Algorithm for file updates in Python

Project description

As part of your job as a security analyst, you're required to regularly update a file that identifies the employees who can access restricted content. Employees are restricted access based on their IP address. There is an allow list for IP addresses permitted to sign into the restricted subnetwork. There's also a remove list that identifies which employees you must remove from this allow list. Our task is to create an algorithm that uses Python code to check whether the allow list contains any IP addresses identified on the remove list.

Open the file that contains the allow list

```
# 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 so we can open the allow list

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

Read the file contents

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

import_file = "allow_list.txt"

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()

# 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

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

import_file = "allow_list.txt"

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

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.
168.90.124', '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

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

import_file = "allow_list.txt"

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

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

    ip_addresses = file.read()

ip_addresses = ip_addresses.split()

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

for element in remove_list:

  # Display `element` in every iteration

    print(element)
```

```
192.168.97.225
192.168.158.170
192.168.201.40
192.168.58.57
```

Remove IP addresses that are on the remove list

```
import_file = "allow_list.txt"

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

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

ip_addresses = ip_addresses.split()

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)

# 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.
168.133.188', '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

```
import_file = "allow_list.txt"

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

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

    ip_addresses = file.read()

ip_addresses = ip_addresses.split()

for element in remove_list:

    if element in 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 = "\n".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

The algorithm we created removes IP addresses identified in a remove_list variable from the "allow_list.txt" file of approved IP addresses. With this algorithm, we opened the file, converted it to a string to be read, and then converted this string to a list stored in the

variable ip_addresses. Then, we iterated through the IP addresses in remove_list and if the element was part of the ip_addresses list, we applied the
.remove() method to it to remove the element from ip_addresses. After this, we used the .join() method to convert the ip_addresses back into a string so that we could write over the contents of the "allow_list.txt" file with the revised list of IP addresses.