Algorithm for file updates in Python

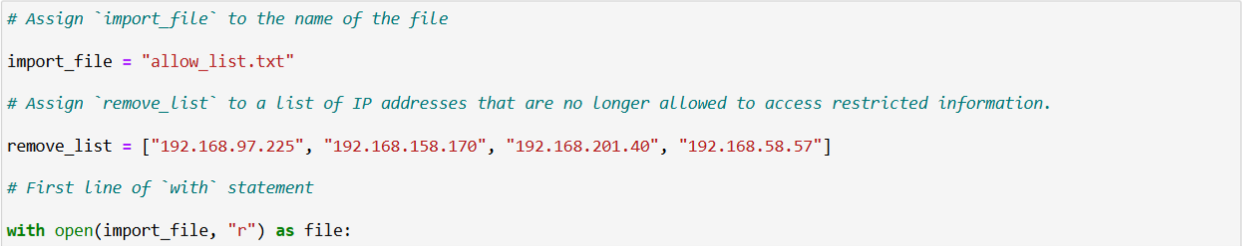
Project description

In this project, I created a Python program that updates a list of allowed IP addresses by removing those that should no longer have access. The program reads a file containing the allow list, checks it against a remove list, and updates the file by removing the restricted IP addresses. This ensures that only authorized users can access sensitive data.

Open the file that contains the allow list

I used the `open()` function with a `with` statement to open the file safely. This method automatically closes the file when done.

```
import_file = "allow_list.txt"
with open(import_file, "r") as file:
   ip_addresses = file.read()
```



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# Assign `import_file` to the name of the file

import_file = "allow_list.txt"

# Assign `remove_list` to a list of IP addresses that are no longer allowed to access restricted information.

remove_list = ["192.168.97.225", "192.168.158.170", "192.168.201.40", "192.168.58.57"]

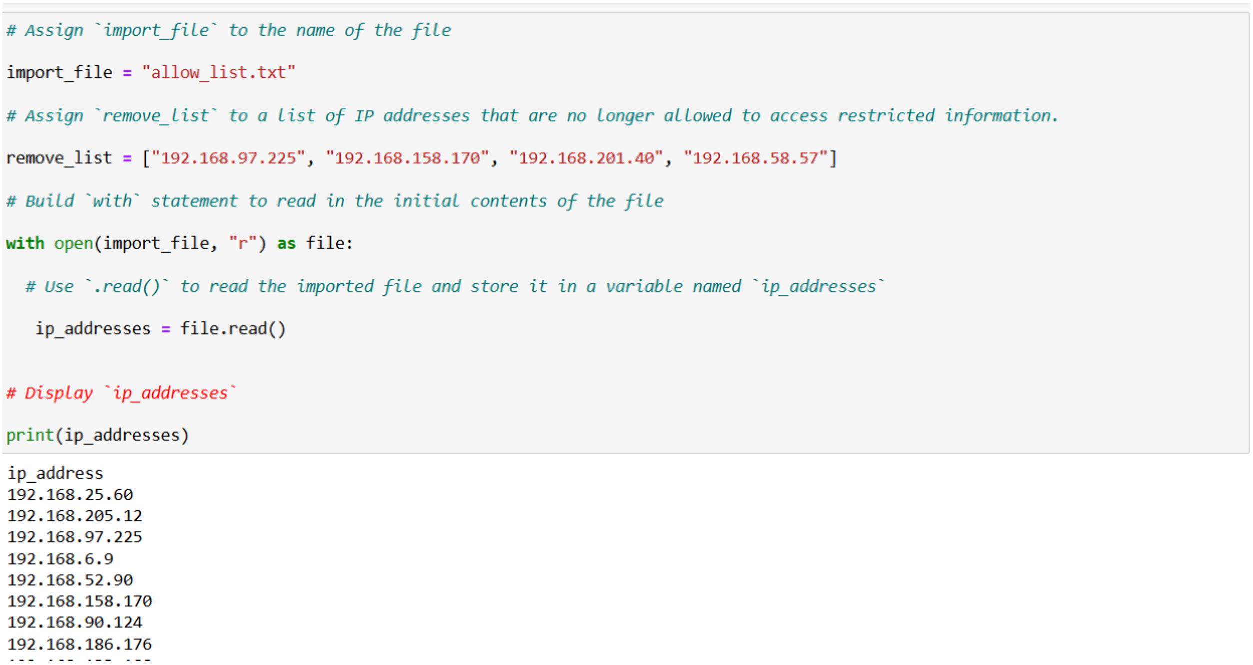
# First line of `with` statement

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

Read the file contents

The `.read()` method reads the entire file and stores its contents as a string.

```
ip_addresses = file.read()
```



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

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()

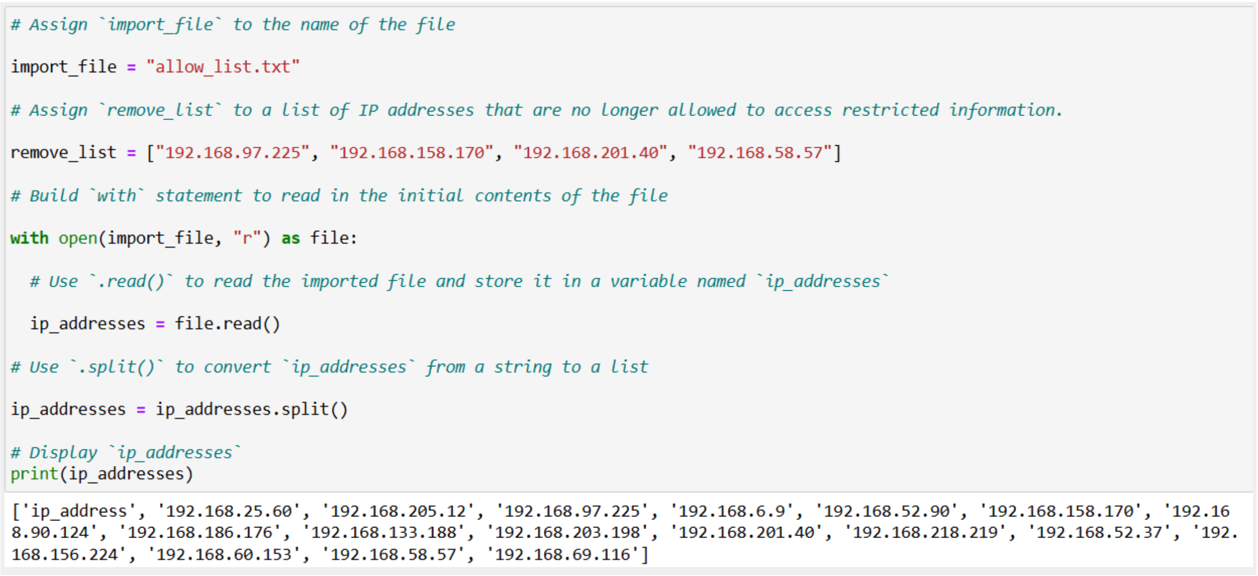

# Display `ip_addresses`

print(ip_addresses)
```

```
ip_address
192.168.25.60
192.168.205.12
192.168.97.225
192.168.6.9
192.168.52.90
192.168.158.170
192.168.90.124
192.168.186.176
```

Convert the string into a list

The `.split()` method converts the string into a list, making it easier to remove specific IP addresses.



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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()

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

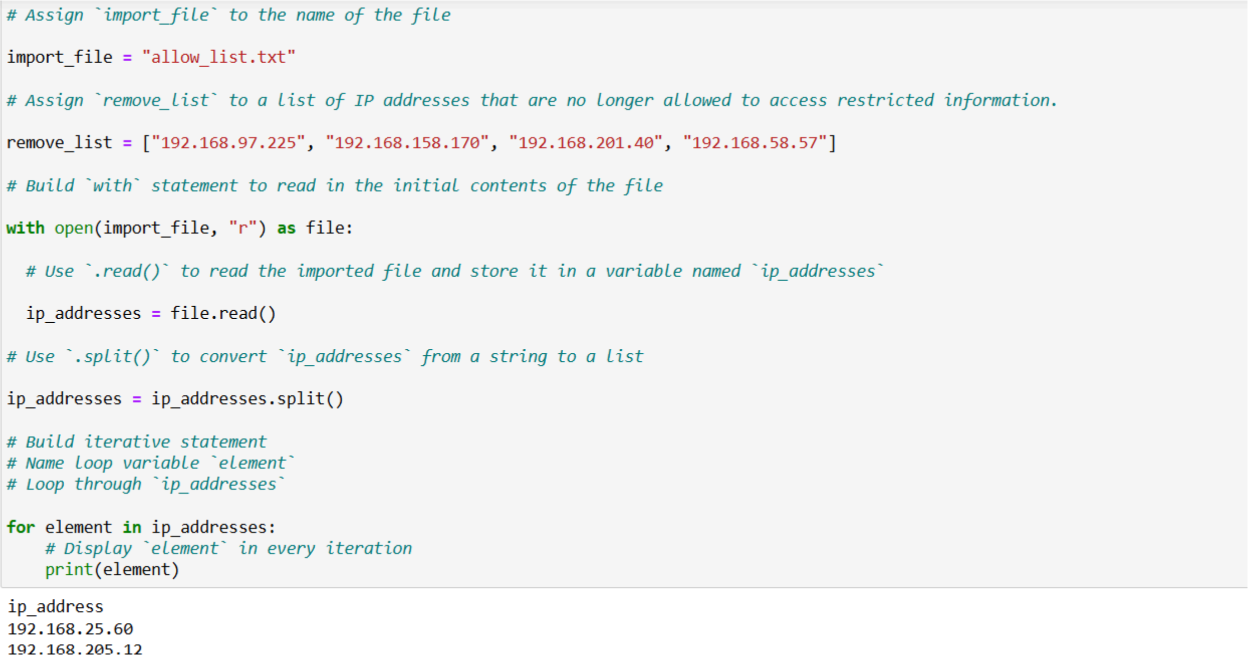
ip_addresses = ip_addresses.split()

# Display `ip_addresses`
print(ip_addresses)
```

```
['ip_address', '192.168.25.60', '192.168.205.12', '192.168.97.225', '192.168.6.9', '192.168.52.90', '192.168.158.170', '192.16
8.90.124', '192.168.186.176', '192.168.133.188', '192.168.203.198', '192.168.201.40', '192.168.218.219', '192.168.52.37', '192.
168.156.224', '192.168.60.153', '192.168.58.57', '192.168.69.116']
```

Iterate through the remove list

A for loop goes through each IP in the remove list to check if it is in the allow list.



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

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()

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

ip_addresses = ip_addresses.split()

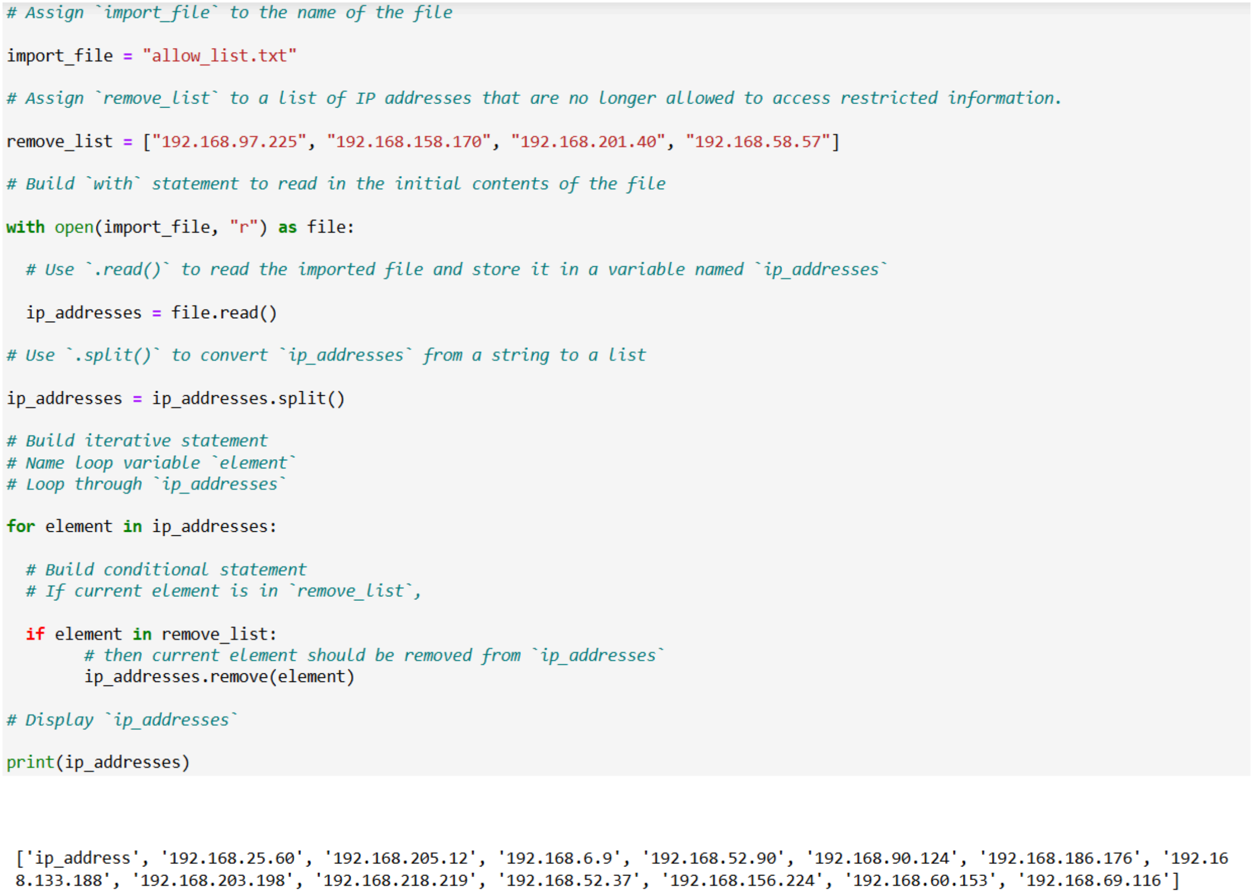
# Build iterative statement
# Name loop variable `element`
# Loop through `ip_addresses`

for element in ip_addresses:
    # Display `element` in every iteration
    print(element)
```

```
ip_address
192.168.25.60
192.168.205.12
```

Remove IP addresses that are on the remove list

The .remove() method is used to delete IPs from the allow list if they are in the remove list.



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

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()

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

ip_addresses = ip_addresses.split()

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

for element in ip_addresses:

  # Build conditional statement
  # If current element is in `remove_list`,

  if element in remove_list:
        # then current element should be removed from `ip_addresses`
        ip_addresses.remove(element)

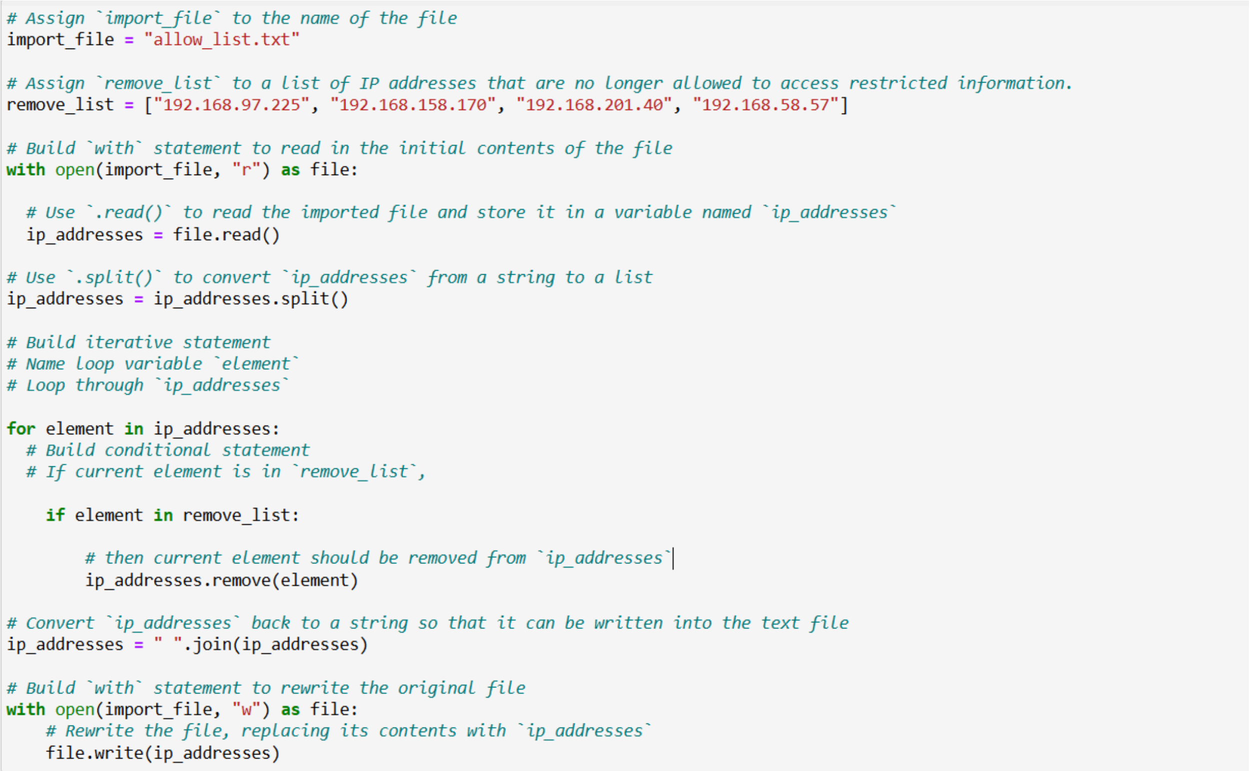
# Display `ip_addresses`

print(ip_addresses)
```

```
['ip_address', '192.168.25.60', '192.168.205.12', '192.168.6.9', '192.168.52.90', '192.168.90.124', '192.168.186.176', '192.16
8.133.188', '192.168.203.198', '192.168.218.219', '192.168.52.37', '192.168.156.224', '192.168.60.153', '192.168.69.116']
```

Update the file with the revised list of IP addresses

After removing restricted IPs, I converted the list back to a string using `.join()` and wrote the updated data to the file.



```python
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import_file = "allow_list.txt"

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remove_list = ["192.168.97.225", "192.168.158.170", "192.168.201.40", "192.168.58.57"]

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

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

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

for element in ip_addresses:
  # Build conditional statement
  # If current element is in `remove_list`,

    if element in remove_list:

        # then current element should be removed from `ip_addresses`
        ip_addresses.remove(element)

# Convert `ip_addresses` back to a string so that it can be written into the text file
ip_addresses = " ".join(ip_addresses)

# 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)
```

Summary

This Python script automates the process of managing an allow list for IP addresses. It reads a file containing allowed IPs, converts the contents into a list, loops through the remove list to remove unwanted IPs, and saves the updated allow list back into the file. This ensures only authorized users can access the system. The script is efficient, simple, and easy to update when needed.