Microquiz 1

1.

- create_1 and create_2 have the same time complexity
- → For all values of L and n, the expression 0 if create_1(L, n) == create_2(L, n) else 1 evaluates to 0
- → It is possible to write code that can detect whether a list was created using create_1 or create_2
- None of the above.

2.

- → A brute force solution to the 0/1 knapsack problem will always produce an optimal solution.
- The complexity of the 0/1 knapsack problem (the kind of knapsack problem described in lecture) is O(2**n) where n = number_of_items * maximum_weight_allowed.
- None of the above.

3.

- Dynamic programming can be used to reduce the asymptotic time complexity of some inherently exponential problems to polynomial time.
- Dynamic programming can be productively applied to the problem of sorting a list of integers.
- Dynamic programming is useful only when the constraint of an optimization problem can be checked in linear time.
- → None of the above.

4.

```
def fact_table(L):
    d_memo = {1:1}
    for i in range(2, max(L)+1):
        d_memo[i] = d_memo[i-1]*i
    result = {}
    for e in L:
        result[e] = d_memo[e]
    return result
```