ECE-351 Lab Report 3

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1 Introduction

In this lab, the goal was to use Python to learn more about convolution.

2 Methodology

```
def f1(t):
y = np.zeros(t.shape)
y = s(t-2) - s(t-9)
return y

    def f2(t):
y = np.zeros(t.shape)
y = s(t)*np.exp(-t)
return y

    def f3(t):
y = np.zeros(t.shape)
y = r(t-2)*s(t-2) - r(t-2)*s(t-3) + r(4-t)*s(t-3) - r(4-t)*s(t-4)
return y

    def conv(f1,f2):
Nf1 = len(f1)
Nf2 = len(f2)
f1E = np.append(f1, np.zeros((1,Nf2 - 1)))
f2E = np.append(f2, np.zeros((1,Nf1 - 1)))
result = np.zeros(f1E.shape)

    for i in range(Nf2+Nf1-2):
result[i] = 0
for j in range(Nf1):
if(i-j+1¿0):
result[i] = result[i] + (f1E[j]*f2E[i-j+1])

    return result
```

3 Results

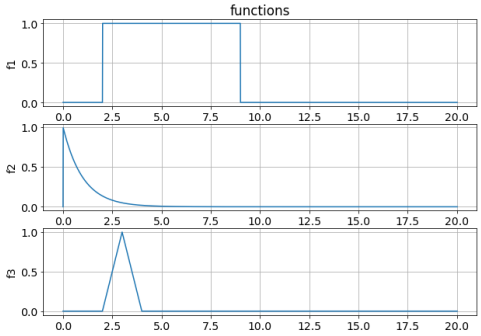

Figure 1:

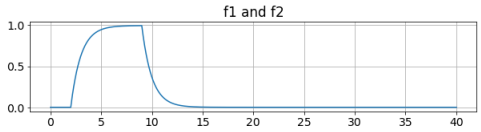

Figure 2:

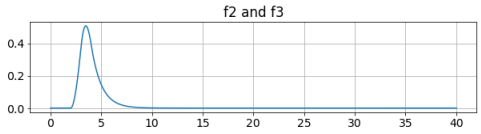

Figure 3:

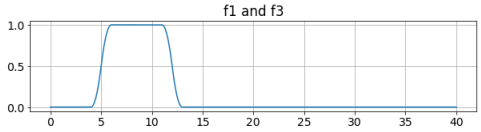

Figure 4:

4 Error Analysis

The only problem occurred when the user-defined convolution function was being written. The code was not working and it was not clear as to why it wasn't. To solve the problem, the advanced technique "I don't know why this isn't working so I'm going to make several small changes around the error until it works" was implemented.

5 Questions

1. Did you work alone or with classmates on this lab? If you collaborated to get to the solution, what did that process look like?

This Lab was worked on alone.

2. What was the most difficult part of this lab for you, and what did your problem-solving process look like?

Part 2, Task 1.

3. Did you approach writing the code with analytical or graphical convolution in mind? Why did you chose this approach?

6 Conclusion

The lab was completed while successfully using Python to create convolution graphs.
https://github.com/Celevia