Tanya Gonzalez
Updating a file through a Python algorithm
September 2023

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Project description

An allow list of IP addresses is used at my company to manage access to content that is forbidden. These IP addresses are identified in the "allow_list.txt" file. The IP addresses that ought to be blocked from accessing this content are listed in a separate delete list. I developed an algorithm to automatically remove these IP addresses that shouldn't be able to access the "allow_list.txt" file and update it.

Open the file that contains the allow list

First, I opened the "allow_list.txt" file to begin the algorithm. Initially, I put this file name in the import_file variable as a string:

```
# Assign `import_file` to the name of the file

import_file = "allow_list.txt"
```

Then, I used a with statement to open the file:

```
# Build `with` statement to read in the initial contents of the file

with open(import_file, "r") as file:
```

The allow list file is opened for reading in my algorithm by using the with statement and the read-only.open() function. I'm accessing the file so I may access the IP addresses that are kept in the allow list file. By exiting the with statement and closing the file, the with keyword will aid in resource management. Two parameters are passed to the open() function in the code that uses open(import_file, "r") as file:. The first specifies which file has to be imported, and the second tells me what I want to do with it. "r" in this instance denotes my want to read it. The code also uses the as keyword to assign a variable named file; file stores the output of the .open() function while I work within the with statement.

Read the file contents

In order to read the file contents, I used the .read() method to convert it into the string.

```
with open(import_file, "r") as file:

  # Use `.read()` to read the imported file and store it in a variable named `ip_addresses`

  ip_addresses = file.read()
```

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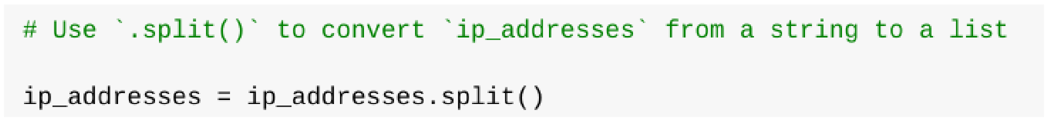
I can call the.read() method in the body of the with statement when I use an.open() function that takes the argument "r" for "read." I can read the file by converting it to a string using the.read() method. I used the with statement's file variable to apply the.read() method. I then set the variable ip_addresses to contain the textual output of this procedure.

To put it briefly, this code reads the data from the "allow_list.txt" file and converts it into a string format that I can use in my Python application to organize and extract data.

Convert the string into a list

In order to remove individual IP addresses from the allow list, I needed it to be in list format. Therefore, I next used the .split() method to convert the ip_addresses string into a list:



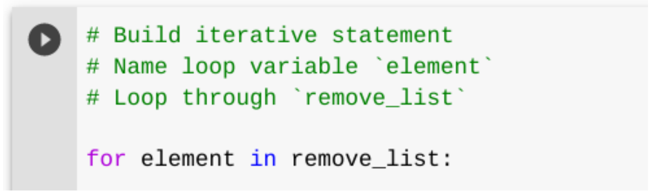
```
# Use `.split()` to convert `ip_addresses` from a string to a list

ip_addresses = ip_addresses.split()
```

By appending the.split() function to a string variable, it can be called. It functions by turning a string's contents into a list. To make removing IP addresses from the allow list simpler, ip_addresses has been divided into a list. The.split() function divides text by whitespace into list elements by default. The data kept in the variable ip_addresses, which is a string of IP addresses separated by whitespace, is sent into the.split() function in this algorithm, which turns it into a list of IP addresses. I returned this list to the variable ip_addresses in order to store it.

Iterate through the remove list

A key part of my algorithm involves iterating through the IP addresses that are elements in the remove_list. To do this, I incorporated a for loop:



```
# Build iterative statement
# Name loop variable `element`
# Loop through `remove_list`

for element in remove_list:
```

Python for loop repeats code for a given sequence. In a Python method such as this one, the for loop's main goal is to apply particular code instructions to each element in a series. The for loop is started with the for keyword. The keyword in and the loop variable element come next. The keyword instructs the loop variable element to assign each value as it iterates through the series of IP addresses.

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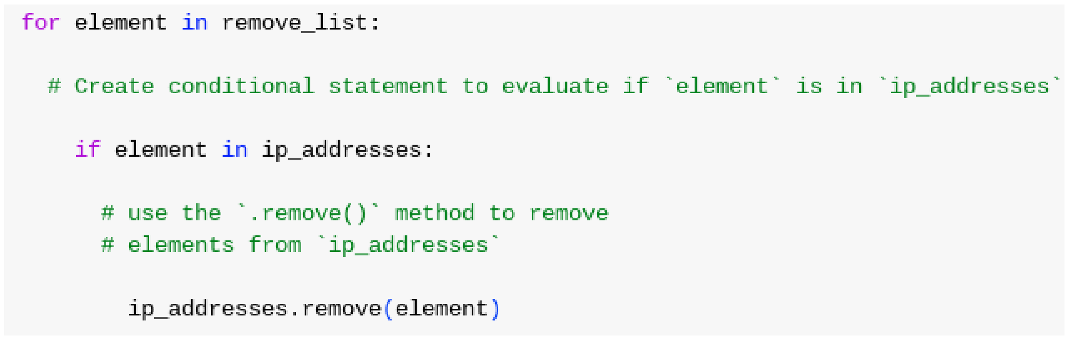
Remove IP addresses that are on the remove list

Any IP address that appears in remove_list and the allow list, ip_addresses, must be removed according to my method. I could use the following code to accomplish this because ip_addresses did not contain any duplicates:



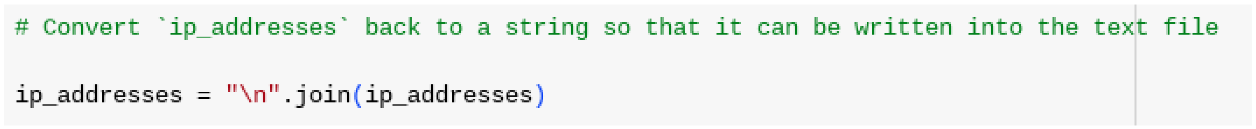
```
for element in remove_list:

  # Create conditional statement to evaluate if `element` is in `ip_addresses`

    if element in ip_addresses:

      # use the `.remove()` method to remove
      # elements from `ip_addresses`

        ip_addresses.remove(element)
```

I started by adding a conditional to my for loop to determine whether the loop variable element could be found in the ip_addresses array. I took this action since.remove() would fail when used on components that weren't located in ip_addresses.

After that, I applied.remove() to ip_addresses inside of the conditional. To ensure that every IP address in the remove_list was eliminated from ip_addresses, I supplied the loop variable element as an argument.

Update the file with the revised list of IP addresses

I had to update the allow list file with the updated list of IP addresses as the last stage in my method. I have to first turn the list back into a string in order to accomplish this. For this, I employed the.join() method:



```
# Convert `ip_addresses` back to a string so that it can be written into the text file

ip_addresses = "\n".join(ip_addresses)
```

An iterable's components are all combined into a string using the join() method. When a string is joined together, the characters in the string that make up the iterable's elements are separated using the.join() method. In this approach, I created a string from the list of IP addresses using the join() function so that I could provide it as an argument to the write() method and write to the "allow_list.txt" file. I used the string ("\n") as the separator to instruct Python to place each element on a new line.

Then, I used another with statement and the .write() method to update the file:

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```
# Build `with` statement to rewrite the original file

with open(import_file, "w") as file:

  # Rewrite the file, replacing its contents with `ip_addresses`

  file.write(ip_addresses)
```

This time, I used the open() method in my with statement with a second argument of "w". I want to open a file so I can write over its contents, as this argument suggests. I can invoke the.write() function in the with statement's body by utilizing this parameter, "w". The.write() function replaces any existing file content and writes string data to a given file.

In this instance, I intended to send the updated allow list to the "allow_list.txt" file in the form of a string. In this manner, any IP addresses that were taken off the allow list will no longer be able to access the restricted content. To rewrite the file, I appended the .write() function to the file object file that I identified in the with statement. I passed in the ip_addresses variable as the argument to specify that the contents of the file specified in the with statement should be replaced with the data in this variable.

Summary

I developed an algorithm that eliminates IP addresses from the "allow_list.txt" file of permitted IP addresses that are found in a remove_list variable. This algorithm read the file, converted it to a string that could be read, and then turned the string into a list that was kept in the ip_addresses variable. After that, I went through each IP address in remove_list one by one. I determined whether the element was included in the list of IP addresses with each iteration. If so, I removed the element from ip_addresses using the.remove() method. Subsequently, I employed the.join() function to transform the IP addresses back into a string, enabling me to append the updated list of IP addresses to the "allow_list.txt" file's contents.