

Lab 7 – Practice

Divide and Conquer

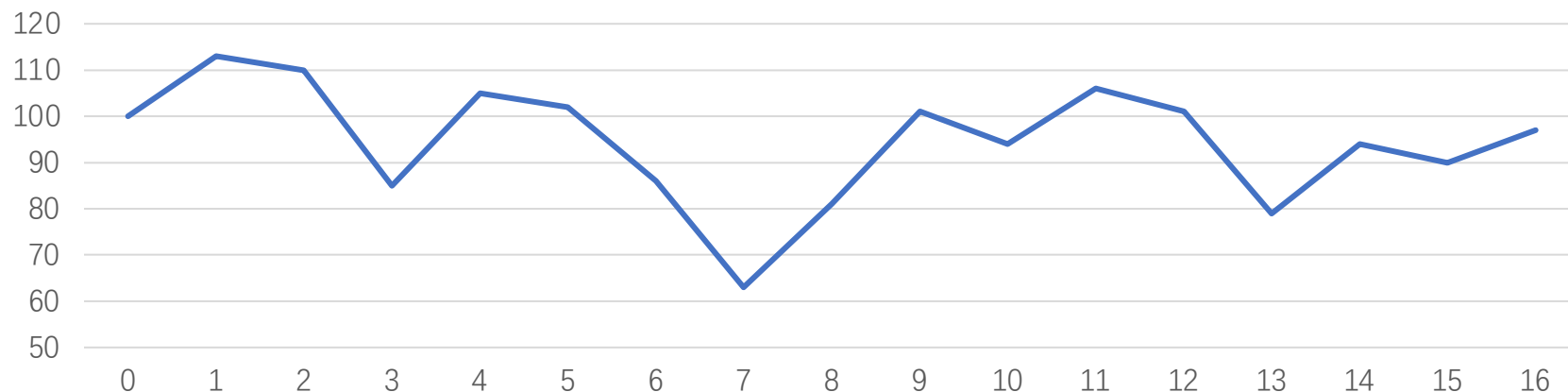
CS208 Algorithm Design and Analysis

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Question: Maximum profit

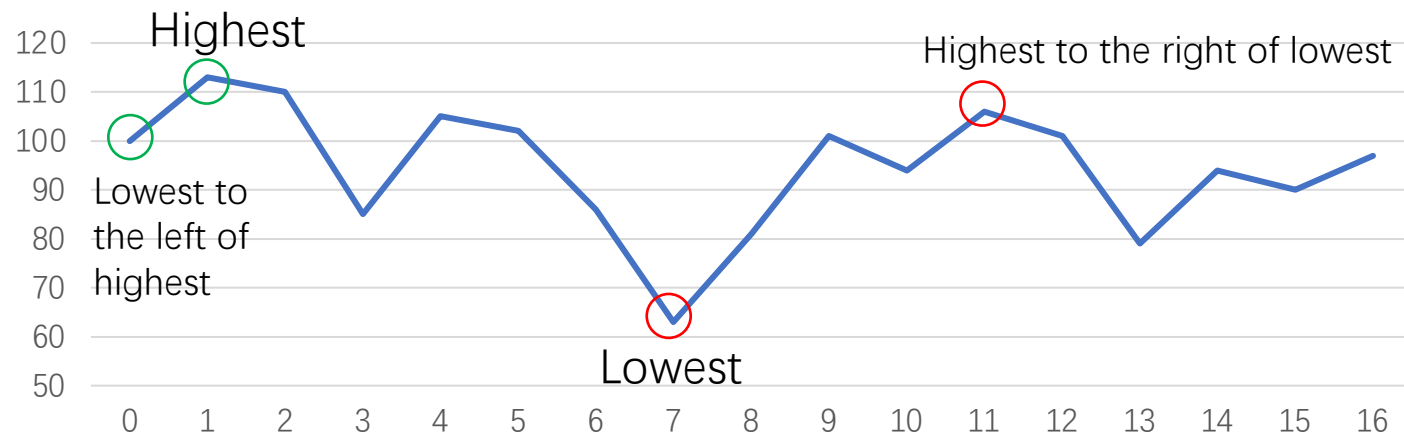
- If you have an opportunity to invest..
 - Buy one unit at one time, and then sell it at a later time.
 - Goal: to maximize the profit, “buy low, sell high”

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Price	100	113	110	85	105	102	86	63	81	101	94	106	101	79	94	90	97



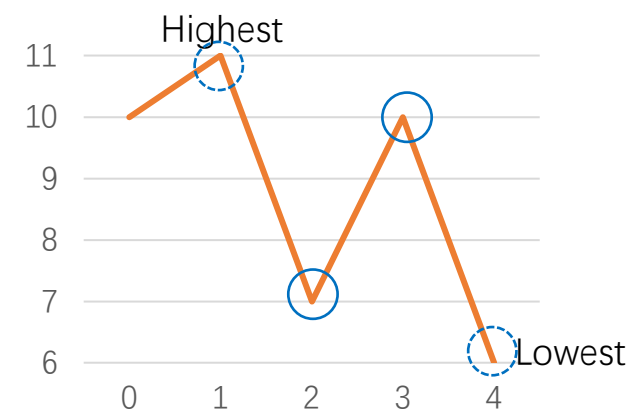
Question: On which days to buy and sell?

Strategy: seek global maxima?



Best strategy: buy at Day 7 and sell at Day 11

Does not always work!



Strategy: divide and conquer



Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Price	100	113	110	85	105	102	86	63	81	101	94	106	101	79	94	90	97

- **Divide** the problem into a number of subproblems that are smaller instances of the same problem
- **Conquer** the subproblems by solving them recursively
- **Combine** the solutions to the subproblems into the solution for the original problem

Grading

- Implemented and evaluated within a week.
- Total point: 1

Input:

100 113 110 85 105 102 86 63 81 101 94 106 101 79 94 90 97

Output:

7 11 43



Day in Day out Max profit