This quiz has 3 questions, for a total of 10 points.

1. **3 points** Suppose that \( L \) is a Python “list” (array) of length \( n \). Categorize the worst-case execution time of each of the below operations as either

   1. constant time (takes the same amount of time no matter what \( n \) is).
   2. logarithmic time (takes time proportional to \( \log n \)).
   3. linear time (takes time proportional to \( n \))
   4. quadratic (takes time proportional to \( n^2 \))

Label each operation with the above item number.

- (1) \((1,5) \text{ in } L\)
- (1) \(L[len(L)-1]\)
- (3) \(L.remove(0)\)

**Solution:**

- (3), \((1,5) \text{ in } L\) is linear time, (1 point)
- (1), \(L[len(L)-1]\) is constant time, (1 point)
- (3), \(L.remove(0)\) is linear time, (1 point)

2. **3 points** What is the output of the following Python program?

```python
D = {(0,0): 'blue', (1,0): 'red', (0,1): 'green', }
predrint((1,1) in D)
predrint(D[(0,1)])
D[(0,1)] = 'yellow'
predrint(D[(0,1)])
```

**Solution:**

```
False
green
yellow
```

Grading rubric: The key \((1,1)\) is not in \( D \) (1 point). Looking up the key \((0,1)\) in \( D \) returns the associated string green (1 point). The Finally, the value for \((0,1)\) is overwritten with yellow, so that’s the last output (1 point).
3. **4 points** Complete the following implementation of the `erase_front` method. The method should remove the node at the front of the list, if there is one.

```python
class Node:
    def __init__(self, data, next):
        self.data = data
        ___(a)___

class List:
    def __init__(self):
        self.head = None
        self.tail = None

    def erase_front(self):
        if ___(b)___:
            if self.tail == self.head:
                ___(c)___
                self.head = ___(d)___

Solution:

(a) self.next = next (1 point)
(b) self.head != None (1 point)
(c) self.tail = None (1 point)
(d) self.head.next (1 point)