

Let  $OPT(i)$  denote the minimum cost of a solution for weeks 1 through  $i$ . In an optimal solution, we either use company  $A$  or company  $B$  for the  $i^{\text{th}}$  week. If we use company  $A$ , we pay  $rs_i$  and can behave optimally up through week  $i - 1$ . If we use company  $B$  for week  $i$ , then we pay  $4c$  for this contract, and so there's no reason not to get the full benefit of it by starting it at week  $i - 3$ ; thus we can behave optimally up through week  $i - 4$ , and then invoke this contract.

Thus we have

$$OPT(i) = \min(rs_i + OPT(i - 1), 4c + OPT(i - 4)).$$

We can build up these  $OPT$  values in order of increasing  $i$ , spending constant time per iteration, with the initialization  $OPT(i) = 0$  for  $i \leq 0$ .

The desired value is  $OPT(n)$ , and we can obtain the schedule by tracing back through the array of  $OPT$  values.

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<sup>1</sup>ex382.12.857