

Introduction to Programming EE2310 Homework 3

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Problem

Write a program to generate a function and add a sinusoidal wave to it. Try to filter out the wave by using the way of recursive in the end.

My Solution

Use a `for` loop to calculate items in every number of columns one time. Loop again to calculate the next item.

Additional Features

None.

Program Flow & Structure

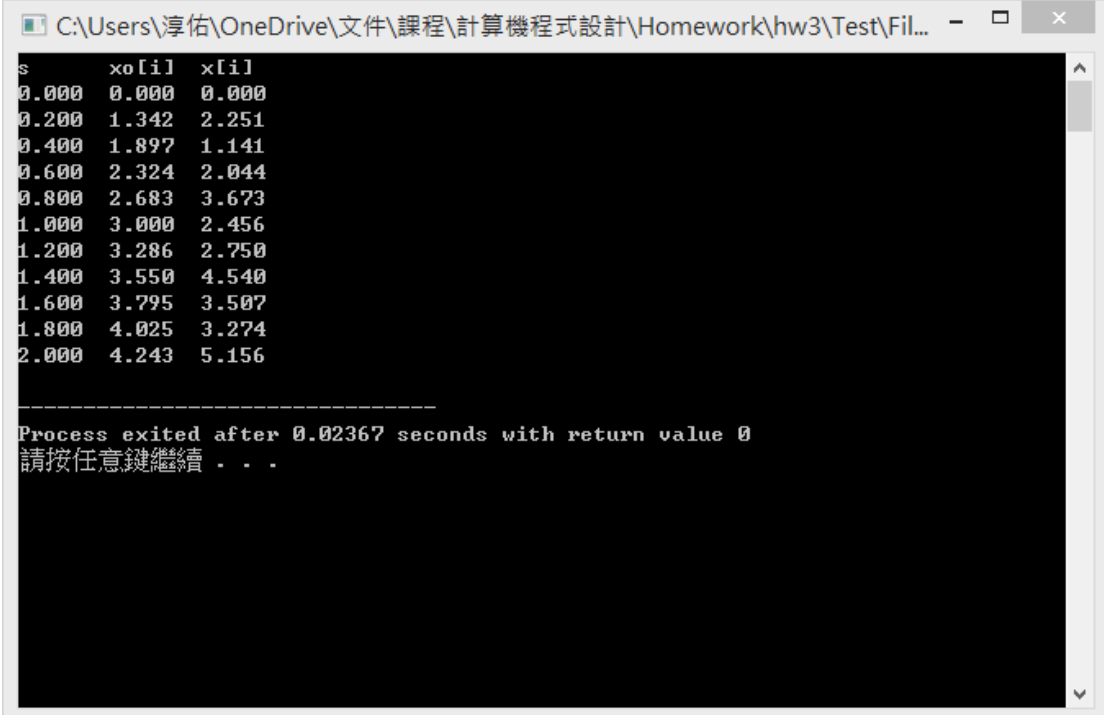
LINE	
09~12	1) Define variables, open the target file.
14~15	2) Print out (also save to file) the column headings.
17~27	3) <div><div>for</div><div><div>1) Set <code>s</code>.</div><div>2) Calculate <code>xo</code>, <code>x</code>, <code>xn</code>, <code>yo</code>, <code>y</code>, <code>yn</code> respectively by using <code>s</code> and other variables.</div><div>3) Print <code>s</code>, <code>xo</code>, <code>x</code> to the screen.</div><div>4) Save all the variables above to the .csv file.</div></div></div>
30	4) Close the target file.

Discussions

- Is it necessary to use arrays to save the variables?
>> I don't think so. Every time the program loop again, the value of the variables will still same as the value of the previous loop, on the same meaning as "n[i-1]". Just assign 0 to every variables in the beginning of the program for the first time of the loop.
- Why is the graphic looked like this? Why are y[i] and yo[i] similar?
>> In the beginning, we add a sinusoidal wave to my own function (xo[i]). This makes the graphic of x[i] goes up and down when the graphic of xo[i] is still smooth. By using the technique of recursive, we can achieve the effect similar to **destructive interference**, and the wave that has been added the sinusoidal wave will be almost the same as the original one, that's why the line of y[i] and yo[i] looks so similar.

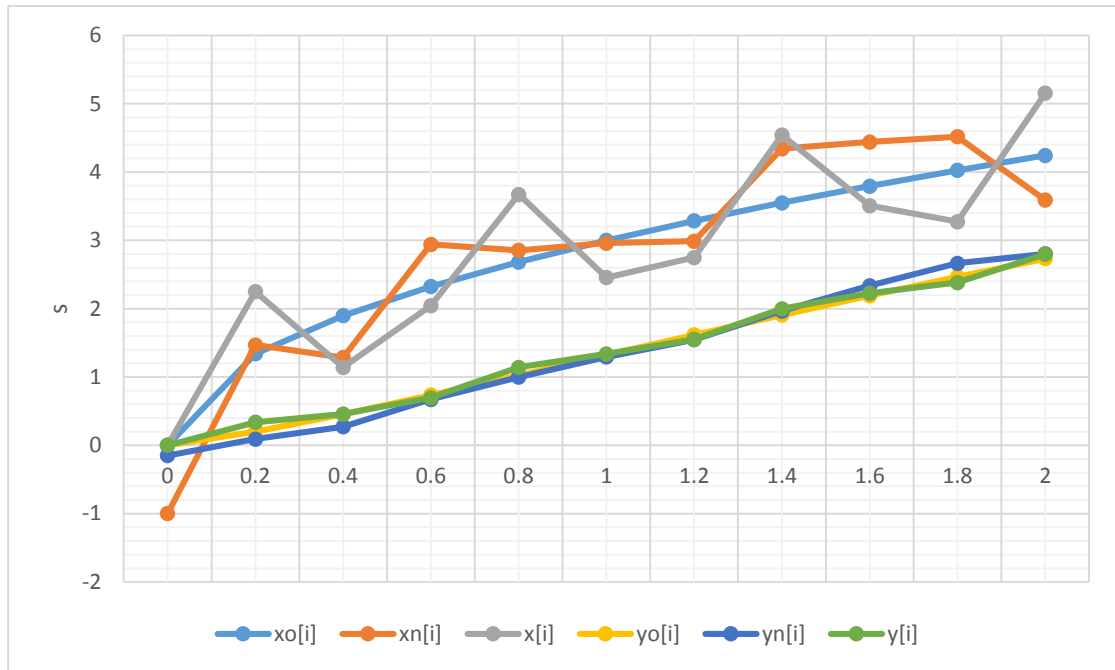
Output Result

My own function: $3 \times \sqrt{s}$



```
C:\Users\淳佑\OneDrive\文件\课程\计算机程序设计\Homework\hw3\Test\Fil...
s      xo[i]  x[i]
0.000  0.000  0.000
0.200  1.342  2.251
0.400  1.897  1.141
0.600  2.324  2.044
0.800  2.683  3.673
1.000  3.000  2.456
1.200  3.286  2.750
1.400  3.550  4.540
1.600  3.795  3.507
1.800  4.025  3.274
2.000  4.243  5.156

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Process exited after 0.02367 seconds with return value 0
请按任意键继续 . . .
```



p.s. Please check Result.csv in the homework folder for a more detailed result.