

HW 4

1) Penguin
chicken

1 2 3 4 5 6 7
P E N G U I N
C H I C K E N
C H I C K E N

a)

		0	1	2	3	4	5	6	7
P	0	0	0	0	0	0	0	0	0
E	1	0	0	0	0	0	0	0	0
N	2	0	0	0	0	0	0	1	1
G	3	0	0	0	0	0	0	1	2
U	4	0	0	0	0	0	0	1	2
I	5	0	0	0	1	1	1	1	2
N	6	0	0	0	1	1	1	1	2

if $A[i] > A[j]$

$dp[i] = \max(dp[i], dp[j] + 1)$

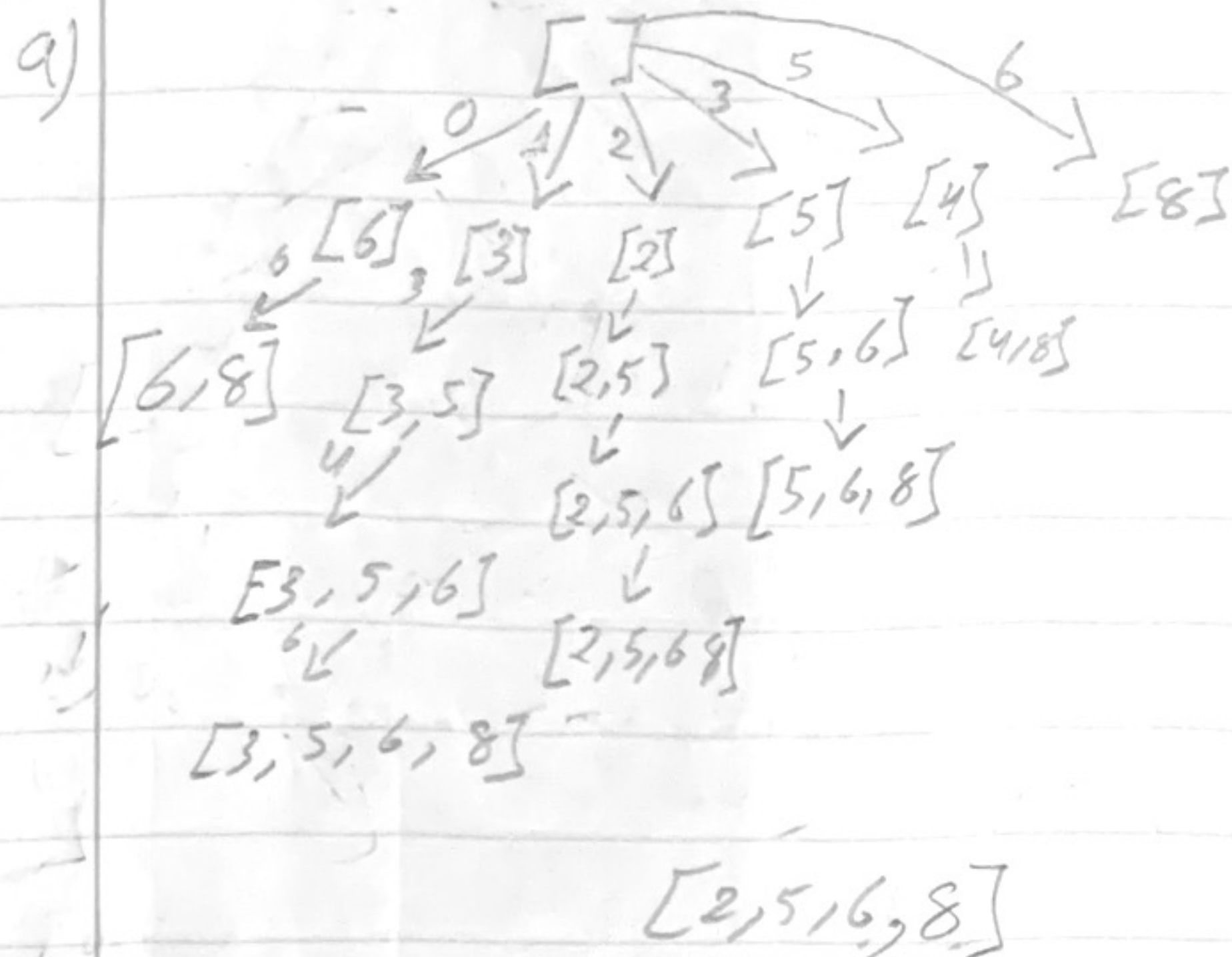
return max(dp)

b)

"EN"
"IN"

See the table

2) $A = [6, 3, 2, 5, 6, 4, 8]$



b)

```

dfs(path, i)
    if i >= length
        return (length(path))
    interval = 0
    for j = i to length
        if not path and path[j] < A[i]:
            interval = dfs(path + [A[i]], i+1)
    exclval = dfs(p, i+1)
    return max(exclval, interval)
    
```

$O(n^2)$

c) $A = \text{nums}[0]$

for n in $\text{nums}[1:]$

$\text{index} = \text{bisect}(A, n)$

 if $\text{index} = \text{length of } A$:

$A.\text{push}(n)$

 else:

$A[\text{index}] = n$

$O(n \log n)$