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Programming and Data Structures with Python

Quiz 2, 10 September 2026, I Semester, 2026–2027

Note: There were two question groups, with four variants of each. There were multiple question papers with different combinations of variants.

1. What is the value of `pairs` after the following assignment?

```
pairs = [ (x,y) for x in range(4,0,-1) for y in range(x-1,0,-1) if (x+y)%3 != 0 ]
```

Answer: [(4,3),(4,1),(3,2),(3,1)]

2. What is the value of `pairs` after the following assignment?

```
pairs = [ (x,y) for x in range(1,5) for y in range(x,4) if (x+y)%2 == 0 ]
```

Answer: [(1,1),(1,3),(2,2),(3,3)]

3. What is the value of `pairs` after the following assignment?

```
pairs = [ (x,y) for x in range(1,4) for y in range(x) if (x+y)%3 != 0 ]
```

Answer: [(1,0),(2,0),(3,1),(3,2)]

4. What is the value of `pairs` after the following assignment?

```
pairs = [ (x,y) for x in range(4) for y in range(x,4) if (x+y)%3 == 0 ]
```

Answer: [(0,0),(0,3),(1,2),(3,3)]

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()
```

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

Answer: [1,6,2,7]

Since `l1` is declared `global`, it gets updated to `[1,6]`. Mutable values are implicitly global, so `l2.append(7)` updates `l2` in place to `[2,7]`.

6. What is the value of `13+12` at the end of this program?

Answer: `[3,2,7]`

Mutable values are implicitly global, so `12.append(7)` updates `12` in place to `[2,7]`. The update to `13` is local to `f()` since `13` is reassigned and not declared `global`.

7. 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`.

The next three questions refer to the following Python program.

```
def g():
    global 12,x2
    11.extend([8])
    12 = 12 + [9]
    13 = 12 + [10]
    x1 = x2 + 3
    x2 = x2 + 4

(11,12,13) = ([6],[7],[11])
(x1,x2) = (5,8)
g()
```

8. What is the value of `11+12` at the end of this program?

Answer: `[6,8,7,9]`

Mutable values are implicitly global so `11` is updated to `[6,8]` in `g()`, while `12` is updated to `[7,9]` because of the `global` declaration.

9. What is the value of `13+12` at the end of this program?

Answer: `[11,7,9]`

The update to `13` in `g()` is local, so `13` remains `[11]`, while `12` is updated to `[7,9]` because of the `global` declaration.

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

Answer: `17`

Only `x2` is globally updated in `g()`. The name `x1` in `g()` is a local copy. The final answer is `5+(8+4) 17`.

The next three questions refer to the following Python program.

```
def f():
    global 13,x2
    11 = 13 + [47]
    12.append(80)
    13 = 13 + [93]
    x1 = x2 + 11
    x2 = x2 + 42

(11,12,13) = ([37],[28],[19])
(x1,x2) = (50,31)
f()
```

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

Answer: `[37,19,93]`

The update to `l1` in `f()` is local, so `l1` remains `[37]`, while `l3` is updated to `[19,93]` because of the `global` declaration.

12. What is the value of `l2+l3` at the end of this program?

Answer: `[28,80,19,93]`

Mutable values are implicitly global, so `l2` is updated to `[28,80]`, while `l3` is updated to `[19,93]` because of the `global` declaration.

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

Answer: `123`

Only `x2` is globally updated in `f`. The name `x1` in `f()` is a local copy. The final answer is `50+(31+42) == 123`.

The next three questions refer to the following Python program.

```
def g():
    global l3,x1
    l1.extend([75])
    l2 = l3 + [85]
    l3 = l3 + [103]
    x1 = x1 + 12
    x2 = x1 + 25

(l1,l2,l3) = ([65],[86],[95])
(x1,x2) = (37,14)
g()
```

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

Answer: `[65,75,95,103]`

Mutable values are implicitly global so `l1` is updated to `[65,75]` in `g()`, while `l3` is updated to `[95,103]` because of the `global` declaration.

15. What is the value of `l2+l3` at the end of this program?

Answer: `[86,95,103]`

The update to `l2` in `g()` is local, so `l2` remains `[86]`, while `l3` is updated to `[95,103]` because of the `global` declaration.

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

Answer: `63`

Only `x1` is globally updated in `f`. The name `x2` in `g()` is a local copy. The final answer is `(37+12)+14 == 63`.