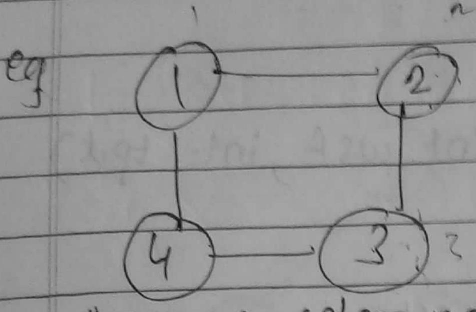
Graph Coloring

A graph G(V, E) is given. we need to color the graph using m colors in such a way that no 2 adjacent nodes can have the same color. This problem is referred as m-colorability decision problem

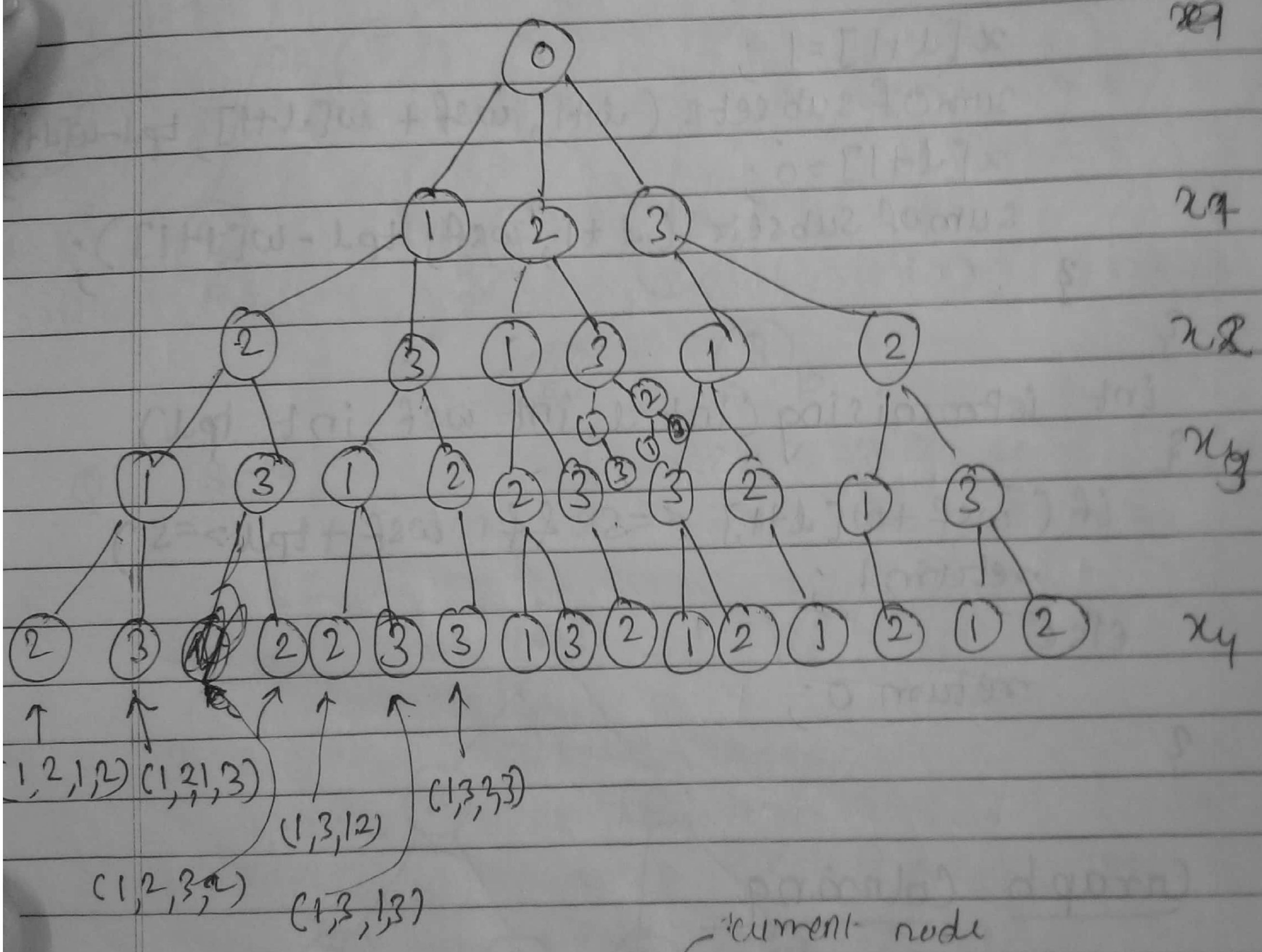
where m is chromatic no.
— " ——— minimum no. of colors required to color the graph

eg



$$\begin{matrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{matrix}$$

Assume color no. are 1, 2, 3
↑ ↑ ↑
R G B



```
                         current node
void mcolor (int nd)   ↙
{                            no. of colors
    for(c = 1 ; c <= m ; c++)  ↙
    {
        if ( canColor(nd, c) )
        {
            X[nd] = c ;
        if(nd==n)
        {
            //print soln vector
        }
        else
        {
            mcolor(nd+1);
        }
    }
}
int canColor(int nd, int c)
{
    for( i=1 ; i< =nd-1 ; i++)
    {
        if( adj[nd][i]==1 && x[i]==c)
            return 0;
    }
    return 1;
}
```