

## Pencil & Paper 01

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### 1. What data would you give to a program that computes the average of three numbers?

A primitive with the data type *float* is capable of storing an average (mean) value. It is likely that the returned value from the calculation will not be a whole number, which results in an inaccurate value if the numbers following the decimal are discarded—this occurs when another data type is used, such as *int* or *long*. The data type *double* may also be used instead of *float* and allows for increased precision.

### 2. What data would you give to a program that computes the square root of a number?

Again, the data types *float* or *double* would be appropriate to use in this case, since square root computations rarely result in whole numbers.

### 3. Is Java a high-level or a low-level programming language?

Java is a *high-level programming language*. The Java Runtime Environment runs on top of the host OS.

### 4. What is a source program (aka, source code)?

*Source code* refers to the typed commands and instructions within a text document that makes up an executable program upon compilation. *Source code* is also referred to as the "input program" by our textbook.

### 5. What does the Java compiler do?

The Java compiler changes source code into an intermediate language called *byte code* which can then be executed by the Java Runtime Environment.

### 6. What do you call the program that translates Java bytecode into machine-language instructions?

The *Java JIT* (or "Just In Time") compiler.

### 7. Suppose that *janet* is an object that has a method called *speak* that takes one argument, a *String*. Write an invocation of the method *speak* by the object *janet*, using the argument "Hello".

The method may be invoked with the following line of code:

```
janet.speak("Hello");
```

### 8. Suppose you define a class named *Snack* in a file. What name should the file have?

The name of the file must be the same as the name of the class, in this case *Snack*. This name is also case-sensitive, like the Java language itself. The extension for the file must be *.java*. The full name of this file must be the following:

```
Snack.java
```

### 9. What is the command to compile *Snack*? What will be the name of the resulting bytecode (assuming *Snack* successfully compiles)?

The command to compile *Snack.java* will be the following:

```
javac Snack.java
```

**10. Assuming the class *Snack* contains a complete Java program, and has been successfully compiled, what is the command to run the program *Snack*?**

The command to run the compiled program *Snack.class* will be the following:

```
java Snack
```

(The *.class* file extension is omitted when starting a Java program.)