Catalan in C++

```
#include <iostream>
using namespace std;

int main() {
    int n = 6;
    int dp[n];
    dp[0] = 1;
    dp[1] = 1;

    for (int i = 2; i < n; i++) {
        dp[i] = 0;
        for (int j = 0; j < i; j++) {
            dp[i] += dp[j] * dp[i - j - 1];
        }
    }

    for (int i = 0; i < n; i++) {
        cout << dp[i] << " ";
    }

    return 0;
}
```

Step-by-Step Execution

Initialization:

```
dp[0] = 1;
dp[1] = 1;
```

Iteration Table for `dp[2]` to `dp[5]`

i	j	Computation	dp[i]
2	0	dp[0]×dp[1]=1×1=1	1
2	1	dp[1]×dp[0]=1×1=1	**2**

Final: `dp[2] = 2`

i	j	Computation	dp[i]
3	0	dp[0]×dp[2]=1×2=2	2
3	1	dp[1]×dp[1]=1×1=1	3
3	2	dp[2]×dp[0]=2×1=2	**5**

Final: `dp[3] = 5`

i	j	Computation	dp[i]
4	0	dp[0]×dp[3]=1×5=5	5
4	1	dp[1]×dp[2]=1×2=2	7
4	2	dp[2]×dp[1]=2×1=2	9
4	3	dp[3]×dp[0]=5×1=5	**14**

Final: `dp[4] = 14`

i	j	Computation	dp[i]
5	0	dp[0]×dp[4]=1×14=14	14
5	1	dp[1]×dp[3]=1×5=5	19
5	2	dp[2]×dp[2]=2×2=4	23
5	3	dp[3]×dp[1]=5×1=5	28
5	4	dp[4]×dp[0]=14×1=14	**42**

Final: `dp[5] = 42`

Final DP Array:

```
dp[] = {1, 1, 2, 5, 14, 42}
```

Final Output:

```
1 1 2 5 14 42
```

Output:-

1 1 2 5 14 42