

Solving the DP

- Stage 4 computations – boundary conditions:

$$f_4(n) = 0 \quad \text{for } n = 0, 1, 2, 3$$

- Stage 3 computations:

$$f_3(3) = \min \left\{ 5 + 2(1) + 1(0) + f_4(0), 5 + 2(2) + 1(1) + f_4(1), 5 + 2(3) + 1(2) + f_4(2) \right\} = 7$$

$$f_3(2) = \min \left\{ 5 + 2(2) + 1(0) + f_4(0), 5 + 2(3) + 1(1) + f_4(1) \right\} = 9$$

$$f_3(1) = \min \left\{ \underline{5 + 2(3) + 1(0) + f_4(0)} \right\} = 11 \quad x_3 = 3$$

$$f_3(0) = +\infty$$

- Stage 2 computations:

$$f_2(3) = \min \left\{ 1(1) + f_3(1), 5 + 2(1) + 1(2) + f_3(2), 5 + 2(2) + 1(3) + f_3(3) \right\} = 12$$

$$f_2(2) = \min \left\{ 1(0) + f_3(0), 5 + 2(1) + 1(1) + f_3(1), 5 + 2(2) + 1(2) + f_3(2), 5 + 2(3) + 1(3) + f_3(3) \right\} = 19$$

$$f_2(1) = \min \left\{ 5 + 2(1) + 1(0) + f_3(0), 5 + 2(2) + 1(1) + f_3(1), 5 + 2(3) + 1(2) + f_3(2) \right\} = 21$$

$$f_2(0) = \min \left\{ 5 + 2(2) + 1(0) + f_3(0), \underline{5 + 2(3) + 1(1) + f_3(1)} \right\} = 23 \quad x_2 = 3$$

- Stage 1 computations – desired cost-to-go function:

$$f_1(0) = \min \left\{ \underline{5 + 2(1) + 1(0) + f_2(0)}, 5 + 2(2) + 1(1) + f_2(1), 5 + 2(3) + 1(2) + f_2(2) \right\} = 30 \quad x_1 = 1$$