Robert Frenken

4:10-5:05

HW 9: Tracing References

1.

Statement	Variable Values
	m -> 143 k -> 70
m.transferFrom(k);	
	m -> 70 k -> 0

2. Immutable types can't have a transferFrom method because once their values are set they cannot change, unlike with the transferFrom method.

3.

a.

Statement	Variable
private static void swap1(int i1, int i2) {	
	i1 = 7 i2 = 12
int tmp = i1;	
	i1 = 7 i2 = 12 tmp = 7
i1 = i2;	
	i1 = 12 i2 = 12 tmp = 7
i2 = tmp;	
	i1 = 12 i2 = 7 tmp = 7
}	

String x = 7, y = 12;	
	x = 7 y = 12
swap1(x, y);	
	x = 7 y = 12

b.

Statement	Variable
private static void swap2(String s1, String s2) {	
	s1 = “legends” s2 = “leaders”
String tmp = s1;	
	s1 = “legends” s2 = “leaders” tmp = “legends”
s1 = s2;	
	s1 = “leaders” s2 = “leaders” tmp = “legends”
s2 = tmp;	
	s1 = “legends” s2 = “legends” tmp = “legends”
}	
String x = "legends", y = "leaders";	
	x -> “legends” y -> “leaders”
swap2(x, y);	
	x -> “leaders” y -> “legends”

c.

Statement	Variable
private static void swap3(NaturalNumber n1, NaturalNumber n2) {	
	n1 -> 41 n2 -> 78
NaturalNumber tmp = n1;	
	n1 -> 41 n2 -> 78 tmp -> 41
n1 = n2;	
	n1 -> 78 n2 -> 78 tmp -> 41
n2 = tmp;	
	n1 -> 78 n2 -> 41 tmp -> 41
}	
NaturalNumber x = **new** NaturalNumber2(41), y = **new** NaturalNumber2(78);	
	x -> 41 y -> 78
swap3(x, y);	
	x -> 78 y -> 41