

Homework L^AT_EXTemplate

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1 Solution to Problem 1.a

Indeed, problem 1.a assigned based on some paper[1] does not really exist, but it is a good example of how to cite and reference a paper in an assignment.

2 Solution to Problem 7.1

Sometimes you will need to show your mathematical work using equations. Suppose that you want to explain the way the element of a matrix that is the product of two others, say A and B , at row i and j -th column, then you would probably express that in an equation like this:

$$c_{ij} = \sum_{k=1}^m a_{ik}b_{kj} \quad (1)$$

You can also reference back to Eq. (1) to say that c_{ij} is the element at any given point in the product matrix C .

2.1 Code

If you are asked to show your code, you could use a sub-section like this, and show your code. Here is a way you could do it:

```
import numpy as np

a = [[1, 0], [0, 1]]
b = [[4, 1], [2, 2]]

print np.dot(a, b)

print np.cross(a, b)
```

However, note that this code is bad; it is a **poorly documented** python script. But if in the last page you will find a good example. Anyway, here is how you could show the results that your script gives in command line:

```
> python hw1.7.1.py
[[4 1]
 [2 2]
 [1 -2]]
```

and there it is, the magic of Python and numpy.

3 Problem 9.1

Let us also use a sample table. As shown in Table 1 I have some basketball teams I like. And they can be represented in a floating table.

Table 1: Some of my favorite teams

Team	P	W	D	L	F	A	Score
Lakers	6	4	0	2	10	5	12
Heat	6	3	0	3	8	9	9
Knicks	6	2	1	3	7	8	7
Spurs	6	2	1	3	5	8	7

4 Problem A.1

Finally lets include a figure produced by some python and matplotlib. The following python code down below produced Figure 1.

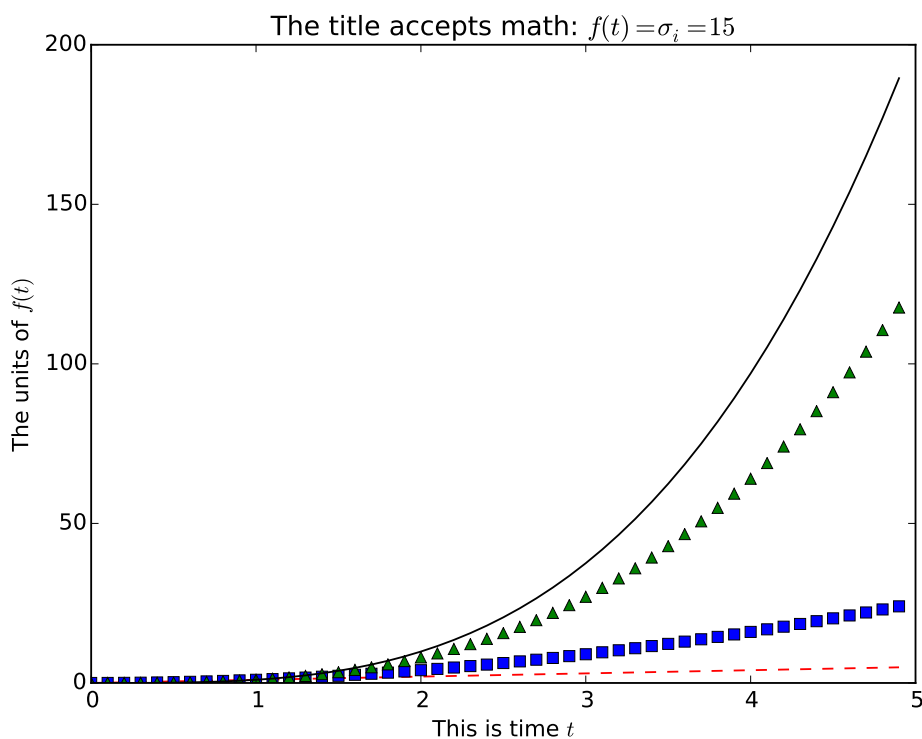


Figure 1: The derivative of $f(x) = 1 - x^2$ at $x = .5$ converging to -1 as $h \rightarrow 0$, would be a good example of a good figure caption.

The name of the file is `hw0.plotme.py` and this should be considered as a model of a well-documented python program. All your files should have the same header format as in this file. That is, each python program must have a block comment at the top which gives the name of the file, the student's name, the assignment, the date, the version, and a comment about what is contained in the file. Be concise but precise in your comments. Look at the example that produced the figure previously mentioned:

```

# file: driver.py
# author: Dr. Pablo Rivas
# version: 1.0
# date: Aug/5/2016
#
# This file shows how to create a simple plot in python
# using the well-known matplotlib package.

import numpy as np
import matplotlib.pyplot as plt

# Creates an evenly sampled time array at 100ms intervals
t = np.arange(0., 5., 0.1)

plt.plot(t, t, 'r—')      # Uses red dashes for t
plt.plot(t, t**2, 'bs')   # Uses blue squares for t^2
plt.plot(t, t**3, 'g^')   # Uses green triangles for t^3
plt.plot(t, t**3.3, 'k-') # Uses black line for t^3.3

# Example axis legends title
plt.xlabel(r'This is time_$t$')
plt.ylabel(r'The units of_$f(t)$')
plt.title(r'The title accepts_math:_$f(t)=\sigma_i=15$')

# Saves the figure into a .pdf file (desired!)
plt.savefig('hwplot.pdf', bbox_inches='tight')
plt.show()

```

5 Conclusions

Feel free to modify this template to suit the needs of what you need to report in your assignments for this class. If you detect a typo or any other error, please report it to me.

References

- [1] Huynen, M. A. and Bork, P. 1998. Measuring genome evolution. *Proceedings of the National Academy of Sciences USA* 95:5849–5856.