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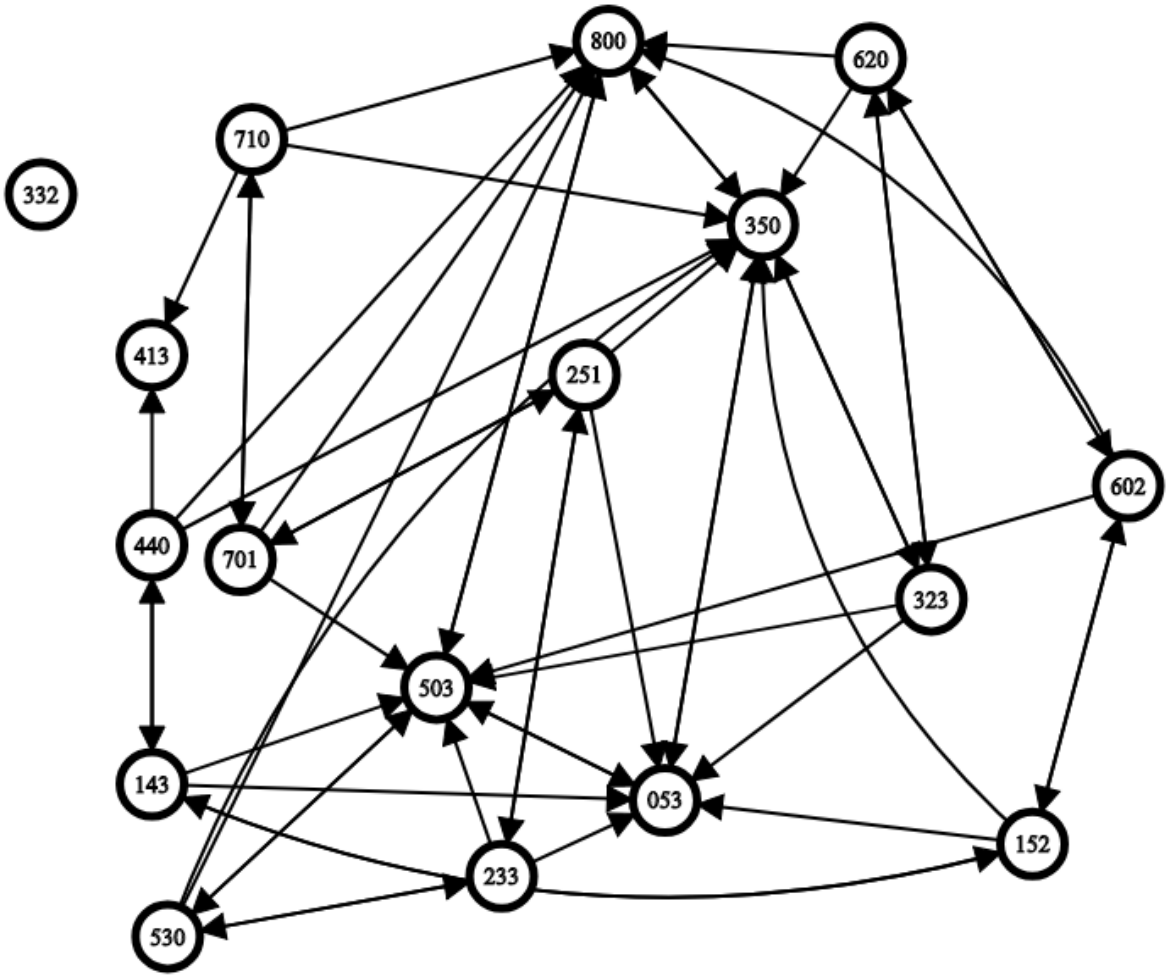
1. State Space
    a. Initial State
        1. If each of the three beakers is defined in a triplet as (a,b,c), a being the 8ml beaker, b being 5ml, and c being 3ml, then the initial state is (8,0,0)
    b. Goal State
        1. The goal state is defined as having 4ml of the solution in either beaker a or beaker b. Goal states are described as (1,4,3) or (4,1,3) or (4,4,0)
    c. Operators
        1. There are 6 total operators pouring from A to B, from A to C, from B to A, from B to C, from C to A, and from C to B. Each pour is performed by pouring contents from beaker X into beaker Y until either beaker X is empty, or beaker Y is full, whichever comes first.
2. Graph
    a. There are 16 states
        1. (8,0,0)
        2. (3,5,0)
        3. (3,2,3)
        4. (6,2,0)
        5. (6,0,2)
        6. (1,5,2)
        7. (1,4,3)
        8. (4,4,0)
        9. (4,1,3)
        10. (5,0,3)
        11. (0,5,3)
        12. (5,3,0)
        13. (2,3,3)
        14. (2,5,1)
        15. (7,0,1)
        16. (7,1,0)
    b. And 54 arcs
        1. 800 to 503
        2. 800 to 350
        3. 503 to 800
        4. 503 to 530
        5. 503 to 053
        6. 530 to 503
        7. 530 to 800
        8. 530 to 233
        9. 530 to 350
        10. 350 to 800
        11. 350 to 053
        12. 350 to 323
        13. 053 to 350
        14. 053 to 503
        15. 323 to 053
        16. 323 to 350
        17. 323 to 503
        18. 323 to 620
        19. 233 to 530
        20. 233 to 053
        21. 233 to 503
        22. 233 to 251
        23. 251 to 701
        24. 251 to 053
        25. 251 to 233
        26. 251 to 350
        27. 701 to 800
        28. 701 to 251
        29. 701 to 503
        30. 701 to 710
        31. 710 to 701
        32. 710 to 800
        33. 710 to 413
        34. 710 to 350
        35. 620 to 800
        36. 620 to 602
        37. 620 to 323
        38. 620 to 350
        39. 602 to 620
        40. 602 to 800
        41. 602 to 152
        42. 602 to 503
        43. 152 to 350
        44. 152 to 053
        45. 152 to 602
        46. 152 to 143
        47. 143 to 152
        48. 143 to 503
        49. 143 to 053
        50. 143 to 440
        51. 440 to 413
        52. 440 to 143
        53. 440 to 800
        54. 440 to 350


800
620
710
332
350
413
251
602
440
701
323
503
143
053
152
233
530

3. The shortest path to a goal state is 6 operations
    a. (8,0,0)
        1. A to B
    b. (3,5,0)
        1. B to C
    c. (3,2,3)
        1. C to A
    d. (6,2,0)
        1. B to C
    e. (6,0,2)
        1. A to B
    f. (1,5,2)
        1. B to C
    g. (1,4,3)
4. (3,3,2)
    a. The state (3,3,2) is an impossible state, there is no way to obtain that state with the current set of operators available, so if it is to be represented as a state, it is an island on the graph and cannot be reached.