function VALUE-ITERATION(M, R) **returns** a utility function
  inputs: M, a transition model
    R, a reward function on states
  local variables: U, utility function, initially identical to R
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  repeat
    $U \leftarrow U'$
    for each state i **do**
      $U'[i] \leftarrow R[i] + \max_a \sum_j M_{ij}^a U[j]$
    end
  until CLOSE-ENOUGH(U, U')
  return U