

## Review: "While" Loops & "For" Loops



Identify the output of the following "while" loops

1. 

```
int num = 2;
while (num < 10)
{
    System.out.print (num + "");
    num++;
}
```

23456789

2. 

```
double num = 13.5;
while (num >= 8)
{
    System.out.print (num + " ");
    num--;
}
```

13.5 12.5 11.5 10.5 9.5 8.5

3. 

```
double num = 16;
while (num > 8)
{
    if (num % 2 == 0)
    {
        num -= 1;
    }
    System.out.print (num);
}
```

num % 2 == 0?  
16 ✓  
15 No  
15 No  
15  
⋮  
✓

infinite loop, no output!

Identify the output of the following "for" loops

4. 

```
for (int value=7; value > 0; value--)
    {System.out.print (value);}
```

7654321

5. 

```
for (int value=1; value >= 20; value+=4)
    System.out.print (value);
```

Nothing prints!

6. 

```
for (int value=4; value < 24; value++)
    if (value%4 != 0)
        System.out.println (value);
```

leaves out multiples of 4  
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

5 6 7 9 10 11 13 14 15 17 18 19 21 22 23

↓ on separate line

## Identifying Outputs of "Nested" Loops

Show the output produced by the following segments of code. Assume that all variables are declared as int.

```

7. for (int k = 1; k <= 2; k++)
    for (int m = 1; m <= 3; m++)
        System.out.println(k + " " + m);
    
```

*change to print!*

k	m	output
1	1	1 1
1	2	1 1 2
1	3	1 1 2 1 3
2	1	1 1 2 1 3 2 1
2	2	1 1 2 1 3 2 1 2 2
2	3	1 1 2 1 3 2 1 2 2 3
3	stop!	

```

8. for (int d = 6; d >= 4; d--)
    for (int e = 2; e <= 4; e++)
        System.out.println(d + " " + e);
    
```

d	e	output
6	2	6 2
6	3	6 2 6 3
6	4	6 2 6 3 6 4
5	2	6 2 6 3 6 4 5 2
5	3	
5	4	
4	2	6 2 6 3 6 4 5 2 5 3 5 4 4 2
4	3	
4	4	(6 2 6 3 6 4 5 2 5 3 5 4 4 2 4 3 4 4)

skip

```

9. int x = 1;
    while (x <= 5)
    {
        sum = 0;
        y = 1;
        while (y <= x)
        {
            sum += 2;
            y++;
        }
        System.out.print(sum + " ");
        x++;
    }
    
```

i	j	println
1	1	1
1	1	1
1	stop	
2	2	2
2	2	2
2	stop	
3	3	3
3	3	3
3	1	1
3	stop	
4	4	4
4	4	4
4	2	2
4	stop	
5	5	5
5	5	5
5	3	3
5	1	1

**CHALLENGE:**

skip

```

11. for (i = 1; i <= 3; i++)
    for (j = 1; j <= 3; j++)
    {
        for (k = i; k <= j; k++)
            System.out.println(i + j + k);
        System.out.println();
    }
    
```

i	j	println
1	1	1
1	1	1
1	stop	
4	4	4
4	4	4
4	2	2
4	stop	
5	5	5
5	5	5
5	3	3
5	1	1