PHYS2502 Mathematical Physics Lab #9 21 Mar 2022

This lab assignment is at 8am, the morning after the date shown, although you should able to complete it easily before the end of the lab period. When you're done, upload your executed MATHEMATICA *notebook to the Canvas page for the course.*

Create an animation which demonstrates that your solutions for Problem 2 of this week's homework assignment are correct.

Choose some waveform $g(z)$ that represents a localized pulse. A Gaussian is a simple closed form, but you can use the MATHEMATICA function Piecewise to make any shape you want.

Choose some length L of the visible string and wave velocity v, and plot the waveform over the range $0 \leq x \leq L$. Start your animation with the pulse at some distance well to the right, but not so far that you can't see the whole pulse on the plot. Then run the animation over times that show the pulse starting out, moving to the left, reflecting at $x = 0$, and returning to the right. You might find it simplest to use the time range $-T \leq t \leq T$ where $T = fL/v$ and f is the fraction of L where you start the animation.

You are making two animations, one for the solution when the string is fixed at $x = 0$, and one where the end at $x = 0$ is allowed to float but keeps the slope at zero.

Don't forget to set the PlotRange appropriately so that you see the whole pulse all the way through the animation.