2D System Output By Employing Difference Equation Tutorial Exercise

A 2D system is described by the following equation:

$$y(n_1, n_2) - 0.9y(n_1, n_2) + 0.5y(n_1 - 1, n_2 - 1) = x(n_1, n_2).$$

Find $y(n_1, n_2)$ when $0 \leq n_1 < 3$, $0 \leq n_2 < 3$, if $x(n_1, n_2) = \delta(n_1, n_2)$, assuming that $y(n_1, n_2) = 0$ when $n_1 < 0$ or $n_2 < 0$.