Problem Set 2, Part I

Problem 1: Variable scope
1)a,b
2)a,b,i
3)a,b,i,c,j
4)a,b,i
5)x
6)x,y

Problem 2: String objects and their methods
2-1
a) str2.substring(0, 5) + str1.substring(5)
b) str2.substring(1, 2) + str1.substring(10)
c) str1.toLowerCase().substring(0, 6) +
str2.toUpperCase().substring(6)
d) str1.charAt(4)
e) str2.charAt(2) + str1.substring(str1.length()-1)
f) str1.indexOf('g')
g) str1.replace('i', 'o')

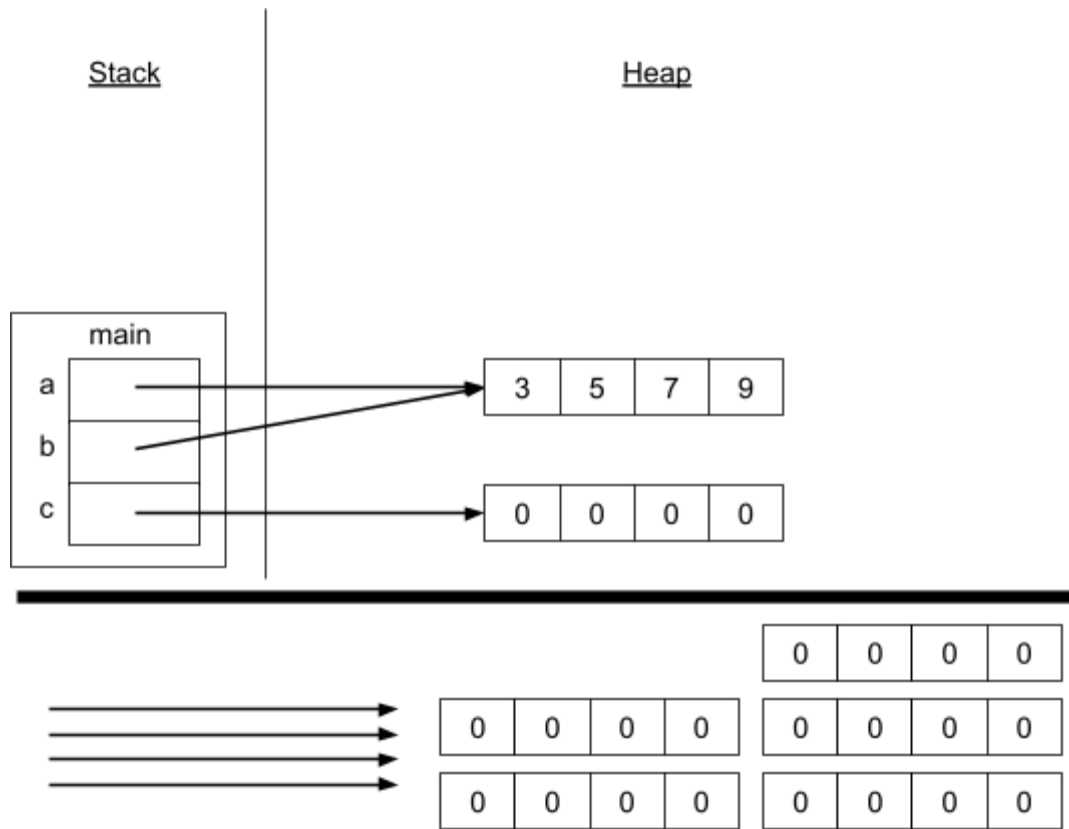**Problem 3: Understanding code that uses an array**
3-1)

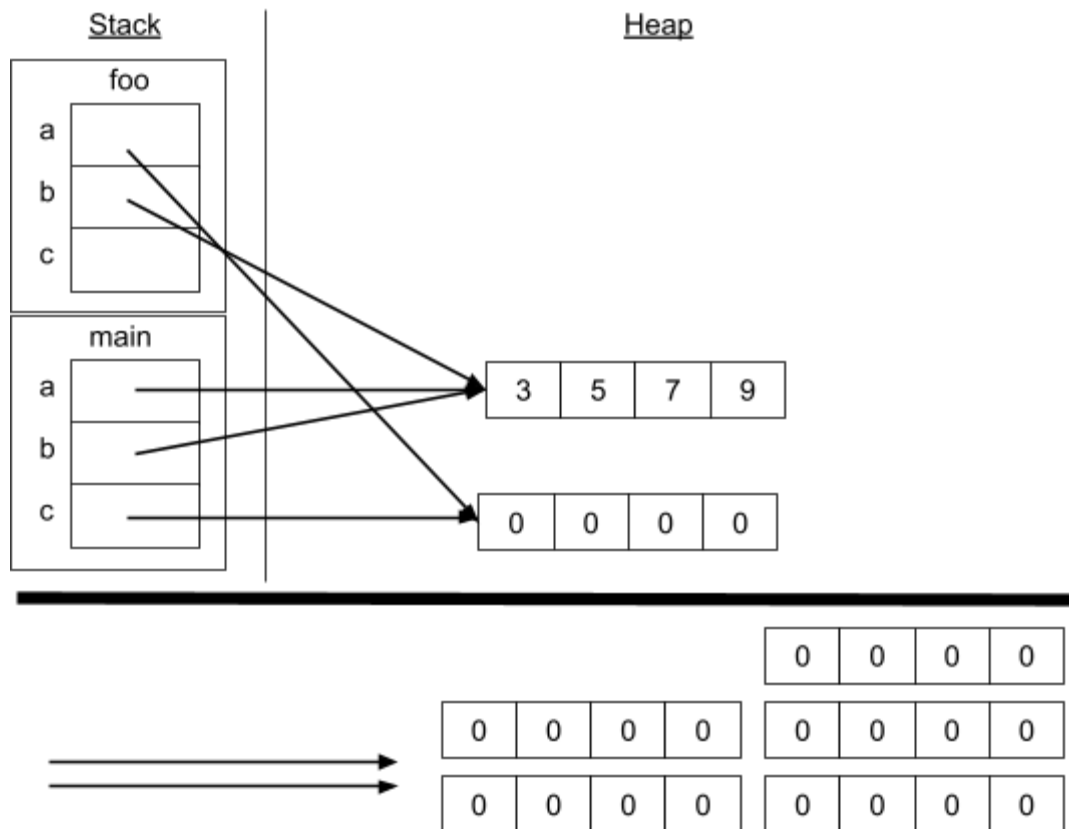| i	val1	val2	arr
-	-	-	{1, 3, 5, 7, 9, 11, 13}
0	3	5	{8, 3, 5, 7, 9, 11, 13}
1	5	7	{8, 12, 5, 7, 9, 11, 13}
2	7	9	{8, 12, 16, 7, 9, 11, 13}
3	9	11	{8, 12, 16, 20, 9, 11, 13}
4	11	13	{8, 12, 16, 20, 24, 11, 13}
5			

3-2)

We see the changes made by the mystery() method. This makes sense because the function changes the number and replaces it in the given index of the array.
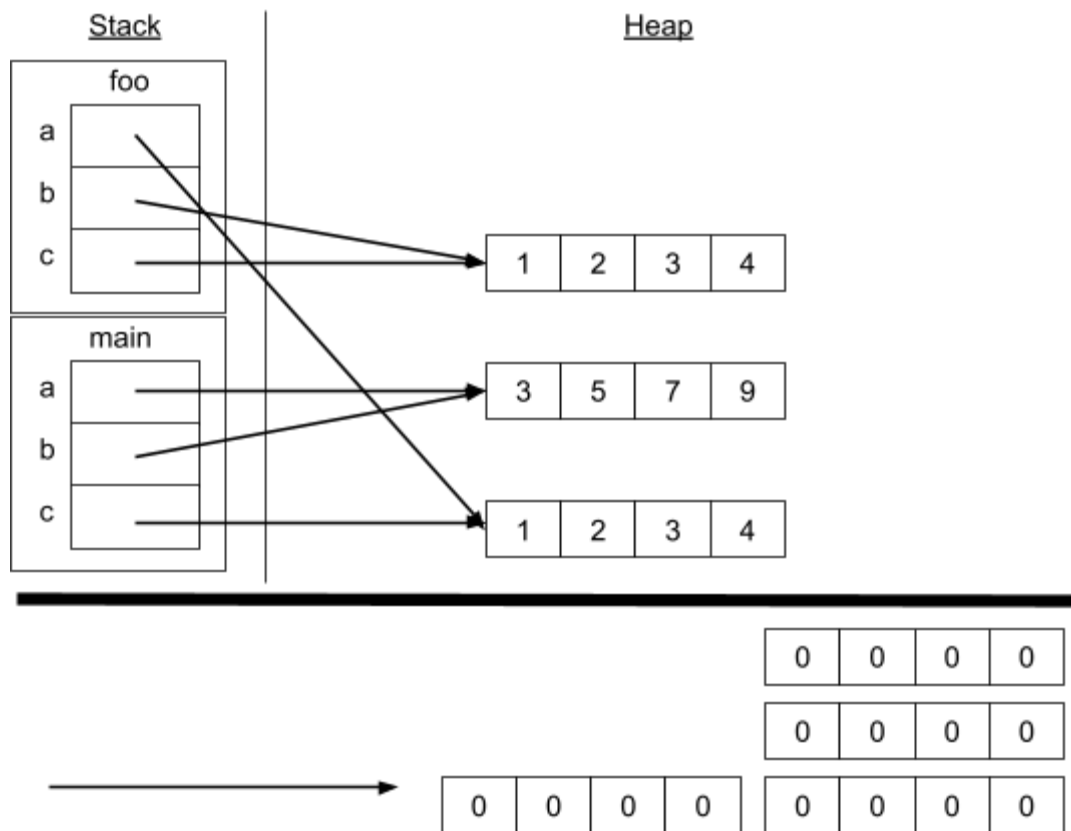
Problem 4: Memory management and arrays

4-1)

Stack   Heap

main

a

b

c

3	5	7	9

0	0	0	0

0	0	0	0

0	0	0	0

0	0	0	0

0	0	0	0

0	0	0	0

4-2)

Stack   Heap

foo

a

b

c

main

a

b

c

3	5	7	9

0	0	0	0

0	0	0	0

0	0	0	0

0	0	0	0

0	0	0	0

0	0	0	0

4-3)

Stack

Heap

foo

a

b

c

main

a

b

c

| 1 | 2 | 3 | 4 |

| 3 | 5 | 7 | 9 |

| 1 | 2 | 3 | 4 |

| 0 | 0 | 0 | 0 |

| 0 | 0 | 0 | 0 |

| 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |

4-4)

Stack

Heap

foo

a

b

c

main

a

b

c

| 3 | 5 | 7 | 9 |

| 1 | 2 | 3 | 4 |

| 0 | 0 | 0 | 0 |

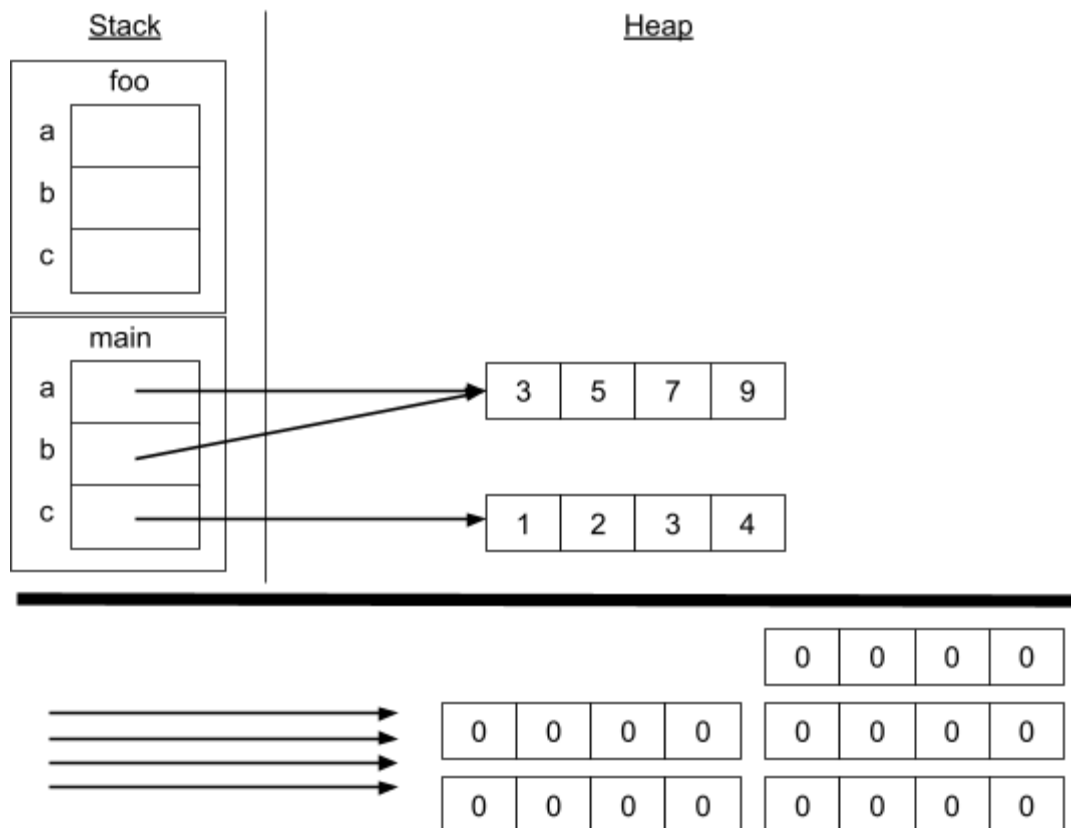| 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |

| 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |

Problem 5: Two-dimensional arrays

5-1) twoD[1][2] = 14;

5-2) for (int i = 0; i < twoD.length; i++) {
    System.out.println(twoD[i][0]);
  }

5-3) for (int i = 0; i < twoD.length; i++) {
    System.out.println(twoD[twoD.length - 1 - i][i])
  }