

Lesson 23: Iterative Algorithms #3 (W07D2)

Balboa High School

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Do Now

What does this algorithm do? Make a table **on paper**, like you'll have to on the next quiz.

```
int i = 1, j = 0, total = 0;

while ( i <= 5 ) {

    if ( j == 0 ) { // '==' is a test for 'equals'
        total += i;
        j++;
    } else {
        total -= i;
        j--;
    }

    i++;
}

System.out.println("total is " + total);
```

Students will practice writing and interpreting iterative functions.

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- If a loop is needed. . .
 - **first:** figure out the code inside the loop
 - what variables from outside the block are needed?
 - **last:** figure out the stopping condition — how do you stop the looping?

Now the Really Good Tips

- Once you write a solution to your problem, don't let hubris be your undoing!¹ Pretend your code is someone else's. As such, don't make assumptions about it and don't trust that it works! Trace how it runs, **carefully** tracking variable state (in a table!).

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- Errors commonly involve *off-by-one* mistakes, where you have a condition that causes a loop to stop too soon or too late. For example, using

```
while ( a < 10 )
```

instead of

```
while ( a <= 10 )
```

would be one such mistake.

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What to do next. . .

- With one or two other classmates, work on PS #4a, §3.5 – *sketching out solutions on paper*. Everyone must participate!
→ See [here](#).
- Once you have an answer you like for a question, move on to the next. Try coding the solutions in Java **later** in the period if you have time.

Finish §3.5 of PS #4a.