Homework #8 Summary

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11/1/2016

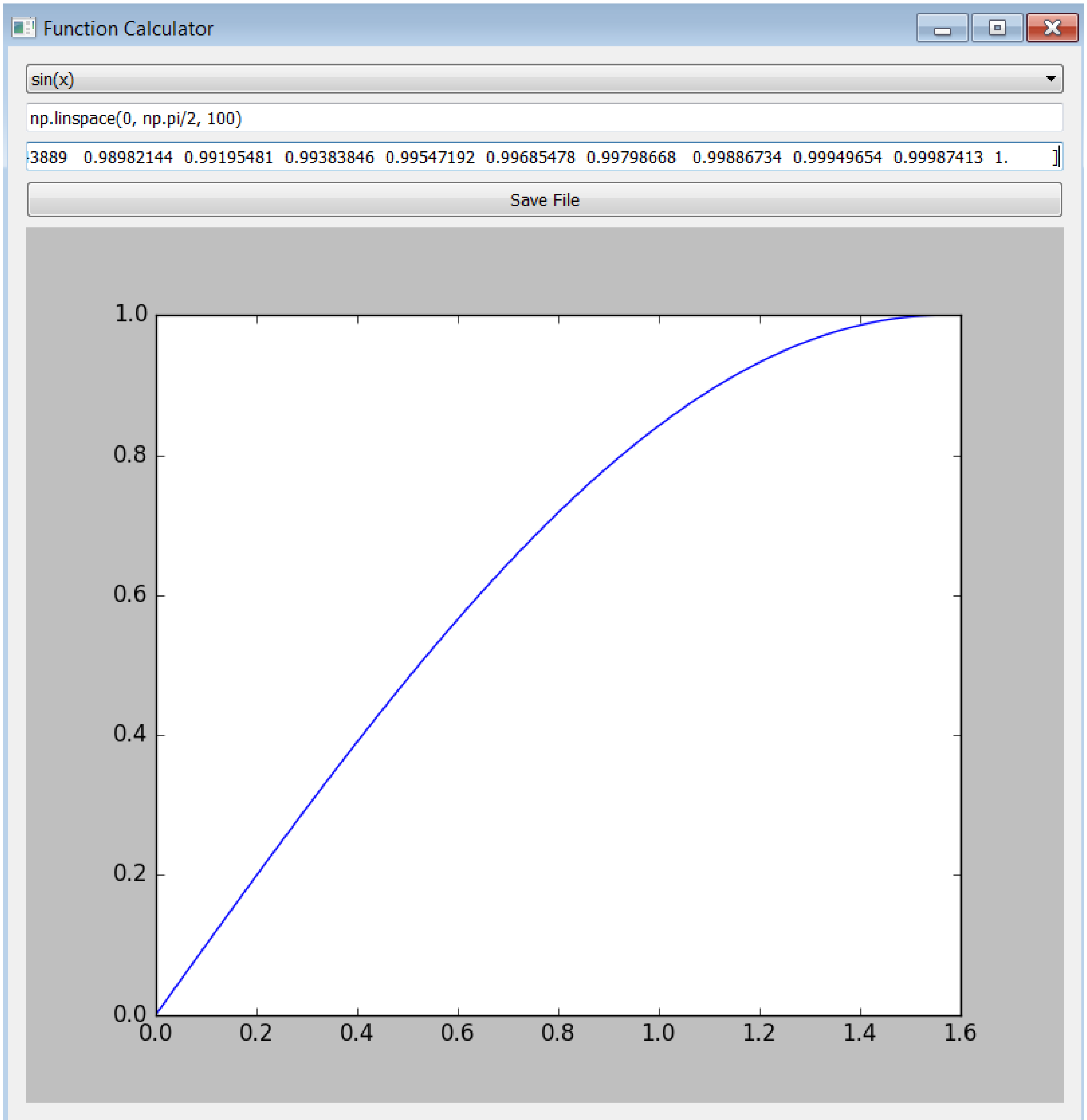
In the code I set the standard size for the GUI using setGeometry and gave the window a title using setWindowTitle. I then used a combo box to give the GUI a drop-down box of set functions to be solved, these standard functions added were sine, cosine, and tangent. Additionally I gave the GUI a drop-down setting for the user to enter a custom function of his/her choice. Next, I created a value input and an output box that would solve the function when the user selects the output box then presses the return key. Using QPushButton and MatplotlibCanvas I gave the GUI a save as button as well as graphical settings to be called in the MatplotlibCanvas class. The class MatplotlibCanvas will handle all of the plotting settings and axis labels. The order of these input boxes, graph, and button were decided using layout as QVBoxLayout. I then gave code to tell which definitions to call when the button is pressed or the function index is changed. When the button is pressed it calls a save definition which allows the user to give the output results a name and save them in the desired folder as a .txt file. When "custom" is selected for a function it will call the i definition which will check the index and change the settings to create an editable function. When the graph updates through the UpdateUI definition it checks to see if the desired values to be entered into the fuction is given as a tuple or list. If so it does the proper conversions to allow the values to be solved and outputted as an array of values and graph the data. The redraw function allows the graph to update when changing values or the function. Saving the data gives an organized list of values that could be helpful in many applications.

A screen clipping of the GUI solving for

f(x) = sin(x)
x = np.linspace(0, np.pi/2 , 100)

is seen on the next page.

A copy of the outputted text file will be shown on the third page



sin(x)

np.linspace(0, np.pi/2, 100)

```
3889  0.98982144  0.99195481  0.99383846  0.99547192  0.99685478  0.99798668  0.99886734  0.99949654  0.99987413  1.        ]
```

The Function sin(x)

The x Values np.linspace(0, np.pi/2, 100)

The y Values

```
[ 0.          0.01586596  0.03172793  0.04758192  0.06342392  0.07924996
  0.09505604  0.1108382   0.12659245  0.14231484  0.1580014   0.17364818
  0.18925124  0.20480667  0.22031053  0.23575894  0.25114799  0.26647381
  0.28173256  0.29692038  0.31203345  0.32706796  0.34202014  0.35688622
  0.37166246  0.38634513  0.40093054  0.41541501  0.42979491  0.44406661
  0.45822652  0.47227107  0.48619674  0.5         0.51367739  0.52722547
  0.54064082  0.55392006  0.56705986  0.58005691  0.59290793  0.60560969
  0.61815899  0.63055267  0.64278761  0.65486073  0.666769    0.67850941
  0.69007901  0.70147489  0.71269417  0.72373404  0.73459171  0.74526445
  0.75574957  0.76604444  0.77614646  0.78605309  0.79576184  0.80527026
  0.81457595  0.82367658  0.83256985  0.84125353  0.84972543  0.85798341
  0.8660254   0.87384938  0.88145336  0.88883545  0.89599377  0.90292654
  0.909632    0.91610846  0.92235429  0.92836793  0.93414786  0.93969262
  0.94500082  0.95007112  0.95490224  0.95949297  0.96384216  0.9679487
  0.97181157  0.97542979  0.97880245  0.9819287   0.98480775  0.98743889
  0.98982144  0.99195481  0.99383846  0.99547192  0.99685478  0.99798668
  0.99886734  0.99949654  0.99987413  1.        ]
```