

Unit 6
- Variables
- Fundamental Data Types



Variables

- A variable is a “named container” that holds a value.
- Example: $q = 100 - q$; ←

means:

- 1. Read the current value of q
- 2. Subtract it from 100
- 3. Move the result back into q

```
mov ax,q  
mov bx,100  
sub bx,ax  
mov q,bx
```



Fundamental Data Types in Java

<u>Type Name</u>	<u>Kind of data</u>	<u>Memory used</u>	<u>Size range</u>
<code>int</code>	integers	4 bytes	-2,147,483,648 to 2,147,483,647
<code>double</code>	decimal #s	8 bytes	$\pm 1.76769 \times 10^{308}$ to $\pm 4.94 \times 10^{-324}$
<code>char</code>	single character	2 bytes	all characters
<code>boolean</code>	true or false	1 bit	true or false

ALL OTHER TYPES ARE CLASSES!!!



Your first Java class

<u>Class Name</u>	<u>Kind of data</u>	<u>Memory used</u>	<u>Size range</u>
String	words or phrases	varies	any word or phrase



Variables (cont'd)

- A variable must be declared before it can be used:

```
int count;
```

```
double x, y;
```

```
Type → JButton go;
```

```
Walker amy;
```

```
String firstName;
```

Name(s)

The name should be descriptive!!



Variables (cont'd)

- The assignment operator = sets the variable's value:

Examples

```
int numberOfStudents;
```

```
double myGPA = 4.15;
```

```
boolean studentAbsent = false;
```

```
String firstName;
```

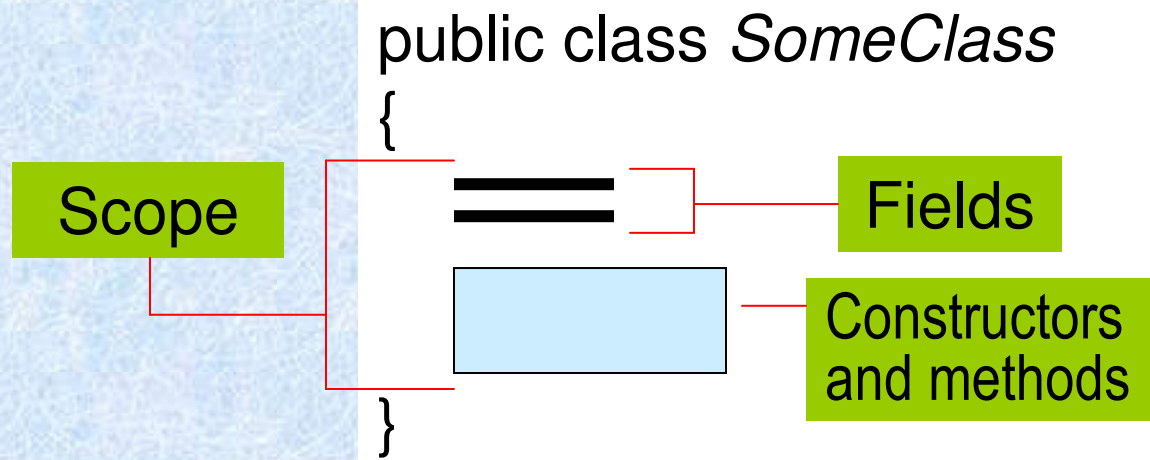
```
String phoneNumber = "707-433-5777";
```

Variables: Scope

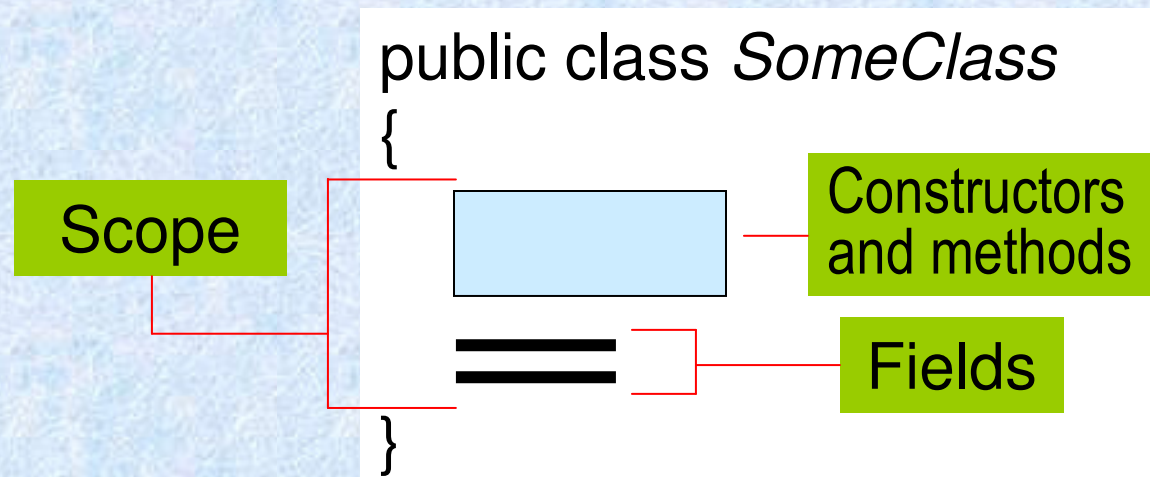
- Each variable has a scope — the area in the source code where it is “visible.”
- If you use a variable outside its scope, the compiler reports a syntax error.
- Variables can have the same name when their scopes do not overlap. ←

```
{  
    int k = ...;  
    ...  
}  
  
for (int k = ...)  
{  
    ...  
}
```

Variables: Fields



Or:



Variables: Local Variables

- Local variables are declared inside a constructor or a method.
- Local variables lose their values and are destroyed once the constructor or the method is exited.
- The scope of a local variable is from its declaration down to the closing brace of the block in which it is declared.



Variables: Local Variables

```
public class SomeClass
```

```
{
```

```
...
```

```
public SomeType SomeMethod (...)
```

```
{
```

```
    _____
```

Local variable declared

Scope

```
    _____  
    _____
```

```
    {
```

```
        _____  
        _____
```

Local variable declared

```
    }
```

```
}
```

```
...
```

```
}
```