

/*J2A5 Java Data Types, Variables and Assignment

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Chapter 8 - Primitive Data

1. What is a data type?

a named location in main memory which uses a particular data type to hold a value.

2. What does case sensitive mean? Give an example to illustrate.

Case sensitive refers to when the Case of certain data types are important. Ex: Byte.

Chapter 9A – Variables and the Assignment Statement

3. What is a variable?

variable — a named location in main memory which uses a particular data type to hold a value.

4. What is a variable declaration?

A **declaration** of a variable is where a program says that it needs a variable. For our small programs, place declaration statements between the two braces of the `main` method.

5. What does syntax mean in a computer language?

The word **syntax** means the grammar of a programming language. We can talk about the syntax of just a small part of a program, such as the syntax of variable declaration.

6. Give examples of the syntax used to declare variables in Java?

There are several ways to declare variables:

```
dataType    variableName;
```

- This declares a variable, declares its data type, and reserves memory for it. It says nothing about what value is put in memory. (Later in these notes you will learn that in some circumstances the variable is automatically initialized, and that in other circumstances the variable is left uninitialized.)

```
dataType    variableName  =  initialValue  ;
```

- This declares a variable, declares its data type, reserves memory for it, and puts an initial value into that memory. The initial value must be of the correct data type.

```
dataType    variableNameOne, variableNameTwo ;
```

- This declares *two* variables, both of the same data type, reserves memory for each, but puts nothing in any variable. You can do this with more than two variables, if you want.

```
dataType    variableNameOne  =  initialValueOne,  
                variableNameTwo =  initialValueTwo ;
```

7. What are the rules for naming variables in Java?

- Use only the characters 'a' through 'z', 'A' through 'Z', '0' through '9', character '_', and character '\$'.
- An identifier can not contain the space character.
- Do not start with a digit.
- An identifier can be any length.
- Upper and lower case count as different characters.
 - SUM and Sum are different identifiers.
- An identifier can not be a reserved word.
- An identifier must not already be in use in this part of the program.

8. What is a reserved word? Give some examples.

reserved word is a word which has a predefined meaning in Java.

9. Do reserved words affect your choice of name for a variable? If so, how?

For example `int`, `double`, `true`, and `import` are reserved words. Rather than worry about the complete list of reserved words, just remember to avoid using names that you

know already mean something, and be prepared to make a change if you accidentally use a reserved word you didn't know.

10. What is an assignment statement? What is the syntax for an assignment statement?

An assignment statement changes the value that is held in a variable. The assignment statement puts the value 123 into the variable. In other words, while the program is executing there will be a 64 bit section of memory that holds the value 123.

11. Give some examples of assignment statements and explain how they work. That is, explain the semantics of the statements.

```
variableName = expression ;
```

- The equal sign **=** is the assignment operator.
- *variableName* is the name of a variable that has been declared previously in the program.
- *expression* is a collection of characters that calls for a value to be calculated.

Here are some example assignment statements (assume that the variables have already been declared):

```
total = 3 + 5;
```

```
price = 34.56;
```

```
tax = total*0.05;
```

12. What is an expression? Give some examples.

An **expression** is a combination of literals, operators, variable names, and parentheses used to calculate a value.

This (slightly incomplete) definition needs some explanation:

- literal — characters that directly give you a value, like: 3.456
- operator — a symbol like plus $+$ or times $*$ that asks for an arithmetic operation.
- variable — a section of memory containing a value.
- parentheses — (and) .