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Programming and Data Structures with Python

Quiz 1, I Semester, 2025–2026

18 September, 2025

The first three questions refer to the following Python program.

```
def f(l):
    l.extend(l[1:])
    return(l)
```

```
def g(l):
    l = l + l[1:]
    return(l)
```

```
list1 = [7,3,9]
list2 = f(list1)
list3 = g(list2)
```

1. What is the value of `list1` at the end of this program?

Answer: `[7,3,9,3,9]`

The call `list2 = f(list1)` indirectly updates `list1` from `[7,3,9]` to `[7,3,9,3,9]`.

2. What is the value of `list2` at the end of this program?

Answer: `[7,3,9,3,9]`

The call `list2 = f(list1)` sets `list2` to `[7,3,9,3,9]`. The call `list3 = g(list2)` has no effect on `list2` because `l` is reassigned within `g()`.

3. What is the value of `list3` at the end of this program?

Answer: `[7,3,9,3,9,3,9,3,9]`

The call `list3 = f(list2)` sets `list3` to `[7,3,9,3,9] + [3,9,3,9]`.

The next three questions refer to the following python program.

```
def f():
    global l1,x1
    l1 = l1 + [6]
    l2.append(7)
    l3 = l1 + [8]
    x1 = x1 + 9
    x2 = x1 + 10
```

```
(l1,l2,l3) = ([1],[2],[3])
(x1,x2) = (4,5)
f()
```

4. What is the value of `l1+l2` at the end of this program?

Answer: `[1,6,2,7]`

`l1` is declared `global` so updates within `f()` refer to the value outside `f()`. Since `l2` is not defined within `f()`, the update refers to the global `l2` in the outer context.

5. What is the value of `l1+l3` at the end of this program?

Answer: `[1,6,3]`

Since `l3` is reassigned in `f()`, it becomes a local copy and the update does not propagate to the global `l3`.

6. What is the value of `x1+x2` at the end of this program?

Answer: 18

Only `x1` is globally updated in `f`. The name `x2` in `f()` is a local copy. The final answer is $(4+9)+5 = 18$.
