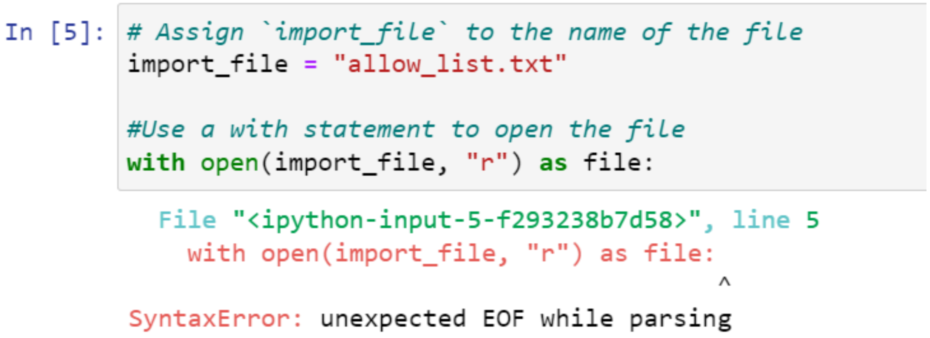
Algorithm for file updates in Python

Project description

The goal of this project is 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.

This project will revolve around creating an algorithm that uses Python code to check whether the allow list contains any IP addresses identified on the remove list. If such an IP address exists, it will be removed from the list.

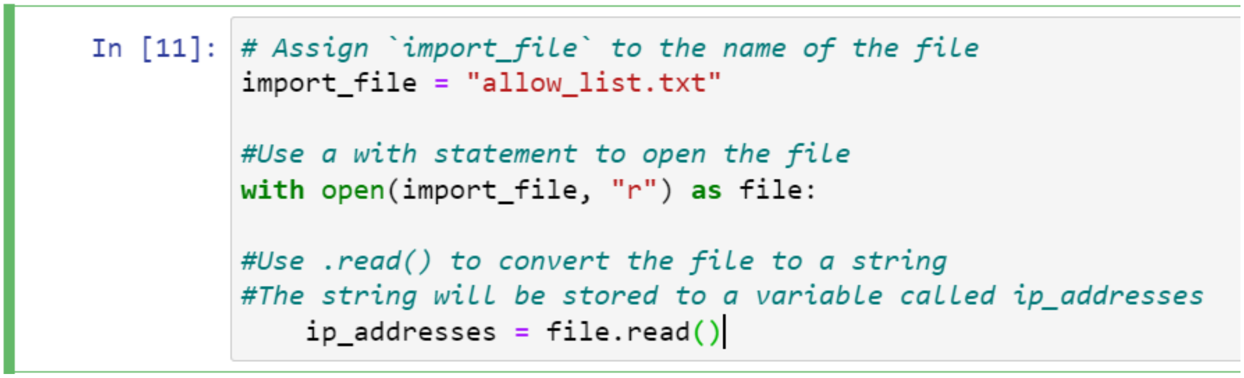
Open the file that contains the allow list



```
In [5]: # Assign `import_file` to the name of the file
        import_file = "allow_list.txt"

        #Use a with statement to open the file
        with open(import_file, "r") as file:

          File "<ipython-input-5-f293238b7d58>", line 5
            with open(import_file, "r") as file:
                                                ^
        SyntaxError: unexpected EOF while parsing
```

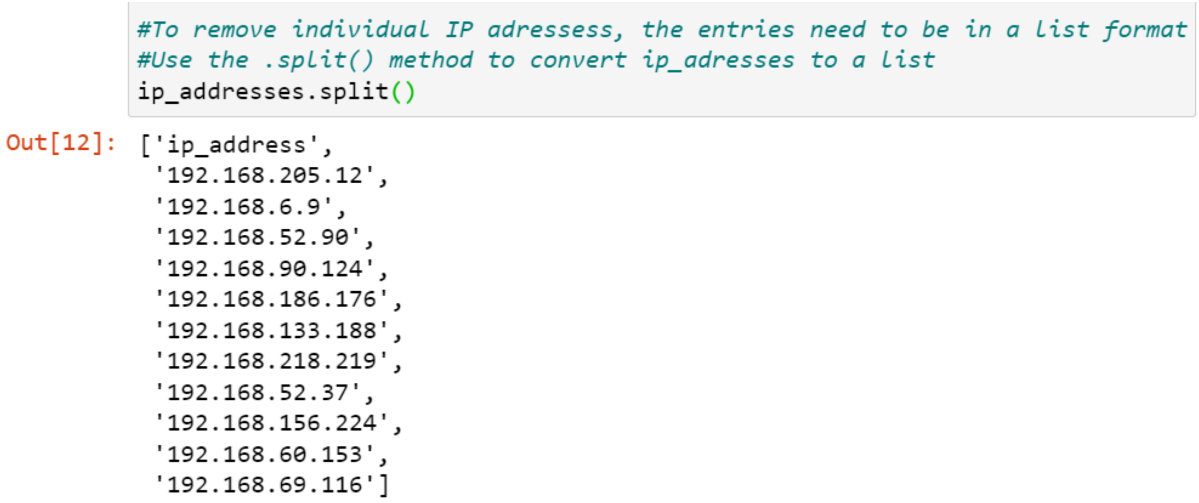
Running this code will produce an error because it will only contain the first line of the `with` statement; we will complete this `with` statement in the next section.

Read the file contents



```
In [11]: # Assign `import_file` to the name of the file
         import_file = "allow_list.txt"

         #Use a with statement to open the file
         with open(import_file, "r") as file:

         #Use .read() to convert the file to a string
         #The string will be stored to a variable called ip_addresses
             ip_addresses = file.read()
```

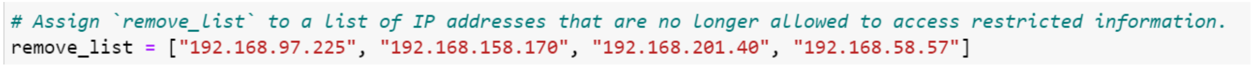
Convert the string into a list



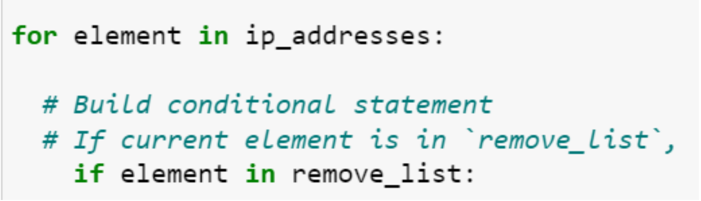
```
#To remove individual IP adressess, the entries need to be in a list format
#Use the .split() method to convert ip_adresses to a list
ip_addresses.split()
```

```
Out[12]: ['ip_address',
          '192.168.205.12',
          '192.168.6.9',
          '192.168.52.90',
          '192.168.90.124',
          '192.168.186.176',
          '192.168.133.188',
          '192.168.218.219',
          '192.168.52.37',
          '192.168.156.224',
          '192.168.60.153',
          '192.168.69.116']
```

Iterate through the remove list

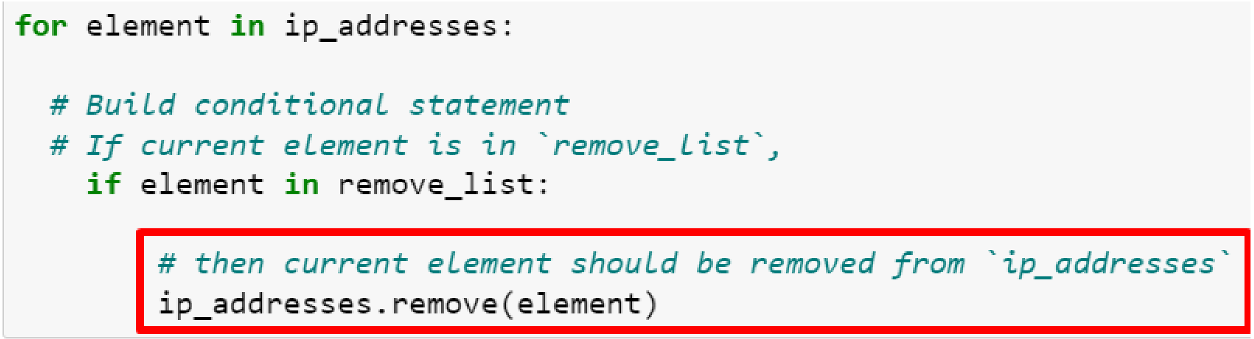


```
# Assign `remove_list` to a list of IP addresses that are no longer allowed to access restricted information.
remove_list = ["192.168.97.225", "192.168.158.170", "192.168.201.40", "192.168.58.57"]
```



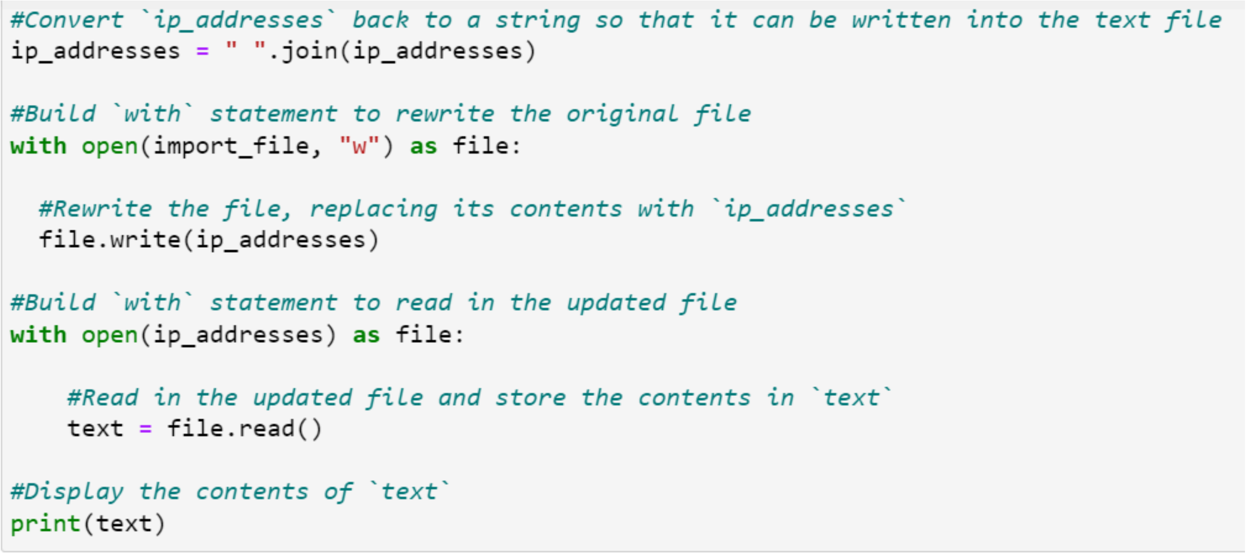
```
for element in ip_addresses:

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

Remove IP addresses that are on the remove list



```
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)
```

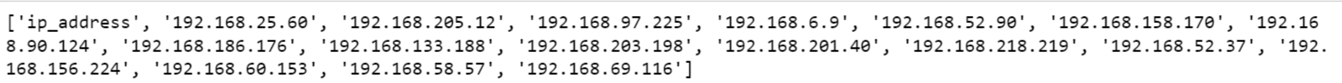
Update the file with the revised list of IP addresses



```
#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)

#Build `with` statement to read in the updated file
with open(ip_addresses) as file:

    #Read in the updated file and store the contents in `text`
    text = file.read()

#Display the contents of `text`
print(text)
```

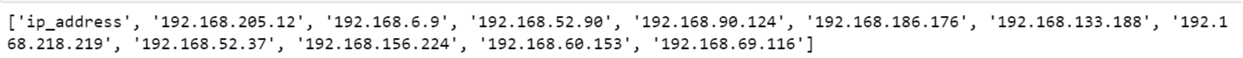
Summary

Original allow_list.txt



```
['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']
```

Updated allow_list.txt



```
['ip_address', '192.168.205.12', '192.168.6.9', '192.168.52.90', '192.168.90.124', '192.168.186.176', '192.168.133.188', '192.1
68.218.219', '192.168.52.37', '192.168.156.224', '192.168.60.153', '192.168.69.116']
```

We created an algorithm that parses the file allow_list.txt and removes the IP addresses listed in the remove list. After the IP addresses are removed, we update the file with the revised list. This is but one example of how we can use Python to automate cybersecurity tasks.