

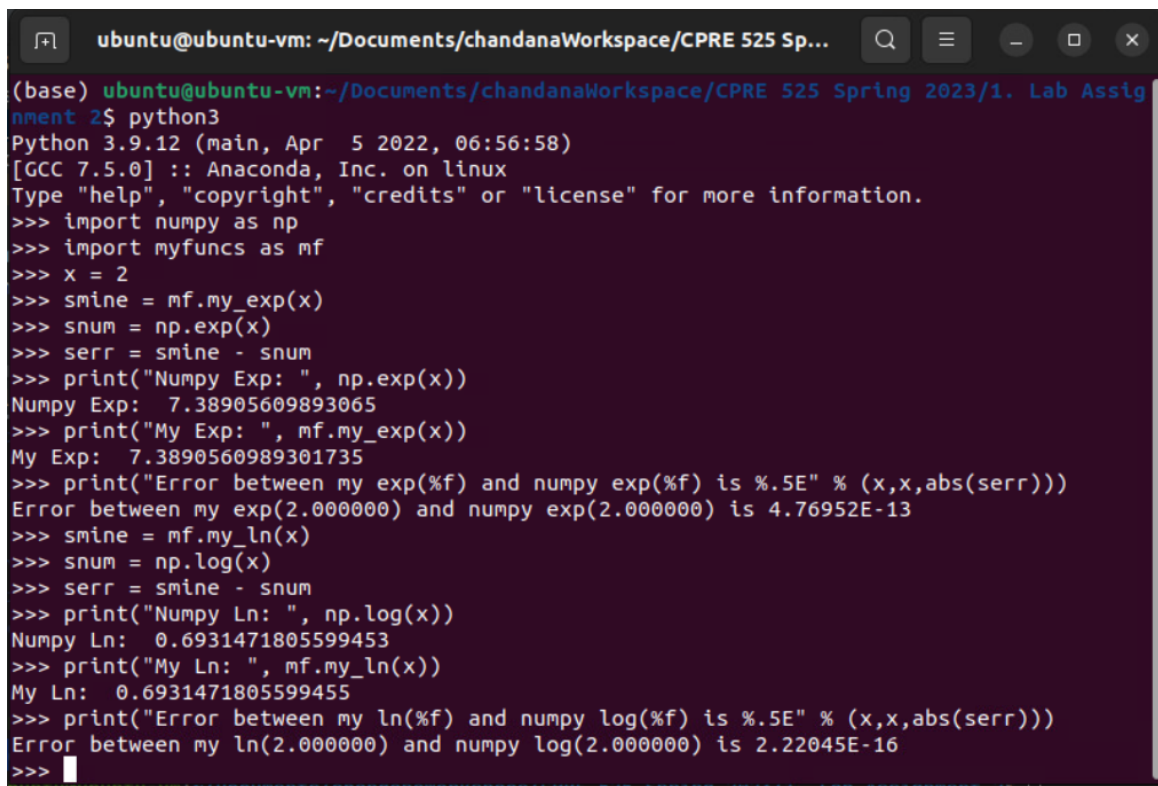
Lab Assignment 2
Saichandana V (vsc@iastate.edu)

Tasks:

1. Develop a module with name myfuncs.py that includes the two functions discussed in lecture02. (Submit your code)
2. Run tests with comparison to numpy functions through Python prompt (Submit screen shots)
3. Develop a Python script with name demo_myfuncs.py that perform the same tests, run it on terminal (Submit both code and screen shots)

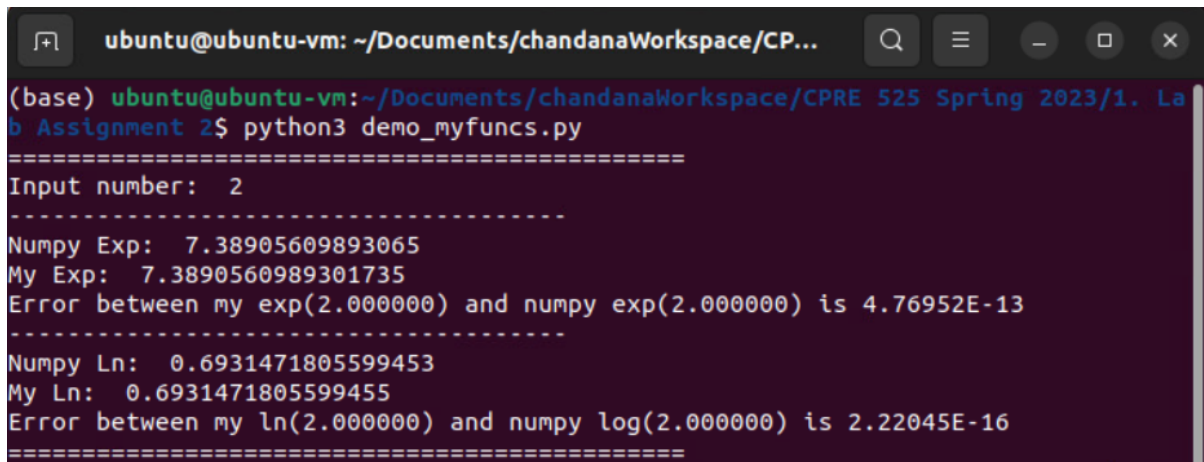
Submission Files and Results:

1. I developed a module with the name myfuncs.py that includes the two functions (i) my_exp: exponential function with Taylor series, and (ii) my_ln: natural logarithm function with newton's method using the my_exp function. I submitted the myfuncs.py along with this file.
2. Ran tests with comparison to NumPy functions through Python prompt for x=2 example. Here is the screenshot for the execution.



```
ubuntu@ubuntu-vm: ~/Documents/chandanaWorkspace/CPRE 525 Sp...
(base) ubuntu@ubuntu-vm:~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/1. Lab Assignment 2$ python3
Python 3.9.12 (main, Apr  5 2022, 06:56:58)
[GCC 7.5.0] :: Anaconda, Inc. on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import numpy as np
>>> import myfuncs as mf
>>> x = 2
>>> smine = mf.my_exp(x)
>>> snum = np.exp(x)
>>> serr = smine - snum
>>> print("Numpy Exp: ", np.exp(x))
Numpy Exp:  7.38905609893065
>>> print("My Exp: ", mf.my_exp(x))
My Exp:  7.3890560989301735
>>> print("Error between my exp(%f) and numpy exp(%f) is %.5E" % (x,x,abs(serr)))
Error between my exp(2.000000) and numpy exp(2.000000) is 4.76952E-13
>>> smine = mf.my_ln(x)
>>> snum = np.log(x)
>>> serr = smine - snum
>>> print("Numpy Ln: ", np.log(x))
Numpy Ln:  0.6931471805599453
>>> print("My Ln: ", mf.my_ln(x))
My Ln:  0.6931471805599455
>>> print("Error between my ln(%f) and numpy log(%f) is %.5E" % (x,x,abs(serr)))
Error between my ln(2.000000) and numpy log(2.000000) is 2.22045E-16
>>>
```

3. Developed a Python script with the name demo_myfuncs.py that performs the same tests for the $x=2$ example, and ran it on the terminal. Here is the screenshot for the execution.



```
(base) ubuntu@ubuntu-vm: ~/Documents/chandanaWorkspace/CPRE 525 Spring 2023/1. Lab Assignment 2$ python3 demo_myfuncs.py
=====
Input number: 2
-----
Numpy Exp: 7.38905609893065
My Exp: 7.3890560989301735
Error between my exp(2.000000) and numpy exp(2.000000) is 4.76952E-13
-----
Numpy Ln: 0.6931471805599453
My Ln: 0.6931471805599455
Error between my ln(2.000000) and numpy log(2.000000) is 2.22045E-16
=====
```