Microquiz 2

1.

Consider a complete (undirected, unweighted) graph, G, with n nodes. Choose all that apply:

- → G has O(n**2) edges
- → On average, the time required by breadth-first-search to find the shortest path between a pair of nodes in G, will be less than linear in the number of edges in G.
- On average, breadth-first search and depth-first search will take the same amount of time to find the shortest path.
- None of the above.

2.

John had 2 coins. One coin was fair, with the probability of heads and tails being 1/2 each. The other coin was biased, with the probability of heads 3/4 and tails 1/4. He tosses each coin 2 times. What is the probability that all four tosses come up heads?

9/64

3.

A daily lottery sells 10 tickets, of which one is the winner. On day 1, John enters the lottery by buying one ticket. If he doesn't win, he enters again on day 2. Day 2 he doubles the number of tickets he buys to two. If he doesn’t win again, he enters on day 3. Day 3 he doubles again the number of tickets to four. What is the probability that John wins the lottery within 3 days?

0.568

4.

```
def quiz_average(trials, low, high):
    s = 0
    for t in range(trials):
        r1 = random.gauss(70, 10)
        r2 = random.gauss(80, 12)
        r3 = random.randint(low, high)
        if 70 <= (r1+r2+r3)/3  <= 75:
            s += 1
    return s/trials
```