PHYS-4007/5007: Computational Physics Course Lecture Notes Appendix C

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Abstract

These class notes are designed for use of the instructor and students of the course PHYS-4007/5007: Computational Physics taught by Dr. Donald Luttermoser at East Tennessee State University.

Appendix C.   Scientific Computing Using Python

A. Tutorial Introduction to Python

1. I encourage all of you to visit the official website for *Python* at https://www.python.org/ and review the documentation relating to *Python* at https://docs.python.org/. There are two main versions of Python that are currently available (as of fall 2025).

   a) Python 2 (latest edition is Python 2.7.10).

   b) Python 3 (latest edition is Python 3.13.6).

   c) Note that Python 3 is backward compatible with Python 2, but Python 2 will not be able to handle code written in Python 3.

   d) This appendix is based on information contained at the Python documentation website.

2. Here is a typical first Python program: It print the words "hello, world!" on the screen.

```
# This program prints 'hello world! to the terminal.
# Lines starting with the pound sign '#' are comments in Python.
#    Filename should be:  hello.py
#    Created on 8/27/2015 by D.G.L.
#
print("hello world!")
input("\n\nPress the Enter key to exit.")
```

   a) One would place these lines in a file called *hello.py* while in a text editor.

   b) Comments start with the pound (#) symbol. It's always a good idea to include comments of what the code does, who wrote it, and the date it was written near the beginning of the code.

c) The print( ) command prints whatever is located in the parentheses — here we are printing a string located within the double quotes.

d) The input( ) command print the text located in the double quotes and waits for the user to press the 'Enter' key on the keyboard before exiting the program.

e) \n represents a single character — neccessary, since typing the <return> key in the middle of a string is not really practical! Other control characters are: \t = tab, \a = alert bell, \" = double quote, \r = carriage return, \\ = backslash itself!

f) Unlike the C programming language, Python inserts automatically inserts a newline character (\n) at the end of the data being printed in the print( ) and the input( ) commands.

g) You will note that one does not need to include a stop or end command at the end of a Python program.

3. Note that like C, and unlike Fortran and IDL, Python is case sensitive! As such, whereas print( ) will work, Print( ) or PRINT( ) will not work.

4. There is a very good web site for beginning users of Python at https://www.python.org/about/gettingstarted/ — please access this web page to learn how to use Python. Note in this course, we will be using Python 3.