

Lab 17 Written Portion

All of the questions in this portion make use of the following class definition:

```
public class Foo {
    private int x; // instance variable

    // constructor
    public Foo(int y) {
        x = y; // set instance variable
    }

    // setter
    public void setX(int newX) {
        x = newX;
    }

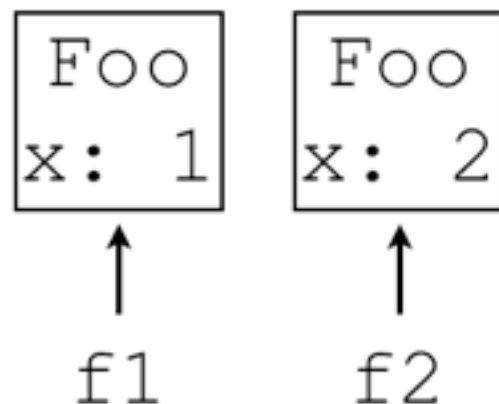
    public String toString() {
        return "" + x;
    }
}
```

Memory Representation

The following questions require you to write out how a snippet of code will “look” in memory after being executed. Some of them have already been done for you.

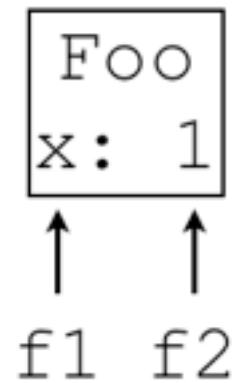
1.)

```
Foo f1 = new Foo(1);
Foo f2 = new Foo(2);
```



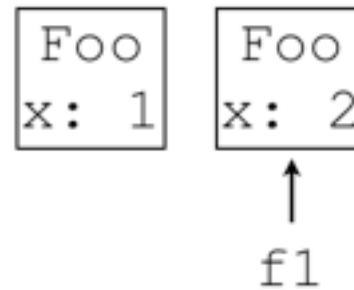
2.)

```
Foo f1 = new Foo(1);  
Foo f2 = f1;
```



3.)

```
Foo f1 = new Foo(1);  
f1 = new Foo(2);
```



4.)

```
Foo f1 = new Foo(1);  
Foo f2 = new Foo(2);  
Foo f3 = new Foo(3);
```

5.)

```
Foo f1 = new Foo(1);  
Foo f2 = new Foo(2);  
Foo f3 = f1;  
Foo f4 = f3;  
Foo f5 = f2;
```

6.)

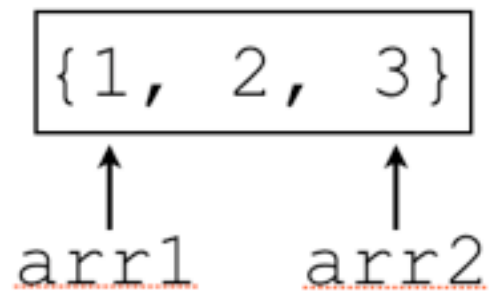
```
Foo f1 = new Foo(1);  
Foo f2 = new Foo(2);  
f1 = new Foo(3);
```

7.)

```
// Hint: new always  
// creates a new object  
Foo f1 = new Foo(1);  
Foo f2 = new Foo(1);  
Foo f3 = f2;
```

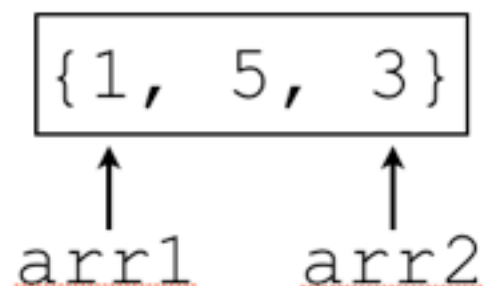
8.)

```
// Hint: arrays are objects  
int[] arr1 = new int[]{1, 2, 3};  
int[] arr2 = arr1;
```



9.)

```
int[] arr1 = new int[]{1, 2, 3};  
int[] arr2 = arr1;  
arr[1] = 5;
```



10.)

```
int[] arr1 = new int[]{1, 2};  
int[] arr2 = new int[]{1, 2};
```

11.)

```
int[] arr1 = new int[]{1, 2};  
arr1 = new int[]{1, 2};
```

12.)

```
int[] arr1 = new int[]{1, 2};  
int[] arr2 = arr1;  
int[] arr3 = arr2;  
arr3[0] = 7;
```

13.)

```
Foo f1 = new Foo(1);  
Foo f2 = new Foo(2);  
Foo f3 = f1;  
f3.setX(8);
```

Code Output

The following questions ask you what the output of a snippet of code is, starting execution from main. The first one has been done for you as an example.

14.)

```
public static void method1(int x) {
    // empty method
}

public static void main(String[] args) {
    int x = 7;
    System.out.println(x);
    method1(x);
    System.out.println(x);
}
```

OUTPUT:

7
7

15.)

```
public static void method2(int x) {
    x = 14;
}

public static void main(String[] args) {
    int x = 7;
    System.out.println(x);
    method2(x);
    System.out.println(x);
}
```

OUTPUT:

16.)

```
public static void method3(Foo x) {  
    // empty method  
}  
  
public static void main(String[] args) {  
    Foo x = new Foo(7);  
    System.out.println(x);  
    method3(x);  
    System.out.println(x);  
}
```

OUTPUT:

7
7

17.)

```
public static void method4(Foo x) {  
    x = new Foo(8);  
}  
  
public static void main(String[] args) {  
    Foo x = new Foo(7);  
    System.out.println(x);  
    method4(x);  
    System.out.println(x);  
}
```

OUTPUT:

17.)

```
public static void method5(Foo x) {
    x.setX(8)
}

public static void main(String[] args) {
    Foo x = new Foo(7);
    System.out.println(x);
    method5(x);
    System.out.println(x);
}
```

OUTPUT:

18.)

```
public static void method6(Foo x) {
    x = new Foo(8);
    x.setX(9)
}

public static void main(String[] args) {
    Foo x = new Foo(7);
    System.out.println(x);
    method6(x);
    System.out.println(x);
}
```

OUTPUT:

19.)

```
public static void method7(Foo x) {
    x.setX(9)
    x = new Foo(8);
}

public static void main(String[] args) {
    Foo x = new Foo(7);
    System.out.println(x);
    method7(x);
    System.out.println(x);
}
```

OUTPUT:

20.)

```
public static void method8(Foo x) {
    if (x != null) {
        System.out.println(x);
    } else {
        System.out.println("x is null");
    }
}

public static void main(String[] args) {
    Foo x = new Foo(7);
    System.out.println(x);
    method8(x);
    System.out.println(x);
}
```

OUTPUT: