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jigarpandya.ce@gmail.com

NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Getting Started With Competitive Programming (course)

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Week 1 Practice Programming Assignment 1

Due on 2023-10-29, 23:59 IST

Course outline

How does an NPTEL online course work? ()

Week 0 ()

Week 1 ()

- Welcome and Initial Setup (unit?unit=17&lesson=18)

You begin with a stack of n boxes.

Then you make a sequence of moves. In each move, you divide one stack of boxes into two nonempty stacks. The game ends when you have n stacks, each containing a single box. You earn points for each move; in particular, if you divide one stack of height a + b into two stacks with heights a and b, then you score ab points for that move. Your overall score is the sum of the points that you earn for each move.

What strategy should you use to maximize your total score?

As an example, suppose that we begin with a stack of n = 10 boxes. Then the game might proceed as follows:

```
At the start: one stack of height 10

The next steps show the stack sizes first followed by the score earned
by the split.

5 5 25 points
5 3 2 6 points
4 3 2 1 4 points
2 3 2 1 2 4 points
2 2 2 1 2 1 2 points
1 2 2 1 2 1 1 1 points
1 1 2 1 2 1 1 1 1 points
1 1 1 1 2 1 1 1 1 1 points
1 1 1 1 1 1 1 1 1 1 1  points
```

The total score in the example above is 45 points. Can you find a better strategy?

Input Format

The first line is **T**, the number of test cases.
The next T lines have one test case each.
Each test case is a number **1 <= N <= 10000**, which is the size of the first stack of boxes.

Output Format

For each test case, output the best possible score that you can earn with an optimal strategy.
Your output should have **N** lines, with the i-th line containing the answer for the i-th test case.

Your last recorded submission was on 2023-07-28, 17:19 IST

- Week 1 Practice Programming Assignment 2 (/noc23_cs103/progassignment?name=244)

Week 2 ()

Download Videos ()

Transcripts ()

Select the Language for this assignment. C++

```
1  //============================================================================
2  // Name        : PartitioningNBoxesMaximally.cpp
3  // Author      : ProfJigarPandya
4  // Version     :
5  // Copyright   : GNU General Public License v3.0
6  // Description : Hello World in C++, Ansi-style
7  //You begin with a stack of n boxes.
8  //Then you make a sequence of moves. In each move, you divide one s
9  //What strategy should you use to maximize your total score?
10 //============================================================================
11
12 #include <iostream>
13 using namespace std;
14
15
16 void partition(int n, int & cost);
17 int main() {
18
19     int cost;
20     int testcases;//T, the number of test cases.
21     cin>>testcases;
22     int n;//size of the first stack of boxes
23     for(int pass=1;pass<=testcases;pass++)
24
```

You may submit any number of times before the due date. The final submission will be considered for grading.

This assignment has Public Test cases. Please click on "Compile & Run" button to see the status of Public test cases. Assignment will be evaluated only after submitting using Submit button below. If you only save as or compile and run the Program , your assignment will not be graded and you will not see your score after the deadline.

Save as Draft | Compile & Run | Submit | Reset

Private Test cases used for Evaluation	Status
Test Case 1	Passed