

Exam 1 – Paper and Pencil – In-class Practice

Name: SOLUTION Section: _____

1. Consider the code snippet below. It is a contrived example with poor style, but it will run without errors. What does it print when it runs? Write your answer in the box to the right of the code. Show your work by making notations in the code or by using the empty space below or on another sheet of paper, as desired.

```

def main():
    a = 3
    b = 1
    400 a = two(a, b)
    print("Main:", a, b)

def two(x, a):
    print("Two 1:", x, a)
    z = one(one(x + 1, 10), 2)
    print("Two 2:", z)
    return z + 5
    z = z + 20
    return z

def one(b, a):
    print("One 1:", a, b)
    b = b * 10
    print("One 2:", a, b)
    return b + 5

print("Bottom:", one(1, 2))
main()

```

Handwritten annotations in red:

- Next to `a = 3`: ³
- Next to `b = 1`: ¹
- Next to `a = two(a, b)`: ⁴⁰⁰
- Next to `print("Two 1:", x, a)`: ^{3 1}
- Next to `z = one(one(x + 1, 10), 2)`: ⁴
- Next to `print("Two 2:", z)`: ⁴⁵
- Next to `return z + 5`: ^{50 460}
- Next to `z = z + 20`: ²⁰
- Next to `return z`: ⁴⁰
- Next to `print("One 1:", a, b)`: ^{2 45}
- Next to `b = b * 10`: ^{40 450}
- Next to `print("One 2:", a, b)`: ^{2 450}
- Next to `return b + 5`: ^{45 455}

Output:

ONE 1: 2 1
 ONE 2: 2 10
 Bottom: 15
 Two 1: 3 1
 ONE 1: 10 4
 ONE 2: 10 40
 ONE 1: 2 45
 ONE 2: 2 450
 Two 2: 455
 MAIN: 460 1

2. Consider the code below. It is a contrived example with poor style but will run without errors. In this problem, you will trace the execution of the code. As each Location is encountered during the run:

1. **CIRCLE** each name (i.e., variable) that is *defined* at that Location.
2. **WRITE** the **VALUE** of each name (i.e., variable) that you *circled* directly **BELOW** the circle.

Note that you fill in the table in the order that Locations are encountered, NOT from top to bottom. Ask for help if you do not understand these instructions.

<pre>def main(): ##### Location 1 a = 1 b = 2 c = 3 d = 4 e = 5 ##### Location 2 4 a = boo(d, b, c, a) ##### Location 3 4 2 3 1 def boo(a, b, c, d): ##### Location 4 b = 10 r = a + 10 14 ##### Location 5 return a 4 ##### Location 6 main() ##### Location 7</pre>	Location 1	a	b	c	d	e	r
	Location 2	a	b	c	d	e	r
	Location 3	a	b	c	d	e	r
	Location 4	a	b	c	d	e	r
	Location 5	a	b	c	d	e	r
	Location 6	a	b	c	d	e	r
	Location 7	a	b	c	d	e	r