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



Click to register for Certification exam

Week 1 Practice Programming Assignment 1

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

(https://examform.hptel.ac.in/2023_10/exam_form/dashboard)

If already registered, click to check your payment status

Course outline

How does an NPTEL online course work?

Week 0 ()

Week 1 ()

Welcome and Initial Setup (unit? unit=17&lesson=18) Reversort (unit? unit=17&lesson=19)

Engineering Reversort (unit? unit=17&lesson=20)

Number Game (unit? unit=17&lesson=21)

Will It Stop? (unit?

unit=17&lesson=22)

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 <u>3</u> 2 1 2 4 points 2 2 2 1 2 1 2 points 1 2 2 1 2 1 1 1 points 1 1 <u>2</u> 1 2 1 1 1 1 points 1 1 1 1 <u>2</u> 1 1 1 1 1 points

1 1 1 1 1 1 1 1 1 1 1 points

(/noc23 cs103/progassignment? name=240)

Week 1 Programming

Input Format

(/noc23 cs103/progassignment?

The first line is **T**, the number of test cases. name=241)

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.

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

Output Format

Week 1 **Practice Programming Assignment 1**

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-

(/noc23_cs103/progasstontestrease. name=243)

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

Feedback

Week 1

Form: Getting Started with Competitive

Programming (unit?

unit=17&lesson=24)

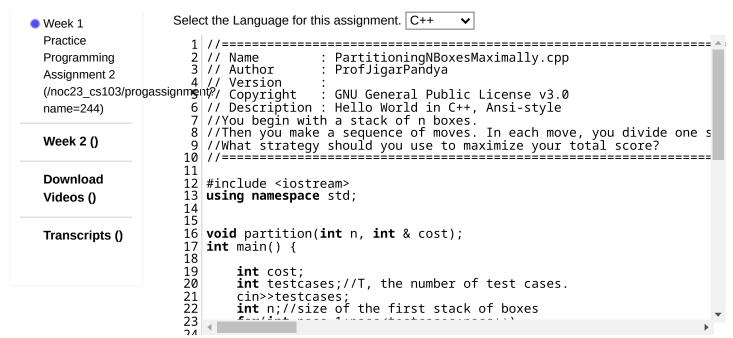
Quiz: Week 1 : Assignment (assessment? name=239)

Week 1 Programming Assignment Q1

Assignment Q2

O Practice: Week 1: Assignment 1(Non Graded)

(assessment? name=242)



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.



Private Test cases used for Evaluation	Status
Test Case 1	Passed