Initial State = 1 2 3   Final State = 1 2 3
               0 4 5   4 5 6
               7 8 6   7 8 0

Input:

Initial state is taken as input from user as a series of 9 numbers with blank represented as 0.

Output:

In the output we represent the moves by position number in the matrix like in the above input state.

00 01 02
10 11 12
20 21 22

Phase C
I)Length of the path
1)BFS : Number of moves from initial state to goal state are 3
2)DFS :Number of moves from initial state to goal state are 39
3)DFID : Number of moves from initial state to goal state are 3

II)Number of states visited during the search

1)BFS : Number of states explored are 17
2)DFS : Number of states explored are 40
3)DFID : Number of states explored are 15

III)Analysis of whether or not the result depend on the order in which the neighbors of each node are added into the list

Breadth First Search :

There will be not much of a difference in BFS becuase it anyways explores the nodes level wise, therefore even if we add from left to right or right to left, when the branching factor is small it is not much of a diiference. (It maintains a queue where the neighbours produced by moveGen functon are added at the tail of queue)

Depth First Search :

But in DFS, the number of states vistited will change, for example, if the tree is a binary tree with a very large depth, the right child of the root is the goal state and the nodes are added from left to right,Depth Firsrt Search covers the whole left branch of the tree before finding the goal state. But if the nodes are added from right to left then the goal state is found in the first iteration.

Depth First Iterative Deepening :

DFID will be same as BFS even though it runs DFS on each node, it runs on the nodes level wise, so the order in which the nodes are added does'nt matter as long as the branching factor is not so large.

(Initial state)

(A)   (B)
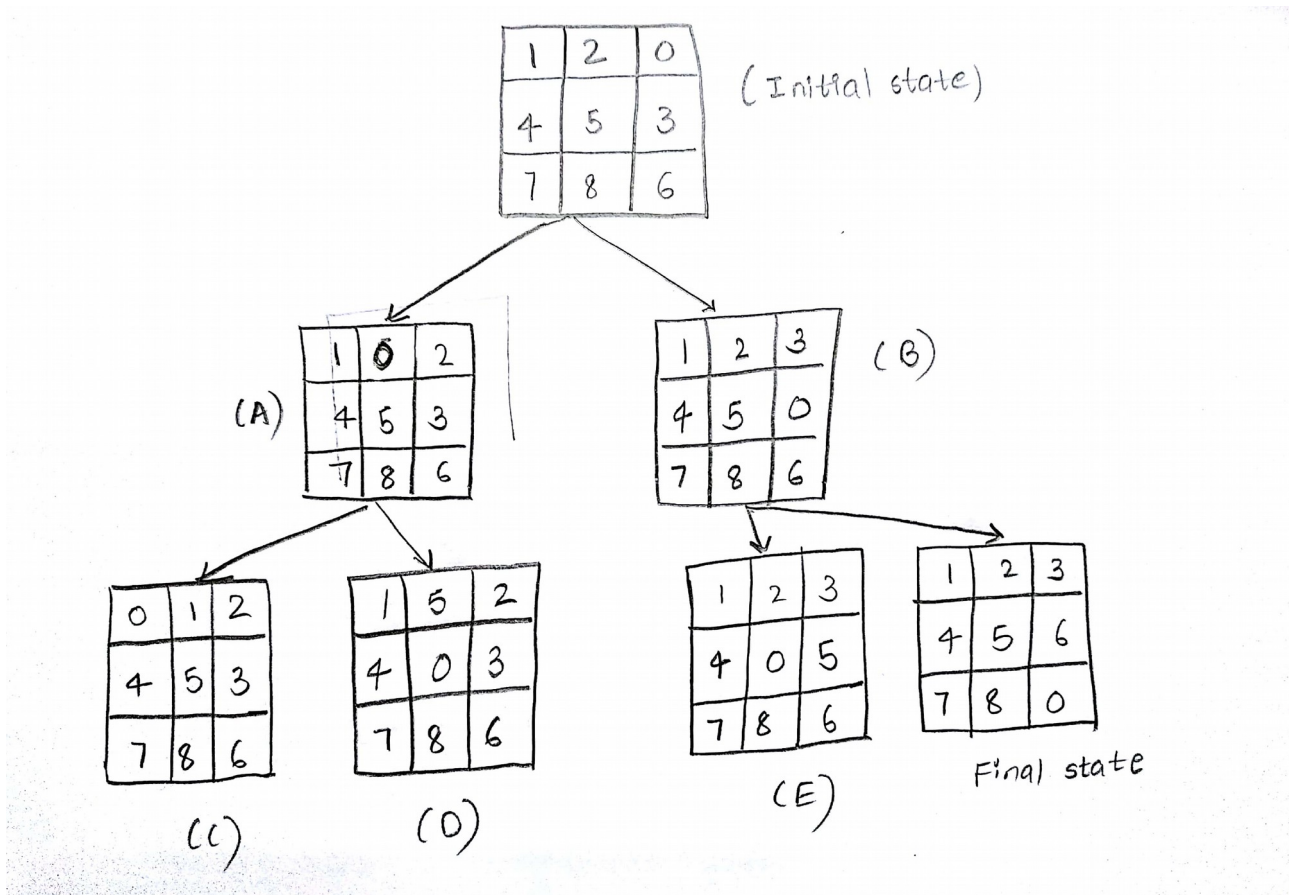
(C)   (D)   (E)   Final state

I : Initial State   F : Final State
BFS :
1st iteration : I
2nd iteration : IAB
3rd iteration : IABCDEF

DFS:
1st iteration : I
2nd iteration : IA
3rd iteration : IAC

DFID:
1st iteration:I
2nd iteration: IAB
3rd iteration:IACDBEF