

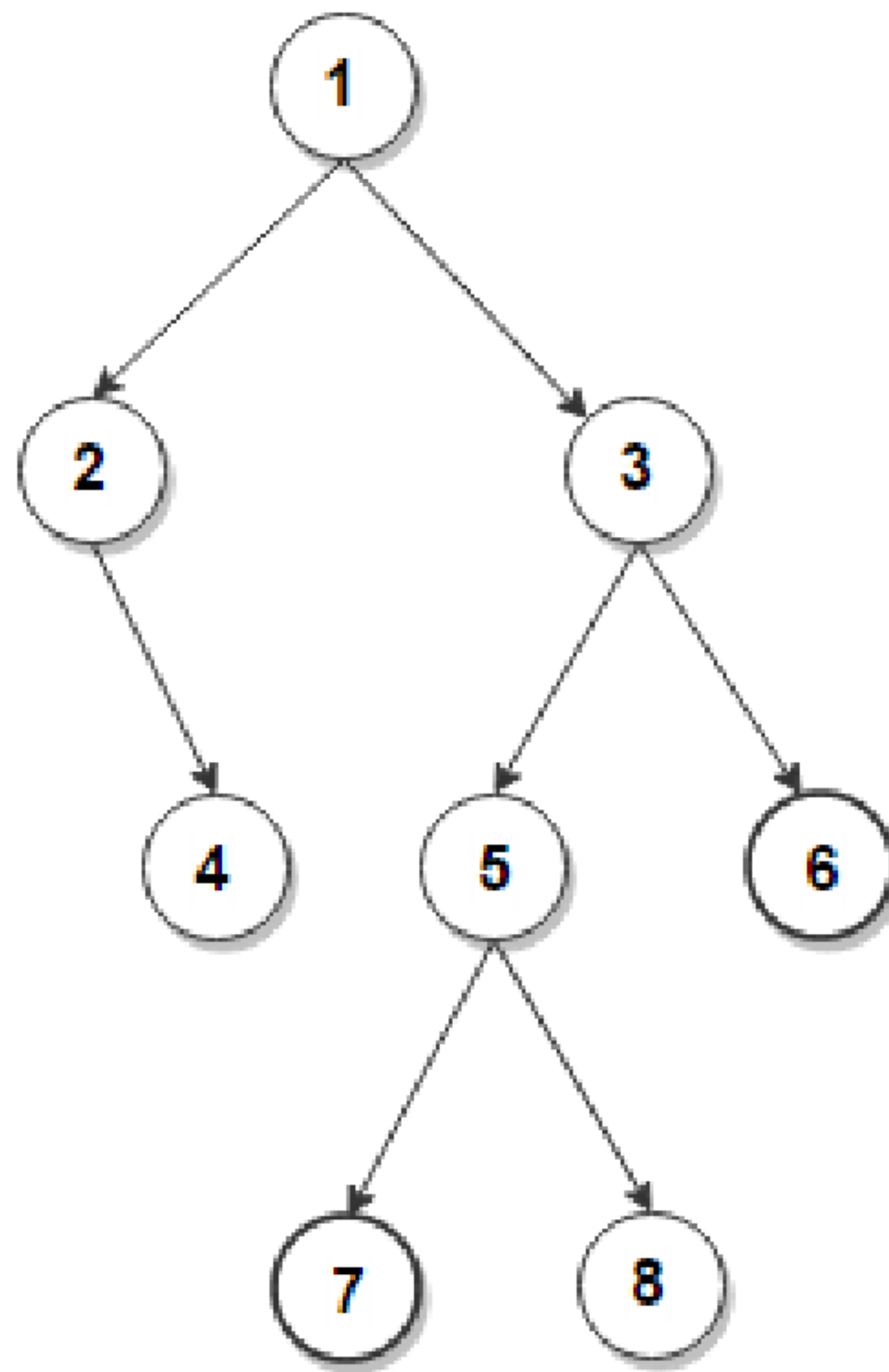
Lowest Common Ancestor

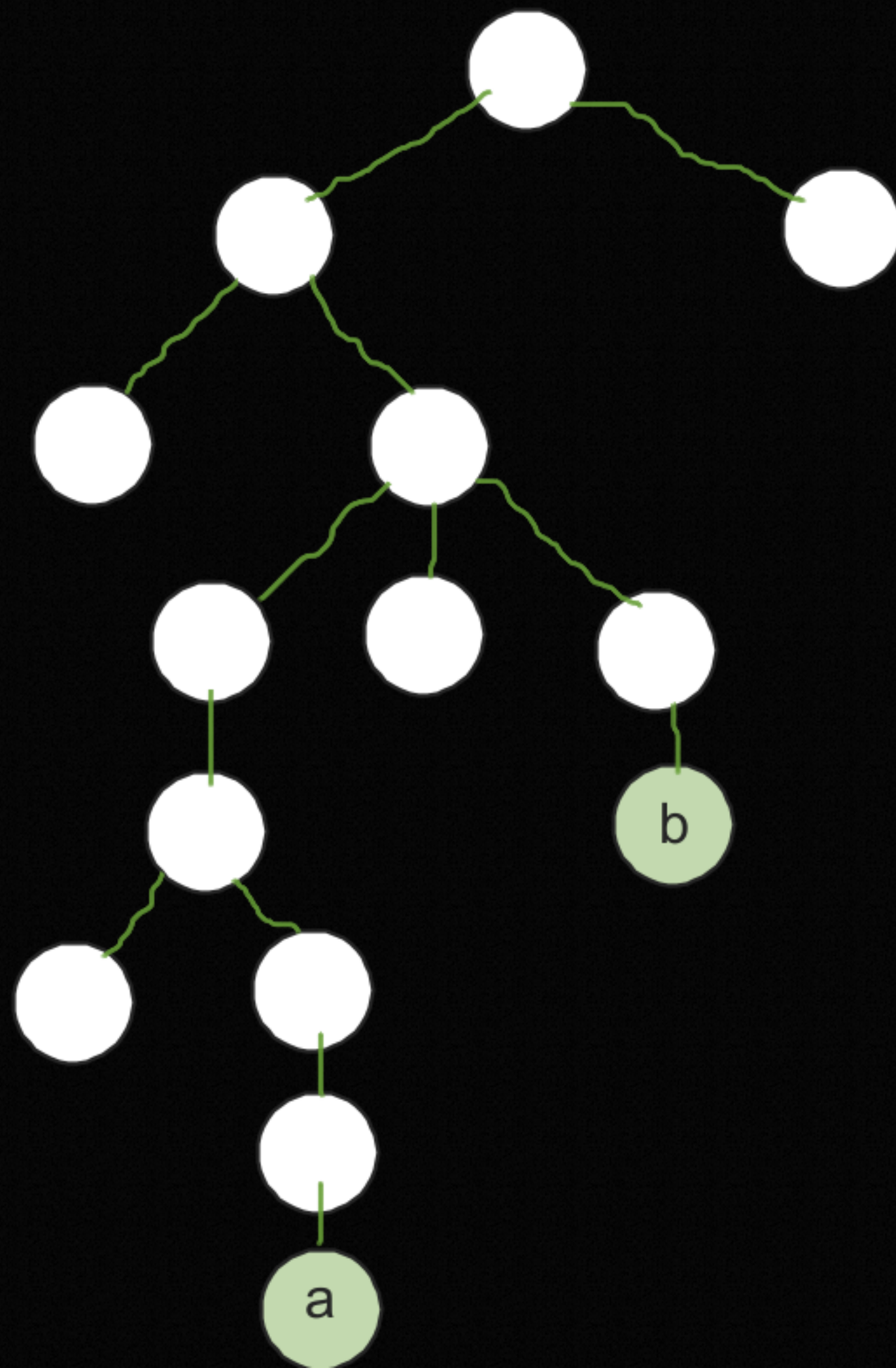
$$\text{LCA}(6, 7) = 3$$

$$\text{LCA}(5, 8) = 5$$

$$\text{LCA}(3, 6) = 3$$

$$\text{LCA}(2, 5) = 1$$





depth(a) = 7

depth(b) = 4

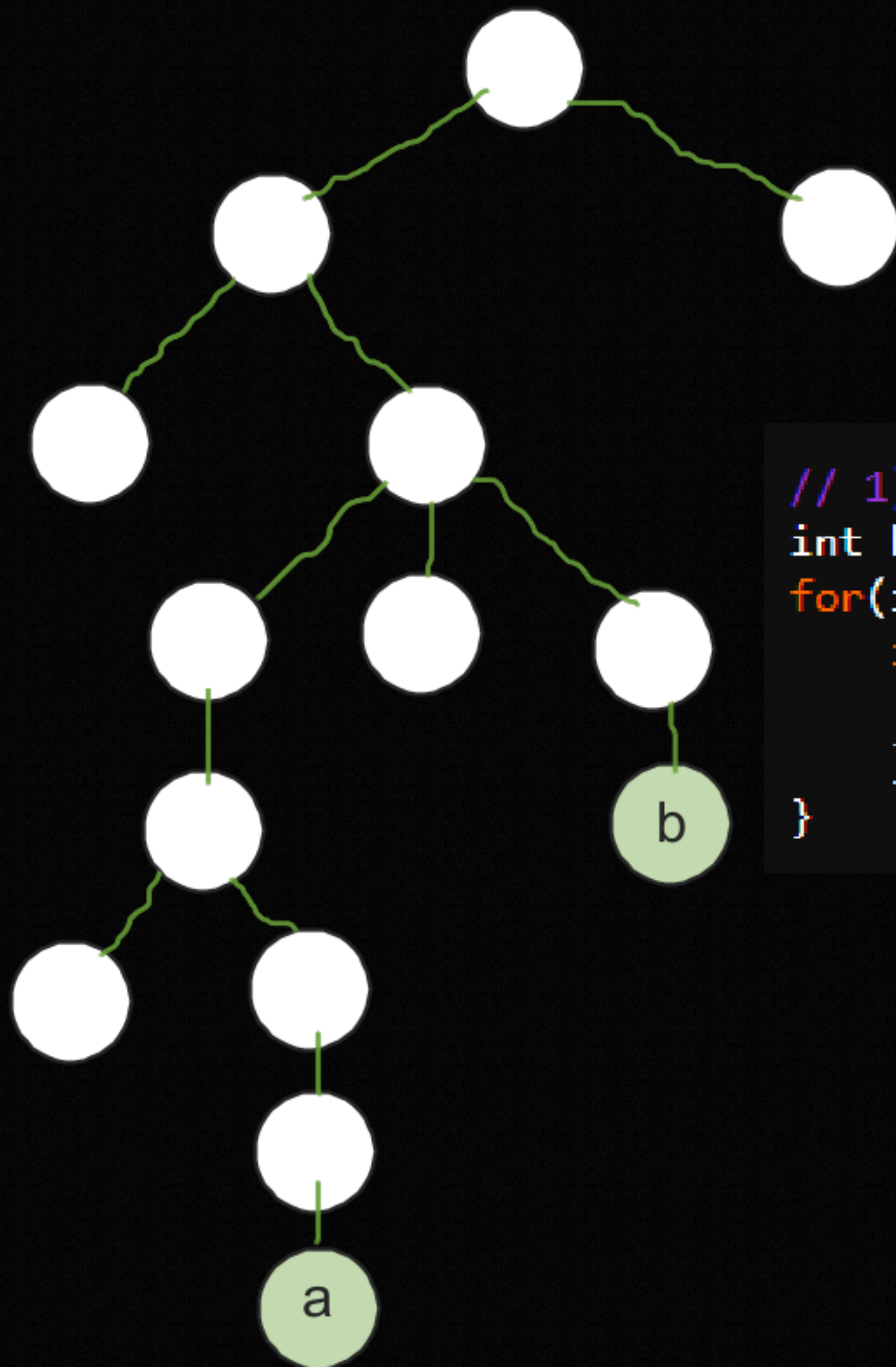
$k = 7 - 4$

$k = 3$

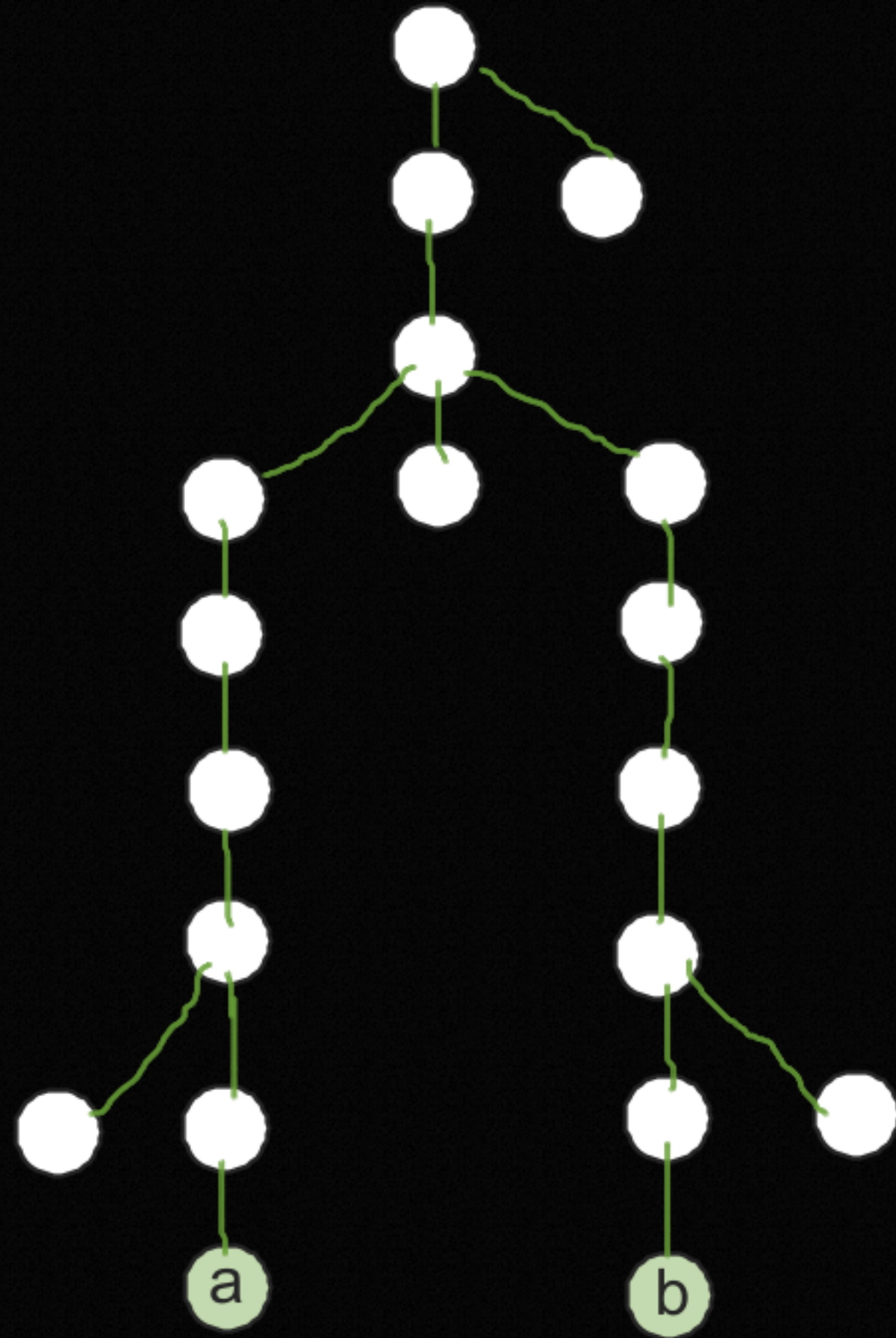
binary of 3 => 11

=> $2^1 + 2^0$

=> $2 + 1$



```
// 1) Get same depth.  
int k = depth[a] - depth[b];  
for(int j = LOG - 1; j >= 0; j--) {  
    if(k & (1 << j)) {  
        a = up[a][j]; // parent of a  
    }  
}
```

```
// 3) move both a and b with powers of two
for(int j = LOG - 1; j >= 0; j--) {
    if(up[a][j] != up[b][j]) {
        a = up[a][j];
        b = up[b][j];
    }
}
return up[a][0];
```