Java Programming Language SE - 6

Module 3 : Identifiers, Keywords, and Types

Team Emertxe

ORACLE®
Certified Professional
Java SE 6 Programmer

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Objectives

- Use comments in a source program
- Distinguish between valid and invalid identifiers
- Recognize Java technology keywords
- List the eight primitive types
- Define literal values for numeric and textual types
- Define the terms primitive variable and reference variable

Objectives

- Declare variables of class type
- Construct an object using new
- Describe default initialization
- Describe the significance of a reference variable
- State the consequences of assigning variables of class type

Relevance

- Do you know the primitive Java types?
- Can you describe the difference between variables holding primitive values as compared with object references?

Comments

The three permissible styles of comment in a Java technology program are:

```
// comment on one line

/* comment on one

* or more lines

*/

/** documentation comment

* can also span one or more lines

*/
```

Semicolons, Blocks, and White Space

- A statement is one or more lines of code terminated by a semicolon (;):

```
totals = a + b + c
+ d + e + f;
```

- A block is a collection of statements bound by opening and closing braces:

```
{
x = y + 1;
y = x + 1;
}
```

Semicolons, Blocks, and White Space

A class definition uses a special block:

```
public class MyDate {
private int day;
private int month;
private int year;
}
```

Semicolons, Blocks, and White Space

You can nest block statements:

```
while ( i < large ) {
a = a + i;
// nested block
if ( a == max ) {
b = b + a;
a = 0;
}
i = i + 1;
}
```

Semicolons, Blocks, and White Space

Any amount of white space is permitted in a Java:

For example:

```
{int x;x=23*54;}
```

is equivalent to:

```
{
int x;
x = 23 * 54;
}
```

Identifiers

Identifiers have the following characteristics:

- Are names given to a variable, class, or method
- Can start with a Unicode letter, underscore (_), or dollar sign ($)
- Are case-sensitive and have no maximum length
- Examples:

  identifier

  userName

  user_name

  _sys_var1

  $change

Keywords

- abstract continue for new switch
- assert default goto package synchronized
- boolean do if private this
- break double implements protected throw
- byte else import public throws
- case enum instanceof return transient
- catch extends int short try
- char final interface static void
- class finally long strictfp volatile
- const float native super while

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Primitive Types

The Java programming language defines eight primitive types:

- Logical – boolean
- Textual – char
- Integral – byte, short, int, and long
- Floating – double and float

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Java Reference Types

- In Java technology, beyond primitive types all others are reference types.
- A reference variable contains a handle to an object.
  - Car c = new Car();
  - C is a reference variable

Constructing and Initializing Objects

- Calling new Xyz() performs the following actions:

  a. Memory is allocated for the object.

  b. Explicit attribute initialization is performed.

  c. A constructor is executed.

  d. The object reference is returned by the new operator.

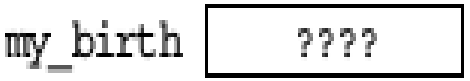
- The reference to the object is assigned to a variable.
- An example is:

```
MyDate my_birth = new MyDate(22, 7, 1964);
```

Memory Allocation and Layout

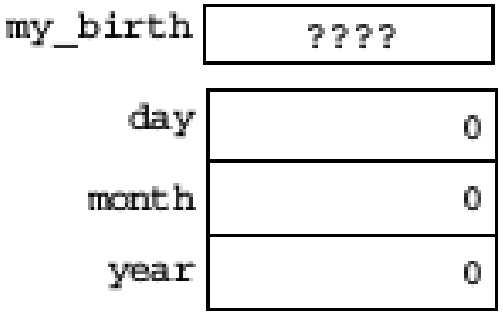
- A declaration allocates storage only for a reference:

  MyDate my_birth = new MyDate(22, 7, 1964);



- Use the new operator to allocate space for MyDate:

  MyDate my_birth = new MyDate(22, 7, 1964);



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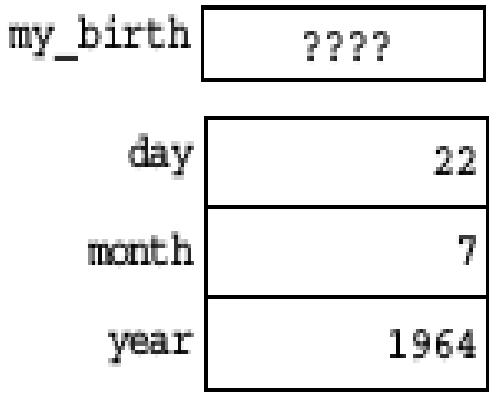
Executing the Constructor

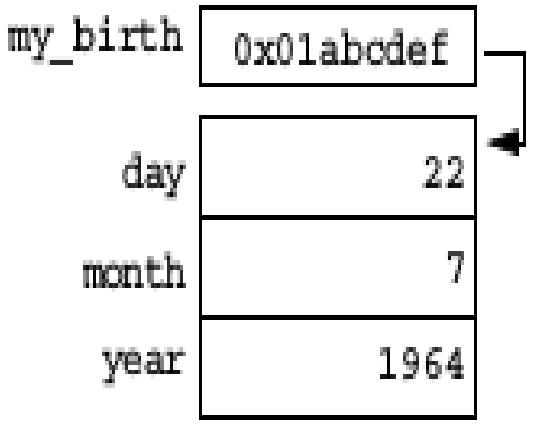
- MyDate my_birth = new MyDate(22, 7, 1964);



Assigning a Variable

- Assign the newly created object to the reference variable as follows:

  MyDate my_birth = new MyDate(22, 7, 1964);



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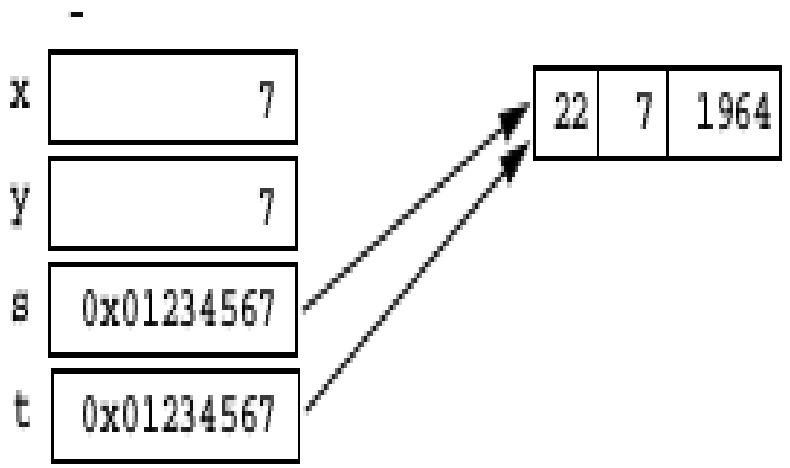
Assigning References

Two variables refer to a single object:

```
int x = 7;
int y = x;
MyDate s = new MyDate(22, 7, 1964);
MyDate t = s;
```



Pass-by-Value

- In a single virtual machine, the Java programming language only passes arguments by value.
- When an object instance is passed as an argument to a method, the value of the argument is a reference to the object.
- The contents of the object can be changed in the called method, but the original object reference is never changed.

Pass-by-Value

```
public class PassTest {
// Methods to change the current values
public static void changeInt(int value) {
value = 55;
}
public static void changeObjectRef(MyDate ref) {
ref = new MyDate(1, 1, 2000);
}
public static void changeObjectAttr(MyDate ref){
ref.setDay(4);
}
```

The this Reference

- this keyword can be used to refer current class instance variable.
- this() can be used to invoke current class constructor.
- this keyword can be used to invoke current class method (implicitly)
- this can be passed as an argument in the method call.
- this can be passed as argument in the constructor call.
- this keyword can also be used to return the current class instance.

Java Programming Language Coding Conventions

- Packages:
  - com.example.domain;
- Classes, interfaces, and enum types:
  - SavingsAccount
- Methods:
  - GetAccount()
- Variables:
  - currentCustomer
- Constants:
  - HEAD_COUNT

Java Programming Language Coding Conventions

- Control structures:

```
if ( condition ) {
statement1;
} else {
statement2;
}
```

- Spacing:
  - Use one statement per line.
  - Use two or four spaces for indentation.

Java Programming Language Coding Conventions

- Comments:
  - Use // to comment inline code.
  - Use /** documentation */ for class members.

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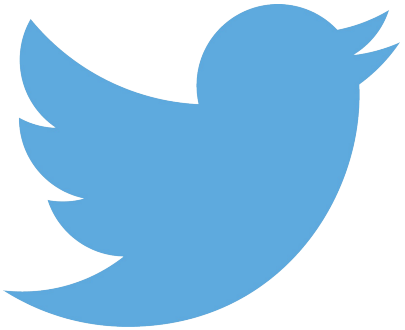
Emertxe Information Technologies,
No-1, 9th Cross, 5th Main,
Jayamahal Extension,
Bangalore, Karnataka 560046
T: +91 80 6562 9666
E: training@emertxe.com

https://www.facebook.com/Emertxe



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