Rod cutting In C++

```cpp
#include <iostream>
#include <vector>
#include <algorithm>

using namespace std;
int solution(vector<int>& prices) {
    vector<int> np(prices.size() + 1);
    for (int i = 0; i < prices.size(); i++) {
        np[i + 1] = prices[i];
    }

    vector<int> dp(np.size());
    dp[0] = 0;
    dp[1] = np[1];

    for (int i = 2; i < dp.size(); i++) {
        dp[i] = np[i];

        int li = 1;
        int ri = i - 1;
        while (li <= ri) {
            if (dp[li] + dp[ri] > dp[i]) {
                dp[i] = dp[li] + dp[ri];
            }

            li++;
            ri--;
        }
    }

    return dp[dp.size() - 1];
}

int main() {
    vector<int> prices = {1, 5, 8, 9, 10, 17, 17, 20};

    cout << solution(prices) << endl;

    return 0;
}
```

Dry Run (Tabular)

Given Prices

```
Length:  1   2   3   4   5   6   7   8
Prices:  1   5   8   9   10  17  17  20
```

DP Computation Table

Rod Length (i)	Price (np[i])	Possible Cuts (li, ri)	Best Revenue (dp[i])
1	1	(1)	1
2	5	(1,1) → 1+1=2	5
3	8	(1,2) → 1+5=6, (2,1) → 5+1=6	8
4	9	(1,3) → 1+8=9, (2,2) → 5+5=10	10
5	10	(1,4) → 1+10=11, (2,3) → 5+8=13	13
6	17	(1,5) → 1+13=14, (2,4) → 5+10=15, (3,3) → 8+8=16	17
7	17	(1,6) → 1+17=18, (2,5) → 5+13=18, (3,4) → 8+10=18	18
8	20	(1,7) → 1+18=19, (2,6) → 5+17=22, (3,5) → 8+13=21, (4,4) → 10+10=20	22

Final answer

The maximum revenue we can get for **length = 8** is **22**.

Output:-
22