules of data and methods privacy are not violated, run time stack does not overflow, etc.
* Just-In-time compiler: compiles platform-neutral Java bytecode into native machine code at run time to be executed. No interpretation is done here.