# The Algorithm

Iterative-Compute-Opt

M[-1]= 0

M[0]= 0

for j = 1, 2, . . . , n

M[j]= max(vj + M[j-2], M[j − 1])

endfor

return M[n]

# Proof of Correctness

We will prove by induction that this returns the optimal answer.

## Base Case

We want to prove M[1] returns the maximum amount of money Alice can earn if there were only the first shift available to her. By definition,

M[1] = max(v1 + M[-1], M[0])

= max(v1 + 0, 0)

= max(v1, 0)

= v1

Which is correct because if she only had the first shift available, that’s the most she could earn.

## Inductive Case