

AP CS: Lesson 10: Advanced if/else & Cumulative Algorithms

Name: _____ Period: _____

Java Syntax:

Returning Different values based on if/else:

```
// Returns the larger of the two given integers.
public static int max(int a, int b) {
    if (a > b) {
        return a;
    } else {
        return b;
    }
}
```

More Logic: AND, OR, & NOT

Operator	Meaning	Example	Value
&&	AND	(2 == 3) && (-1 < 5)	false
	OR	(2 == 3) (-1 < 5)	true
!	NOT	!(2 == 3)	true

Practice time: What is the result of each of the following expressions?

```
int x = 42;
```

```
int y = 17;
```

```
int z = 25;
```

A: `y < x && y <= z`

B: `x % 2 == y % 2 || x % 2 == z % 2`

C: `x <= y + z && x >= y + z`

D: `!(x < y && x < z)`

E: `(x + y) % 2 == 0 || !((z - y) % 2 == 0)`

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Factoring: Extracting common/redundant code

Cumulative Algorithms:

cumulative sum: A variable that keeps a sum in progress and is updated repeatedly until summing is finished. For example:

```
int sum = 0;
for (int i = 1; i <= 1000; i++) {
    sum = sum + i;
}
System.out.println("The sum is " + sum)
```

- The **sum** in the above code is an attempt at a cumulative sum.
- Cumulative sum variables must be declared *outside* the loops that update them, so that they will still exist after the loop.
- And this cumulative idea can be used with other operators, like multiplication

(product):

```
int product = 1;
for (int i = 1; i <= 20; i++) {
    product = product * 2;
}
System.out.println("2 ^ 20 = " + product)
```

Class Notes:

Exit Ticket - Please answer and return at end of period. Thanks.

1. I understand how to return a value from a method: Yes Somewhat No

2. I understand how to use an if/else conditional: Yes Somewhat No

3. I understand how to use AND, OR & NOT: Yes Somewhat No

4. I understand how to use to create a cumulative sum: Yes Somewhat No

Additional comments, especially if you answered "No" to any of the above what would you like to more details on? Thanks
