CSE100 Algorithm Design and Analysis Lab 07, Spring 2022
Deadline: 14-MAR, 11:59pm

Note:

- As usual, we will grade immediately after the deadline to give you feedback. *However, for this assignment, there will be no penalty for violating the deadline and submitting during the grace period.*
- As usual, the assignment will no longer be available for submission after the **Available until** date. This is your absolute deadline.

Dynamic Programming: Rod Cutting

Description In this assignment you are asked to implement a dynamic programming algorithm for the Rod Cutting Problem (chapter 15.1). In the Rod Cutting problem, you are given an integer $n \geq 1$, along with a sequence of positive prices, $p_1, p_2, ..., p_n$, where p_i is the market price of a rod of length i. The goal is to figure out a best way of cutting the given rod of length n to generate the maximum revenue. You can assume that the given prices $p_1, p_2, ..., p_n$ are all integers.

Input The input has the following format. The input starts with n. Then, $p_1, p_2, ..., p_n$ follow, one per each line.

Output In the first line, output the maximum revenue (r_n), followed by an enter key. In the second line, sequentially output the length of each piece in your optimal cutting, followed by a space key. The second line must end by -1 and an enter key.

Examples of input and output
Input

```
7
1
5
8
9
10
17
17
```

Output

```
18
1 6 -1
```

The following is the output with white characters shown.

```
18(enter)
1(space)6(space)-1(enter)
```

Alternatively, the second line can be replaced with “6 1 -1”, “2 2 3 -1”, “2 3 2 -1”, or “3 2 2 -1”. That is, any sequence of piece lengths giving the maximum revenue will be considered to be correct.

See the lab guidelines for submission/grading, etc., which can be found in Files/Labs.