1a Gold mine problem I/P $\begin{bmatrix} 2 & 5 & 9 \\ 4 & 8 & 7 \\ 3 & 5 & 6 \end{bmatrix}$ o/p: [(1,0) (1,1) 0,2) sum=4+8+9=21

1b All path solution sequence

```
graph = {
    'A': ['B', 'C'],
    'B': ['D','A'],
    'C': ['A','D','E'],
    'D': ['B','C','E'],
    'E': ['C','D']
}
All paths from A to D:
['A', 'B', 'D']
['A', 'C', 'D']
['A', 'C', 'E', 'D']
```

2a Magic square I/p: $\begin{bmatrix} 2 & 7 & 6 \\ 9 & 5 & 1 \\ 4 & 3 & 8 \end{bmatrix}$ o/p : "yes it is magic square"

2b DFS traversal solution. If the visited node is odd number add 1 to the sum, if it is even add 2 to the sum ·

Print the traversal path and the summation
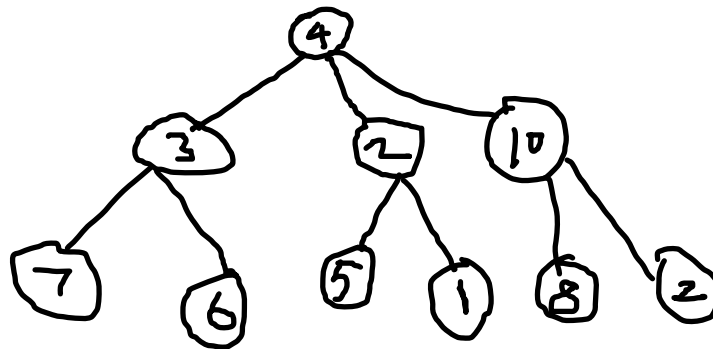
O/P: sol. Path: 4-3-7-6-2-5-1-10-8-2   sum: 2+1+1+2+2+1+1+2+2+2=16

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3 a array rotation – 2 times left side

  I/P: [23,4,56,72,98,12] o/p: [56,72,98,12,23,4]

3b mice hole problem

i/p:
$\begin{array}{llllll} mice & 23 & -3 & 32 & -2 & 45 \\ hole & 20 & 10 & 35 & 15 & 50 \end{array}$

o/p: time taken by 0 th mouse is: 13

    time taken by 1 th mouse is: 17
    time taken by 2 th mouse is: 3
    time taken by 3 th mouse is: 3

```
        time taken by  4 th mouse is:   5
     MAximum time taken is:   17


Mice and hole

How many kids?: 5
enter kids positions: -23
enter kids positions: -14
enter kids positions: 9
enter kids positions: -45
enter kids positions: -10
Enter chocolate positions: 3
Enter chocolate positions: 4
Enter chocolate positions: 5
Enter chocolate positions: 6
Enter chocolate positions: 7


the time taken by  0 th child is:   48
the time taken by  1 th child is:   27
the time taken by  2 th child is:   19
the time taken by  3 th child is:   16
the time taken by  4 th child is:   2
MAximum time taken is:   48
```
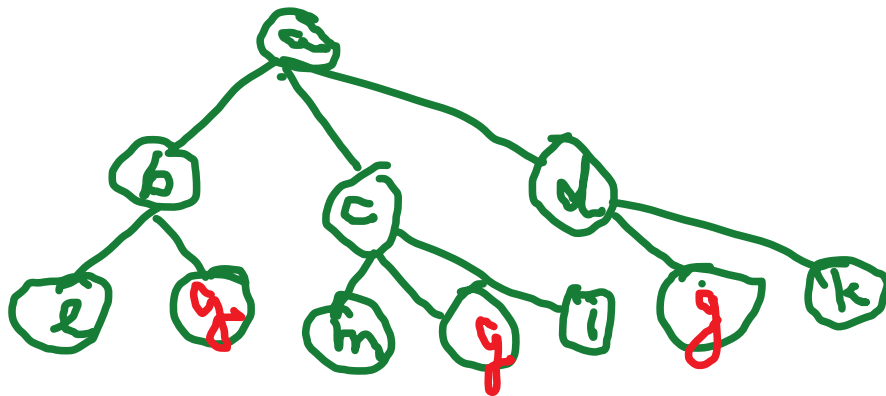

4a kronecker product $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix} = \begin{bmatrix} 1 & 5 & 2 & 10 \\ 3 & 4 & 12 & 14 \\ 3 & 15 & 4 & 20 \\ 18 & 21 & 24 & 28 \end{bmatrix}$

4b BFS goal solution – more than one goal

o/p: a-b-c-d-e-g

 first goal found

m-g

second goal found

i-g

third goal found

k

sol path: a-b-c-d-e-g-m-g-i-g; three goal are found

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5 a Get a diagonal n×n matrix and swap the diagonal elements and print the matrix. Print sum of diagonal elements.

5b Apply UCS tot eh following graph and print the solution path