Jervis Muindi Wednesday, April 10, 2013
Numerical Analysis and Algorithms
Homework 7

Homework 7 Readme

Introduction

This package is a python script that solves the model problem for a vibrating string.

Dependencies

You should make sure that you have both Python 2.7+ and Matplotlib library installed in order to make use of this program.

In case Matplotlib is not installed, I have included a pre-compiled version of the script for windows under the bin/windows folder.

How to Use

Usage:

python main.py [x-width] [t-width] [total_time] [graph_rate]

x-width : amount of x-spacing between points

t-width: delta in time to be applied in a single step forward

total_time: amount of time be used in simulating the system

graph_rate: A graph should be drawn/plotted every "graph_rate" steps

For example Example: python main.py 0.01 0.01 2 10

Note: 1) All input values should be positive numeric values.

2) Graphing ability and program execution is dependent on MatplotLib being installed

The program will save the graphs of the solution to the current working folder with files of name “graph[num].png” where “num” is a number.

Sample Run

Test Run 1

I ran the program on inputs:

x-width = 0.01

t-width = 0.01

total_time = 2

graph_rate = 10

Please see the folder “run1” which contains image files graph1.png to graph21.png for the sample output obtained from this simulation. This is output that was requested for in the homework.

Test Run 2

I did a second test run with a smaller graph-rate so that the transitions are seen more clearly. The inputs used were:

x-width = 0.01

t-width = 0.01

total_time = 2

graph_rate = 1

Please see the folder “run2” which contains image files graph1.png to graph201.png for the sample output obtained from this simulation.