

Complete the trace tables for the following codes

In all exercises below index position 1 is the first index position eg in list $a = [3, 4, 5, 6]$, the value 3 is in position 1.

```

a ← 2
b ← 3
c ← a + b
a ← c
a ← a * 2
a ← a + 13
d ← a << 1
e ← d MOD 3
OUTPUT e
  
```

a	b	c	d	e	Output
2	3	5			
5					
10					
23			56	2	2

```

a ← 12
IF a < 10 THEN
  b ← 10 * a
ELSE
  b ← 2 * a
ENDIF

IF b > 30 THEN
  b ← 30
ELSE
  b ← 10
ENDIF

OUTPUT b
  
```

a	b	Output
12		
	24	
	10	
		10

```

num1 ← 3
num2 ← 4
FOR i ← 1 TO 4
  num1 ← num1 + num2
  num2 ← num1 // 2
ENDFOR
OUTPUT num1
  
```

num1	num2	i	Output
3	4	1	
7	3	2	
10	5	3	
15	7	4	
22	11		22

```

x ← 10
y ← 2
WHILE x >= 2
  x ← x - y
  y ← y + 1
ENDWHILE
  
```

x	y
10	2
8	3
5	4

```

x ← 12
y ← x
WHILE y > 1
  y ← y - 1
  if x MOD y == 0
    OUTPUT y
  ENDWHILE

```

x	y	OUTPUT
6	6	
	5	
	4	
	3	3
	2	2

```

FOR i ← 1 TO 3
  FOR j ← 2 TO 3
    a ← i * j + 2
  ENDFOR
ENDFOR

```

i	j	a
1	2	4
2	2	6
3	2	8
1	3	5
2	3	8
3	3	11

```

x ← 0
y ← 0
z ← 0
w ← USERINPUT
WHILE w >= 0
  x ← x + w
  y ← y + 1
  w ← USERINPUT
ENDWHILE
z ← x // y
OUTPUT z

```

w	x	y	z	Output
3	0	0	0	
	3	1		
4	7	2		
-1				3

Use input for w: 3, 4, -1

What happens if you enter the sequence -1, 2, 3, 6, 7?

$z = 0 // 0$ which would result in zero division error

What happens if you enter the sequence 0, -1?

$z = 0 / 1$ which would be 0

```

a=[[0,1,2],[3,4,3]]
c=[0,0,0]
FOR i ← 1 TO 3
  c[i] ← a[1][i] + a[2][i]
ENDFOR

```

i	C[i]	a[1][i]	A[2][i]
1	3	0	3
2	5	1	4
3	5	2	3