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```
import java.io.*;
import java.util.Date;

public class SaveDate {

    public static void main(String args[]) throws IOException {
        FileOutputStream fos = new FileOutputStream("date.txt");
        ObjectOutputStream oos = new ObjectOutputStream(fos);
        Date date = new Date();
        oos.writeObject(date);
        oos.flush();
        oos.close();
        fos.close();
    }
}
```

funky-data / Getty Images

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A variable is a container that holds values that are used in a **Java program**. To be able to use a variable it needs to be declared. Declaring variables is normally the first thing that happens in any program.

How to Declare a Variable

Java is a strongly typed programming language. This means that every variable must have a data type associated with it. For example, a variable could be declared to use one of the eight **primitive data types**: byte, short, int, long, float, double, char or boolean.

A good analogy for a variable is to think of a bucket. We can fill it to a certain level, we can replace what's inside it, and sometimes we can add or take



or remove sand from the bucket. Anytime we try and put anything else into it, we will get stopped by the bucket police. In Java, you can think of the compiler as the bucket police. It ensures that programmers declare and use variables properly.

To declare a variable in Java, all that is needed is the data type followed by the variable name:

```
int numberOfDays;
```

In the above example, a variable called "numberOfDays" has been declared with a data type of int. Notice how the line ends with a semi-colon. The semi-colon tells the Java compiler that the declaration is complete.

Now that it has been declared, numberOfDays can only ever hold values that match the definition of the data type (i.e., for an int data type the value can only be a whole number between -2,147,483,648 to 2,147,483,647).

Declaring variables for other data types is exactly the same:

```
byte nextInStream;  
short hour;  
long totalNumberOfStars;  
float reactionTime;  
double itemPrice;
```

Initializing Variables

Before a variable can be used it must be given an initial value. This is called initializing the variable. If we try to use a variable without first giving it a value:

```
int numberOfDays;  
//trv and add 10 to the value of numberOfDavs
```



```
variable numberOfDays might not have been initialized
```

To initialize a variable we use an assignment statement. An assignment statement follows the same pattern as an equation in mathematics (e.g., $2 + 2 = 4$). There is a left side of the equation, a right side and an equals sign (i.e., "=") in the middle. To give a variable a value, the left side is the name of the variable and the right side is the value:

```
int numberOfDays;  
    numberOfDays = 7;
```

In the above example, `numberOfDays` has been declared with a data type of `int` and has been given an initial value of 7. We can now add ten to the value of `numberOfDays` because it has been initialized:

```
int numberOfDays;  
    numberOfDays = 7;  
    numberOfDays = numberOfDays + 10;  
    System.out.println(numberOfDays);
```

Typically, the initializing of a variable is done at the same time as its declaration:

```
//declare the variable and give it a value all in one  
statement  
int numberOfDays = 7;
```

Choosing Variable Names

The name given to a variable is known as an identifier. As the term suggests, the



There are certain rules for identifiers:

- reserved words cannot be used.
- they cannot start with a digit but digits can be used after the first character (e.g., name1, n2ame are valid).
- they can start with a letter, an underscore (i.e., "_") or a dollar sign (i.e., "\$").
- you cannot use other symbols or spaces (e.g., "%", "^", "&", "#").

Always give your variables meaningful identifiers. If a variable holds the price of a book, then call it something like "bookPrice". If each variable has a name that makes it clear what it's being used for, it will make finding errors in your programs a lot easier.

Finally, there are naming conventions in Java that we would encourage you to use. You may have noticed that all the examples we have given follow a certain pattern. When more than one word is used in combination in a variable name the words following the first one are given a capital letter (e.g., reactionTime, numberOfDays.) This is known as mixed case and is the preferred choice for variable identifiers.

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