Northern Michigan University (Marquette Co, MI)

CS444-01-25F: Parallel & Distributed Processing (Andrew A. Poe) Name: _____
Quiz 3 Wednesday 17 September 2025 9:00 A.M. EDT

Consider this pseudo-code:

```
int x=0, y=10;
co {
 while (x !=y) x= x+1
 %%
 while (x !=y) y = y-1
}
```

Does this program satisfy the At-Most-Once property? Why or why not?

YES!

The x+1 contains no variable modified by a different thread. So, the x is allowed to be read by another thread (which it is). Similarly the y-1 contains no variable modified by a different thread so the y is allowed to be read by another thread (which it is).

So ,no problem!!

Is this program guaranteed to terminate? Why or why not?

NO!

Imagine that the first thread takes x up to 9 before the second thread does anything.

THEN...

Thread 1 Thread 2
while (x != y)
while (x != y) //both are true
x = x+1
y = y-1 //x is 10 and y is 9

At this point, the loops will not terminate since x keeps getting larger and y keeps getting smaller.