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JDK is a distribution of Java technology, it implements Java language specification and the Java virtual machine specification and provides the standard edition of Java application programming interface  
while the JRE  
JRE stands for Java runtime environment. It is the implementation of JVM (Java virtual machine) and was designed to execute Java program. It is platform dependent. Does not contain development tools.  
  
If the computer is so smart why do we need a compiler?  
A complier is a program that translates the source code for a program from programming language to executable language. A computer only understands low level language which is binary, but us humans only speak high level language which is our normal English. This is where the compiler comes in. It translates our language to language understandable by the computer.

1.4 Fill in the blanks in each of the following statements:

A) The logical unit that receives information from outside the computer for use by the computer is the input unit. B) The process of instructing the computer to solve a problem is called programming.

C) Assembly language is a type of computer language that uses English like abbreviations for machine-language instructions.

D) Output unit is a logical unit that sends information which has already been processed by the computer to various devices so that it may be used outside the computer.

E) Memory unit and Secondary memory are logical units of the computer that retain information.

F) Arithmetic logic unit is a logical unit of the computer that performs calculations.

G) Arithmetic logic unit is a logical unit of the computer that makes logical decisions.

H) High level languages are most convenient to the programmer for writing programs quickly and easily.

I) the only language a computer can directly understand is that computer’s machine language.

J) Central processing unit is a logical unit of the computer that coordinates the activities of all the other logical units.

1.5 Fill in the blanks in each of the following statements:

A) Java is a platform independent programming language that was built with the objective of allowing programs to be written once and then run on a large variety of electronic devices without modification

B) Java Enterprise Edition, Java Micro Edition, and Java Standard Edition are the names of the three editions of Java that can be used to build different kind of applications

C) Bandwidth is the information-carrying capacity of communication lines, and has rapidly increased over the years and become more affordable. Its availability is a cornerstone for building applications that are significantly connected.

D) A(n) assembler is a translator that can convert early assembly-language programs to machine language with reasonable efficiency

1.6 Fill in the blanks in each of the following statements:

A) Java programs normally go through five phases—Edit, Compile, Load, Verify, and Execute

B) A (n) Integrated Development Environment provides many tools that support the software development process, such as editors for writing and editing programs, debuggers for locating logic errors in programs, and many other features.

C) c) The command java invokes the Java Virtual Machine, which executes Java programs.

D) A (n) Virtual Machine is a software application that simulates a computer, but hides the underlying operating system and hardware from the programs that interact with it.

E) The Class Loader takes the .class files containing the program’s bytecodes and transfers them to primary memory.

F) The Bytecode Verifier examines bytecodes to ensure that they’re valid.

1.7 Explain what a just-in-time (JIT) compiler of Java does.

A just-in-time (JIT) compiler is a component of the Java Virtual Machine. Just before the code is executed, a just-in-time (JIT) compiler, a part of the Java Virtual Machine, converts Java bytecode into machine code. By examining the Java code and determining the sections that are frequently executed, it improves the performance of Java programs. The JIT compiler then converts those frequently used sections into machine code so that the processor of the computer can execute it immediately.Platform independence is yet another advantage that Java programs can enjoy thanks to the JIT compiler. The resulting machine code is unique to the hardware platform it's running on because the JIT compiler compiles the bytecode to machine code at runtime. This means that without any modifications, the same Java program can run on various hardware platforms.

1.8 One of the world’s most common objects is a wrist watch. Discuss how each of the following terms and concepts applies to the notion of a watch: object, attributes, behaviors, class, inheritance (consider, for example, an alarm clock), modeling, messages, encapsulation, interface and information hiding.

When comparing a wristwatch to object-oriented programming, it can be seen that both are common objects that many people use on a daily basis. For instance, a watch has the features like time, date, and different hands, and it can show time, set the time, change the date, and set an alarm.A class serves as a model for building objects with similar characteristics and behaviors. A wristwatch is a member of a class of objects that include other time-telling instruments like wall clocks or pocket watches and that have similar characteristics and behaviors. A new class is created by inheriting properties and methods from an existing class, according to the concept of inheritance. A good example of a subclass is an alarm clock.alarm clock is a part of a wristwatch which adds the alarm feature to it.When modeling a wristwatch, its attributes, behaviors, and connections to other objects are specified in a software model.The way objects communicate with one another is through messages, and in the case of a wristwatch, this may involve pressing a button to initiate a particular behavior. Encapsulation is the idea of keeping an object's implementation details hidden and only revealing the information that is absolutely necessary to the outside world. When using a wristwatch, the user only needs to interact with the interface (buttons, a crown, etc.) and is not required to be aware of all the internal workings of the device.The buttons, crown, and display that the user interacts with on a wristwatch are all part of the interface, which is a group of methods that define how the object behaves. The act of concealing implementation-specific information, such as how a watch keeps time or sets off an alarm, ]is information hiding. The user only needs to understand how to use the watch's interface to carry out certain tasks as a result of this.