COSC201: Tutorial Week 12 Dynamic Programming

Consider the following abstract dynamic programming problem, that computes a maximum "distance" via the recurrence relation:

$$d_{ij} = \begin{cases} 0 & \text{if } j < 1 \text{ or } j > n \\ j\%3 & \text{if } i = 1 \\ \max(d_{i-1,j-1} + 1, d_{i-1,j}, d_{i-1,j+1} + 2) & \text{otherwise} \end{cases}$$

- 1. Give a naive recursive algorithm to compute this distance.
- 2. Memoise the algorithm you created in the previous question.
- 3. Give an iterative dynamic programming algorithm to compute the distance.