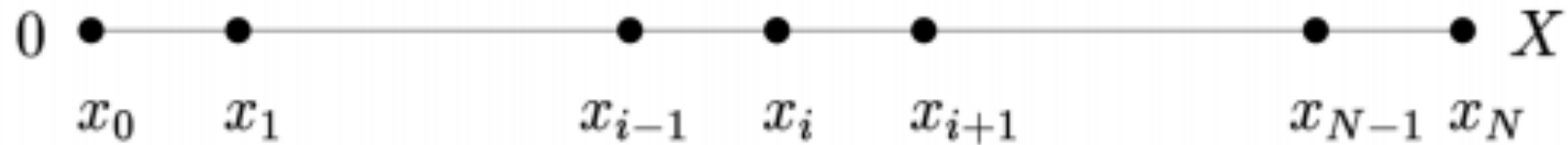# seismic wave animation

initialize parameters, create x

-you have values dx and L.

-we are not going to use x explicitly for updating! Also need to initialize u. Let u begin at 0's.

update u

$$\frac{\partial^2 u}{\partial t^2} = \beta^2 \frac{\partial^2 u}{\partial x^2}$$

$$\frac{\partial^2 u}{\partial x_i^2} = \frac{1}{\Delta x^2}\left(u_{ti}(x_i + 1) + u_{ti}(x_i - 1) - 2u_{ti}(x_i)\right)$$

$$\frac{\partial^2 u}{\partial t_i^2} = \frac{1}{\Delta t^2}\left(u_{xi}(t_i + 1) + u_{xi}(t_i - 1) - 2u_{xi}(t_i)\right)$$

at each step through the while loop, we solve for u in the next timestep, u(ti+1), which we call u3.

add signal

- signal is $sin^2(\pi \frac{t}{tlen})$, applied at xsource (50)

- your job is to find the entry in u3 corresponding to length 50 (i.e. which discretized x_i index is that), and overwrite it with $sin^2(\pi \frac{t}{tlen})$, but only for the first 5s, (i.e. if t <= tlen).

now plot!

- this is when we'll explicitly use the vector x we created.

- which u vector are we plotting against x?

- pause for .0001s before executing the loop again.

- for 10 pts. extra credit, figure out how to use getframe and movie to save the animation as a separate file that I can play without running your code.