

10–28–14 CSE 4243/6243 Homework 3 - Developing a Filter

Introduction

In this lab, you will develop a simple proof-of-concept filter for blocking network traffic as a Python module. Since it is a proof-of-concept, it will be limited to blocking traffic for a function built into the same module.

Your module will manage addition and removal of IP addresses to and from the block list, as well as provide a facility for making a simple web request to the a target host. The web request will be allowed if it is not on the block list (and will be successful if there is a web server running on the target host). The web request will be blocked if the target host is on the block list.

Requirements

- You are required to use the latest version of either Python 2.x or 3.x
- You must implement the functionality of your submission in a Python module, named `hw3filter.py`, that can be imported and used by another Python program
 - This is part of how your submission will be tested
- Your module will maintain a persistent “blacklist” of blocked hosts
 - Meaning: the list of blocked hosts should maintain its state even if the program importing the module exits and restarts unexpectedly
- Your module is expected to provide the following functions:
 - `add_host`
 - Accepts a string consisting of an IP address.
 - Returns nothing
 - Adds the host to the persistent blacklist
 - If the host is already on the list, it should raise a `StandardError` exception describing the problem
 - `remove_host`
 - Accepts a string consisting of an IP address.
 - Returns nothing
 - Removes the host from the persistent blacklist
 - If the host is not on the list, it should raise a `StandardError` exception describing the problem
 - `get_blacklist`
 - No arguments
 - Returns a Python list of strings that represents the current state of the persistent blacklist
 - `get_web_index`
 - Accepts a string consisting of an IP address.
 - Returns HTML text of the page at the web root of that host.

- This function will check the blacklist to see if the host provided is blocked. If the host is blocked, then it should raise a `StandardError` exception describing the issue .
- If the host provided is not blocked, then this function should issue a request for the web page located at `http://<host>/`
- If there is no web page at that location, or some other error occurs while issuing the request, the string "No Page" should be returned. No exception should be raised back to the calling function in this case.
- If the request is successful, and a page is retrieved, a string representing the text of the HTML of that page should be returned to the calling function.
- Your deliverables include:
 - The code for your module, meeting the above requirements
 - Code for the Python program you used to test for correct operation of the module
 - A professional-looking report that includes a discussion of your design and implementation of the module, and documentation of your testing.
- Your submission is due by Friday, October 31st, 5:00PM

Academic Integrity

Homework assignments in this class are strictly individual work. Do not discuss any aspect of this assignment with fellow students. Assignments will be checked for evidence of plagiarism. Use and cite resources appropriately.

You are only allowed to refer to the official Python documentation available at <https://www.python.org/doc/> for assistance in completing this assignment. The Tutorial, Library Reference, and Language Reference available there provide sufficient documentation of everything needed to complete the work. If it is determined that your code is based on or written while consulting another site (such as, but not limited to, StackExchange), you will receive a zero for the assignment, even if it is cited correctly.

Grading (*points for not following instructions taken off of the grade determined by this scheme*)

- 10% - Spelling, grammar, appropriate technical writing style. Avoid conversational/informal tone.
- All students are encouraged to seek (and acknowledge) writing and proofreading assistance from one of the university's writing centers.
- 10% - Professional formatting, organization of your document
- 60% - Meeting the requirements for the required Python module
- 20% - Documentation of testing of the module's functionality