

Homework Assignment #3 – Python II and File Fundamentals

Practical Cyber Security Fundamentals (CTF), Spring 2017
Department of Computer Science, Florida State University

Points: 30

Due: Beginning of the class (5:15pm) on February 13, 2017

Submission: You need to submit electronically via Blackboard by uploading a text file (named “hw3-Firstname-Lastname.txt”) for your answers and programs to the problems; you need to combine all the parts into a single file. Here replace “Firstname” using your first name and replace “Lastname” using your last name in the file name.

The main purpose of this assignment is to let you be familiar and become comfortable with binary files by understanding general data types and file magics and be able to develop more advanced Python scripts and programs for (binary) file analysis and networking. You need to show your work in order to receive full credit.

Problem 1 (15 points) Create or download the simple text file first (available from <http://www.cs.fsu.edu/~liux/courses/ctf/assignments/simple-text.txt>):

```
0123456789  
ABCDEFGHIJKLMN OPQRSTUVWXYZ  
abcdefghijklmnopqr stuvwxyz
```

Then you need to add a proper header so that the file will be reported as each of the following types by program “file”:

- 1) “PE32+ executable (console) x86-64, for MS Windows”
- 2) “ELF 32-bit LSB executable”
- 3) “JPEG image data, JFIF standard 1.01”
- 4) “PDF document, version 1.5”
- 5) “Zip archive data”

For each file format, you need to include its binary content using “hexdump -C file-name” and the output from program “file” in the file to be submitted.

For the following two problems, you need to solve for the flag.

Problem 2 (15 points) We need some change in 2017 - nc 104.236.253.250 31337

Problem 3 (15 points) The robots have taken over! Help us decrypt their communications. We have analyzed their positronic code and determined that their encryption scheme depends on using a custom base64 encoding, then using an xor, then a rotation cipher. - nc 104.236.253.250 8123

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