

Memory Models

Part 1: Primitive data



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by Christine Alvarado, Mia Minnes, and Leo Porter, 2015.

By the end of this video you will be able to...

- Draw memory models for reasoning about variable values for primitive type data
- Update memory models to trace the state of the variables in Java code



Code tracing warm up

```
int var1;  
var1 = 52;  
int var2;  
var2 = var1;  
var1 = 127;  
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

```
int var1;
```



```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

Variable declaration: draw a box and label it with the variable's name

```
int var1;
```



Variable declaration: draw a box and label it with the variable's name

```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

var1

```
int var1;
```

```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

Variable assignment: put the value of the right hand side (RHS) into the box for the variable on the left hand side (LHS)

var1

```
int var1;
```

```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

Variable assignment: put the value of the right hand side (RHS) into the box for the variable on the left hand side (LHS)

var1

52

```
int var1;  
var1 = 52;  
int var2;  
var2 = var1;  
var1 = 127;  
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

Variable declaration: draw a box and label it with the variable's name

var1

52


```
int var1;  
var1 = 52;  
int var2;  
var2 = var1;  
var1 = 127;  
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

Variable declaration: draw a box and label it with the variable's name

var1 52 var2

```
int var1;
```

```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

Variable assignment: put the value of the right hand side (RHS) into the box for the variable on the left hand side (LHS)

var1

52

var2

```
int var1;
```

```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```


Variable assignment: put the value of the right hand side (RHS) into the box for the variable on the left hand side (LHS)

var1

52

var2

```
int var1;  
var1 = 52;  
int var2;  
var2 = var1;  
var1 = 127;
```



Variable assignment: put the value of the right hand side (RHS) into the box for the variable on the left hand side (LHS)

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```

var1

127

var2

52

```
int var1;
```

```
var1 = 52;
```

```
int var2;
```

```
var2 = var1;
```

```
var1 = 127;
```

var1 is 127, var2 is 52

```
System.out.println("var1 is " + var1 +  
                    ", var2 is " + var2);
```



var1

127

var2

52