Quiz: Functions (Practice Problems)

Note 1. The format of this quiz will be the same as the previous quiz (4 problems, each worth 1 point). 1 of these problems will be taken from the material from topic 0, and the other 3 problems will be on functions following the problems below.

1 Functional Programming

Note 2. I will generate new problems from the problems below by: (1) changing the expressions in the lambda functions, (2) changing the values in the range function.

Problem 1. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
def foo(x):
    return x+1
xs = [1, 2, 3]
xs = [foo(x) for x in xs]
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 2. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
def foo(x):
    return x+1
xs = [1, 2, 3]
xs = map(foo, xs)
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 3. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = range(3, 5)
xs = map(lambda x: x+1, xs)
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 4. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
foo = lambda x: x*2
xs = range(5, 1, -2)
xs = map(foo, xs)
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 5. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
foo = lambda x: x < 5
xs = range(10)
xs = [x for x in xs if foo(x)]
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 6. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
foo = lambda x: x < 5
xs = range(10)
xs = filter(foo, xs)
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 7. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = range(10)
xs = [x*2 for x in xs if x<5]
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 8. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = range(10)
xs = map(lambda x: x*2, xs)
xs = filter(lambda x: x<5, xs)
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 9. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = range(10)
xs = filter(lambda x: x<5, xs)
xs = map(lambda x: x*2, xs)
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 10. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = map(lambda x: x*2, filter(lambda x: x<5, range(10)))
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

Problem 11. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = filter(lambda x: x<5, map(lambda x: x*2, range(10)))
xs = list(xs)
print("xs=", xs)
EOF
$ python3 foo.py
```

2 Scope

Note 3. I will generate new problems from the problems below by: (1) adding/removing the global keyword, (2) changing constants in the python code, or (3) re-ordering or duplicating lines.

Problem 12. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
x = 1
def foo(x):
    return x + 1
x = 2
print('foo(3)=', foo(3))
EOF
$ python3 foo.py
```

Problem 13. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
x = 1
def foo(y):
    x = 3
    return y + x
print('foo(3)=', foo(3))
EOF
$ python3 foo.py
```

Problem 14. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
x = 1
def foo(y):
    x = 3
    return y + x
foo(5)
print('x=', x)
EOF
$ python3 foo.py
```

Problem 15. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
x = 1
def foo(x):
    return x + 1
foo(5)
print('x=', x)
EOF
$ python3 foo.py
```

Problem 16. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
x = 1
def foo(y):
    global x
    x = y
foo(5)
print('x=', x)
EOF
$ python3 foo.py
```

Problem 17. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = [1, 2, 3]
def foo(y):
    xs.append(y)
foo(5)
print('sum(xs)=',sum(xs))
EOF
$ python3 foo.py
```

Problem 18. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = [1, 2, 3]
def foo(y):
    xs = [y, y, y]
    return y
foo(5)
print('sum(xs)=',sum(xs))
EOF
$ python3 foo.py
```

Problem 19. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = [1, 2, 3]
def foo(y):
    global xs
    xs = [y, y, y]
    return y
foo(5)
print('sum(xs)=',sum(xs))
EOF
$ python3 foo.py
```

Problem 20. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = [1, 2, 3]
def foo():
    xs.pop()
def bar():
    global xs
    xs = [4, 5, 6]
    xs.append(7)
foo()
bar()
foo()
bar()
foo()
foo()
print('sum(xs)=',sum(xs))
EOF
$ python3 foo.py
```

Problem 21. Write the output of the final command in the following terminal session. If the command has no output, then leave the problem blank.

```
$ cd
$ rm -rf quiz
$ mkdir quiz
$ cd quiz
$ cat > foo.py <<EOF
xs = [1, 2, 3]
def foo():
    global xs
    xs.pop()
def bar():
    global xs
    xs = [4, 5, 6]
    xs.append(7)
foo()
bar()
foo()
bar()
foo()
foo()
print('sum(xs)=',sum(xs))
EOF
$ python3 foo.py
```