FDTD

**Assignment 1 (Chapter 2)**

Implement in 1-D the scalar wave equation. Reproduce Figs. 2.3(a,b), 2.4(a,b), and 2.5 as described in Section 2.6.5 in [Taflove and Hagness, 2005]. Consider how many time steps you need to run each case of S to elapse the same total amount of time (what happens to dt if you reduce S by ½?), and how you need to change your source function when you change S.

Turn in your code and the figures. Make sure to comment your code! Use a Gaussian excitation:

\[
\exp\left[-\left(\frac{n-n_0}{n_{\text{half}}}\right)^2\right]
\]

Here, \(n_0\) and \(n_{\text{half}}\) are defined in terms of time steps. \(n_0\) is the delay (number of time steps that pass before your source reaches its maximum value). \(n_{\text{half}}\) is the half-width of the pulse. Use the same value for \(n_{\text{half}}\) as is stated in the text accompanying the figure in the book.