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Question 1

Algorithm	Time Complexity	Space Complexity	Complete?	Optimal?
BFS	O(b^(d + 1))	O(b^(d + 1))	Yes for a uniform cost	Yes
UCS	O(b^(1 + C/M))	O(b ^d)	Yes	Yes
DFS	O(b^d)	O(bd)	Yes on a finite graph	No
DLS	O(b^L)	O(b^L)	No	No
IDS	O(b^d)	O(bd)	Yes	Yes
A*	O(bd)	O(bd)	Yes	Yes

B = branching factor, d = depth, L = limit, C = cost

Question 2 state counts

Part 3:
- DFS: 5
- BFS: 5

Part 5:
- DFS: 29
- BFS: 23
- DLS: 24

Part 6:
- BFS:
    - Move to sample: 3
    - Remove sample: 6
    - Return to charger: 4
- DFS:
    - Move to sample: 5
    - Remove sample: 6
    - Return to charger: 5

Question 3 state counts

Part C
- UCS:

    - Loc = (8,8): 31
    - Loc = (4,4): 31
- A *: 31
    - Loc = (8,8): 31
    - Loc = (4,4): 22

Question 5

a) One advancement was the new chess chip that included hardware repetition detection, specialized move generation modes, and efficiency improvements that increased speed. The idea of using new hardware to improve speed is transferable to other problems, as well as tailoring specific search keywords to answer a specific solution. Specific to chess were search keys that generate all the moves that do one thing (check, attack one piece, protect a space, etc). Another advancement was the increased number of chess chips, and a newer generation of computer. Next was better debugging and preparation with the inclusion of better software tools. Finally, there was more testing the evaluation function. The problem solving abilities of these problems are all applicable to other problems, with using newer technology, allowing for problem-specific search queries, and more testing and designing.
b) AlphaZero uses a Monte-Carlo search algorithm that returns a vector that has a probability assigned to each move. DeepBlue uses brute force, so since AlphaZero can selectively search, it's able to search faster. AlphaZero does not have to evaluate every node possible, but DeepBlue does. Therefore, AlphaZero is able to solve problems faster.