



**RAMNIRANJAN JHUNJHUNWALA COLLEGE
GHATKOPAR (W), MUMBAI - 400 086**

**DEPARTMENT OF
INFORMATION TECHNOLOGY**

2021 - 2022

M.Sc. (I.T.) Part II (Sem - 3)

Subject: Computer Hacking Forensic Investigation

**Name: Sneha Ramchandra Pawar.
Roll No.: 18**



Hindi Vidya Prachar Samiti's

**RAMNIRANJAN
JHUNJHUNWALA COLLEGE
(AUTONOMOUS)**



Opposite Ghatkopar Railway Station, Ghatkopar West, Mumbai-400086

CERTIFICATE

This is to certify that **Miss. Sneha Ramchandra Pawar** with Roll No. **18** has successfully completed the necessary course of experiments in the subject of **Computer Hacking Forensic Investigation** during the academic year **2021 – 2022** complying with the requirements of **RAMNIRANJAN JHUNJHUNWALA COLLEGE OF ARTS, SCIENCE AND COMMERCE**, for the course of **M.Sc. (IT) Part II Semester – III.**

Internal Examiner

External Examiner

Head Of Department

College Seal

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Practical No. 01

Aim: File System Analysis using Autopsy.

What is Autopsy?

Autopsy is a digital forensics platform and graphical interface to The Sleuth Kit and other digital forensics tools. It is used by law enforcement, military, and corporate examiners to investigate what happened on a computer. You can even use it to recover photos from your camera's memory card.

Easy to Use

Autopsy was designed to be intuitive out of the box. Installation is easy and wizards guide you through every step. All results are found in a single tree. See the intuitive page for more details.

Extensible

Autopsy was designed to be an end-to-end platform with modules that come with it out of the box and others that are available from third-parties. Some of the modules provide:

- Timeline Analysis - Advanced graphical event viewing interface (video tutorial included).
- Hash Filtering - Flag known bad files and ignore known good.
- Keyword Search - Indexed keyword search to find files that mention relevant terms.
- Web Artifacts - Extract history, bookmarks, and cookies from Firefox, Chrome, and IE.
- Data Carving - Recover deleted files from unallocated space using PhotoRec
- Multimedia - Extract EXIF from pictures and watch videos.
- Indicators of Compromise - Scan a computer using STIX.

See the Features page for more details. Developers should refer to the module development page for details on building modules.

Fast

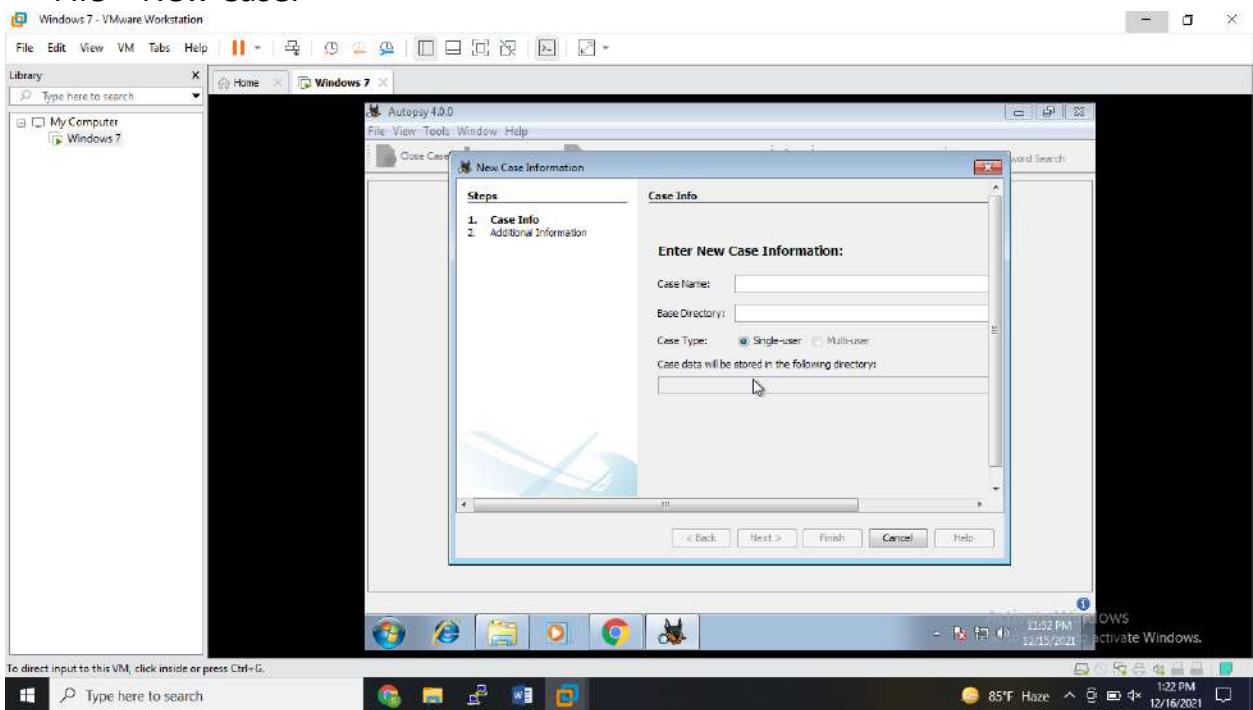
Everyone wants results yesterday. Autopsy runs background tasks in parallel using multiple cores and provides results to you as soon as they are found. It may take hours to fully search the drive, but you will know in minutes if your keywords were found in the user's home folder. See the fast results page for more details.

Cost Effective

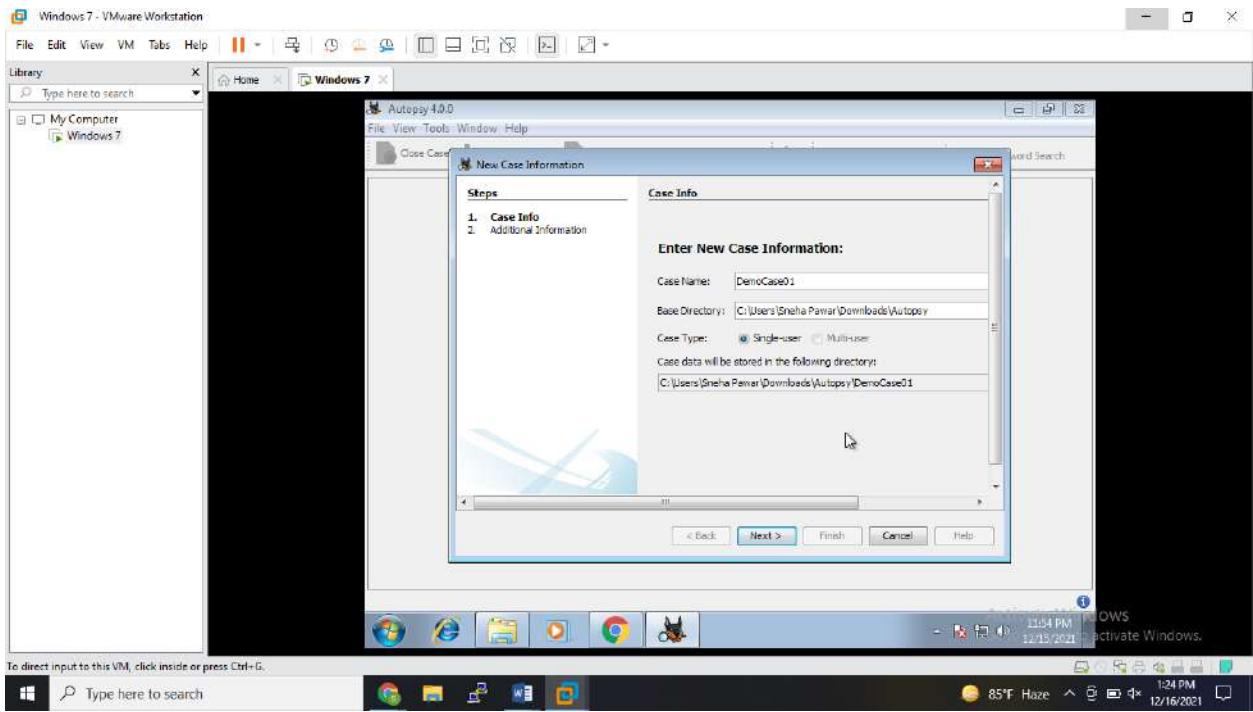
Autopsy is free. As budgets are decreasing, cost effective digital forensics solutions are essential. Autopsy offers the same core features as other digital forensics tools and offers other essential features, such as web artifact analysis and registry analysis, that other commercial tools do not provide.

Steps:

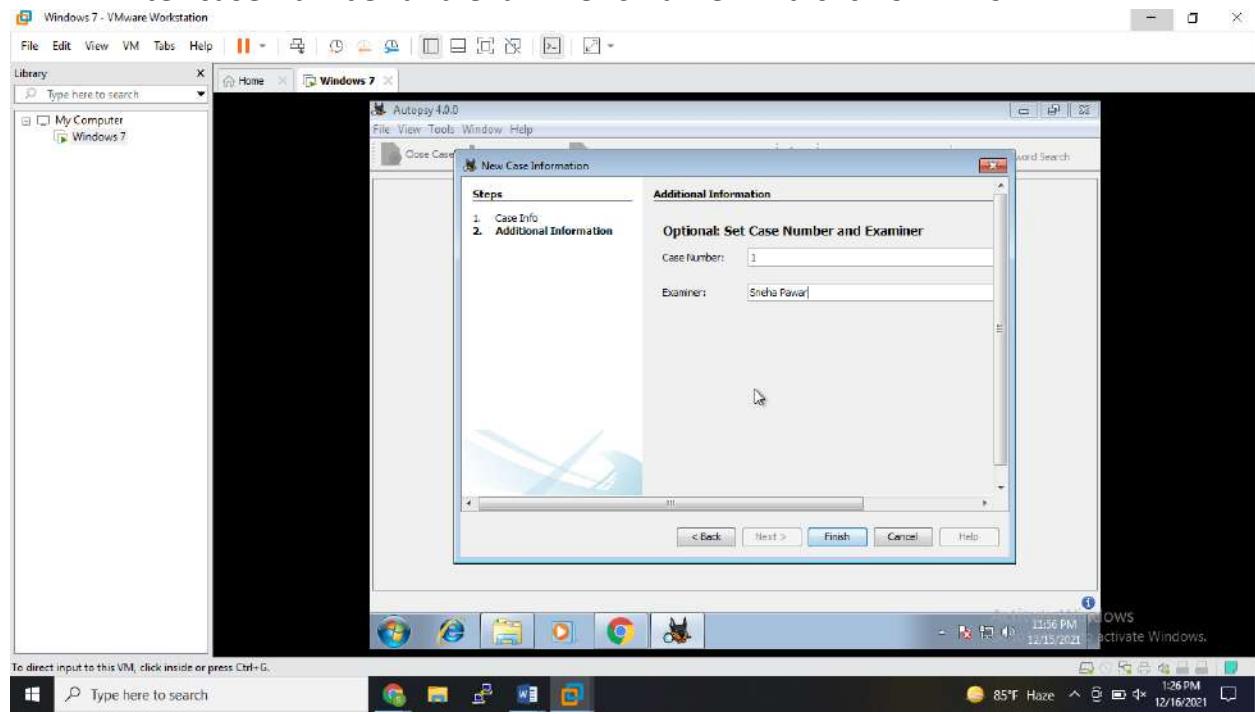
Install the Autopsy Tool. Start Autopsy Tool. Click on Create new case Or File – New Case.



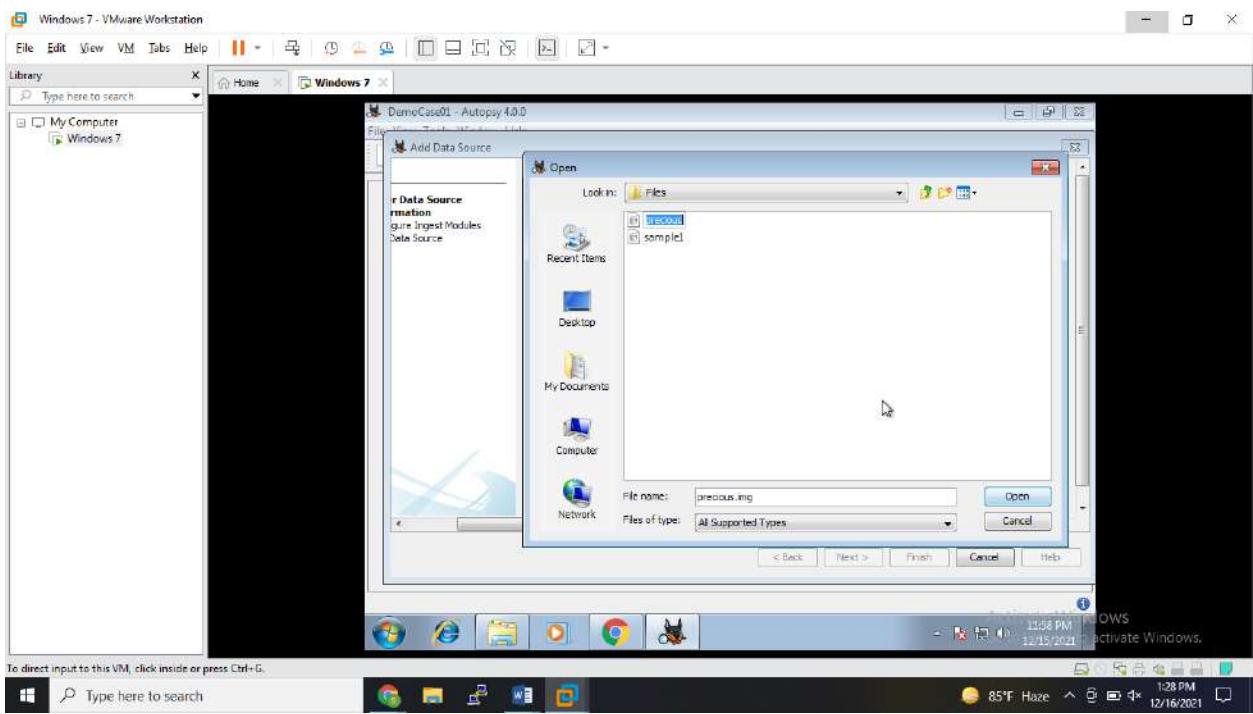
Enter case name and provide Base Directory for case. And keep rest as default and click Next.



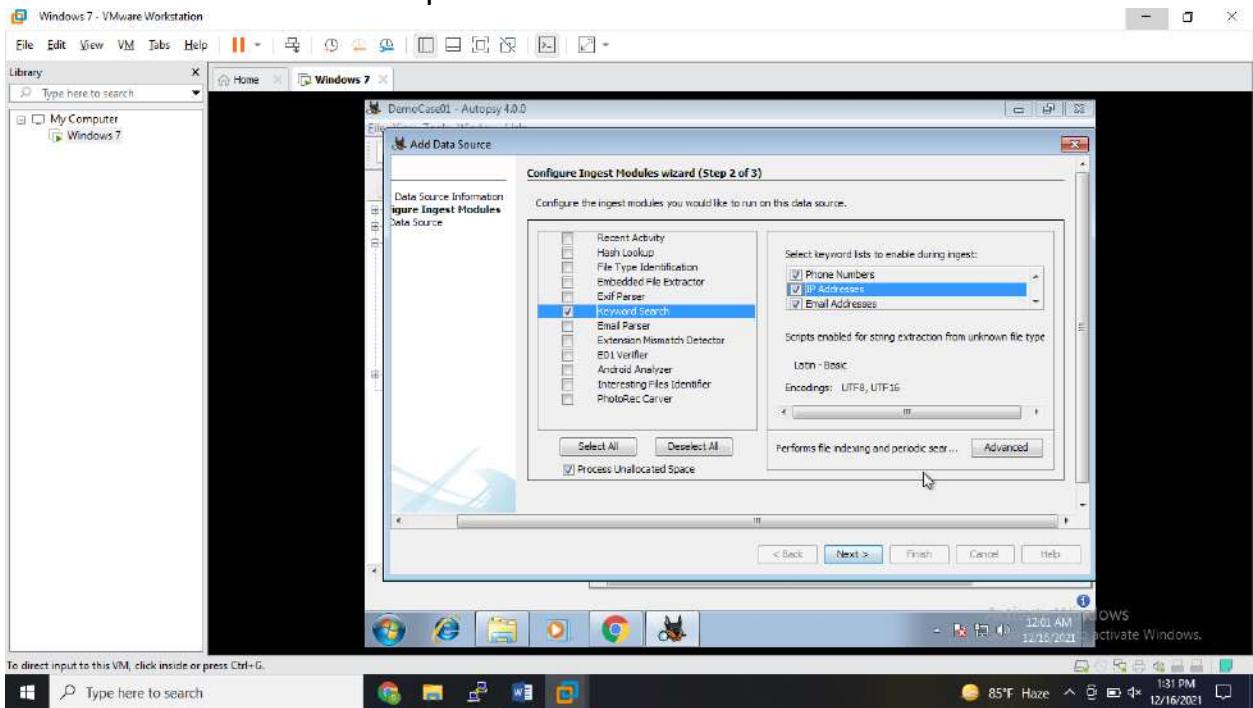
Enter case number and examiner's name. And click on Finish.



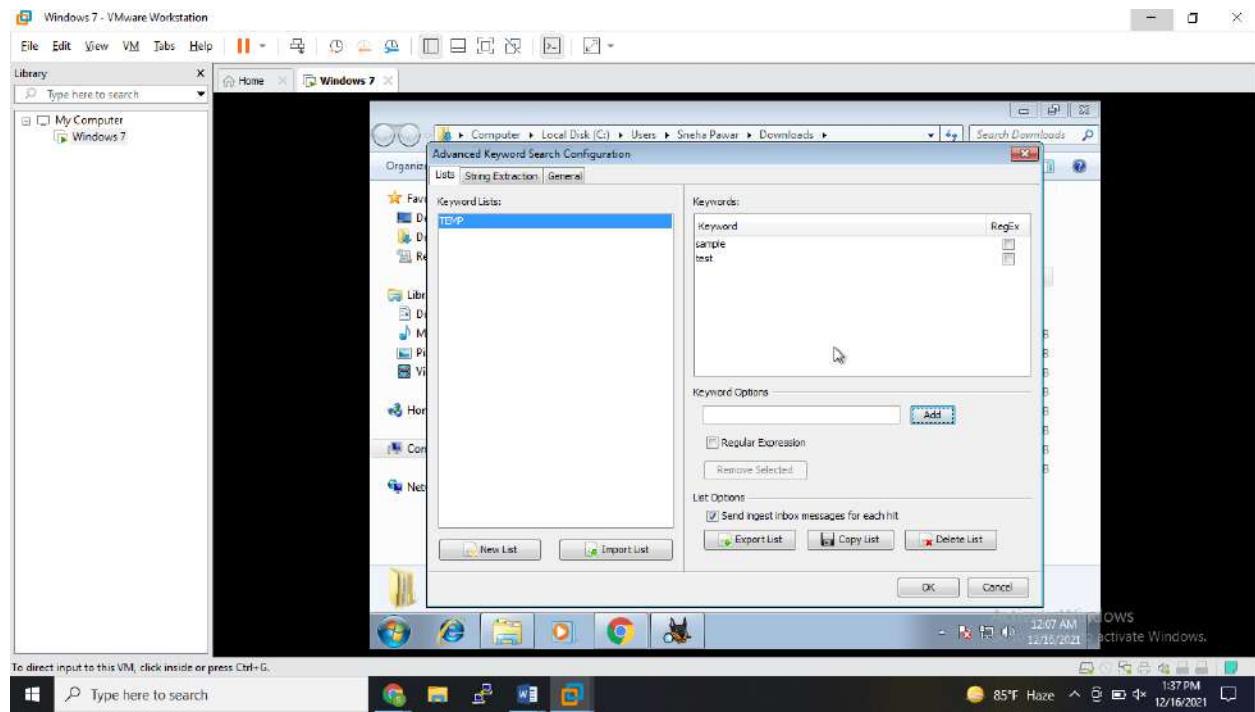
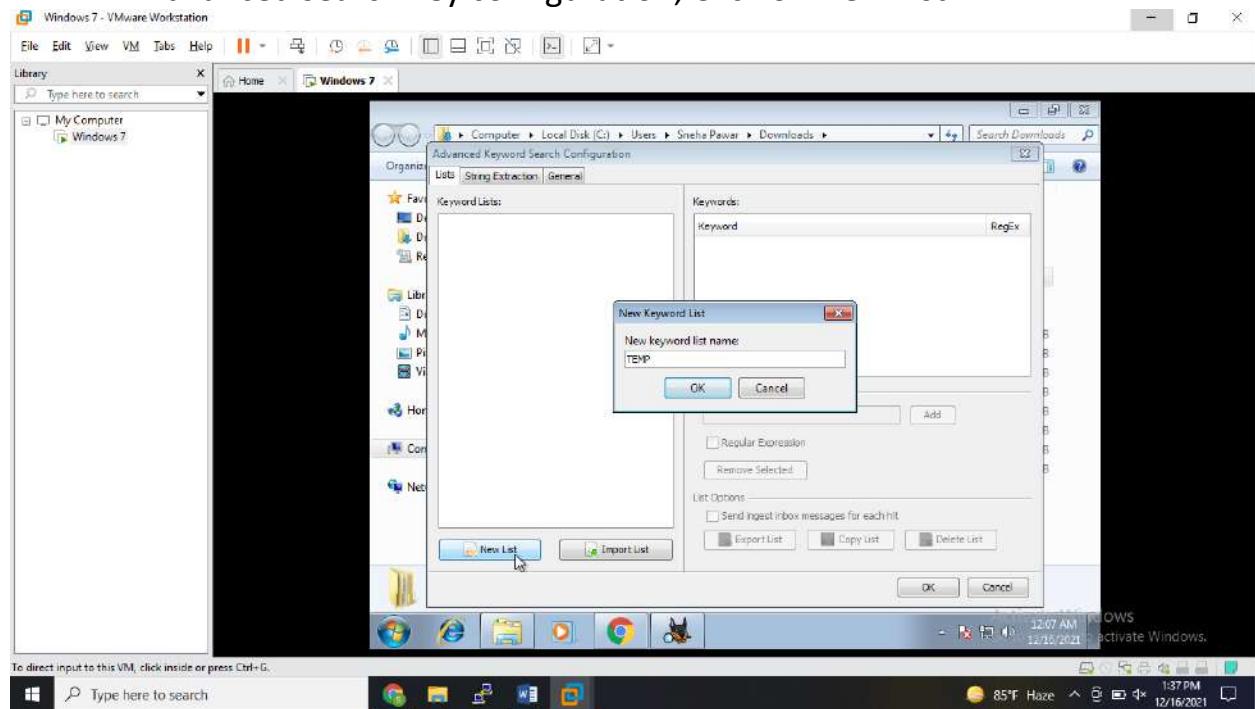
After Clicking The Finish Button In The Above Window,
A New Window Will Open For Retrieving The Datasource, Select Disk Image
or VM File
Then Browse The .img File Present In The Directory Click Next.



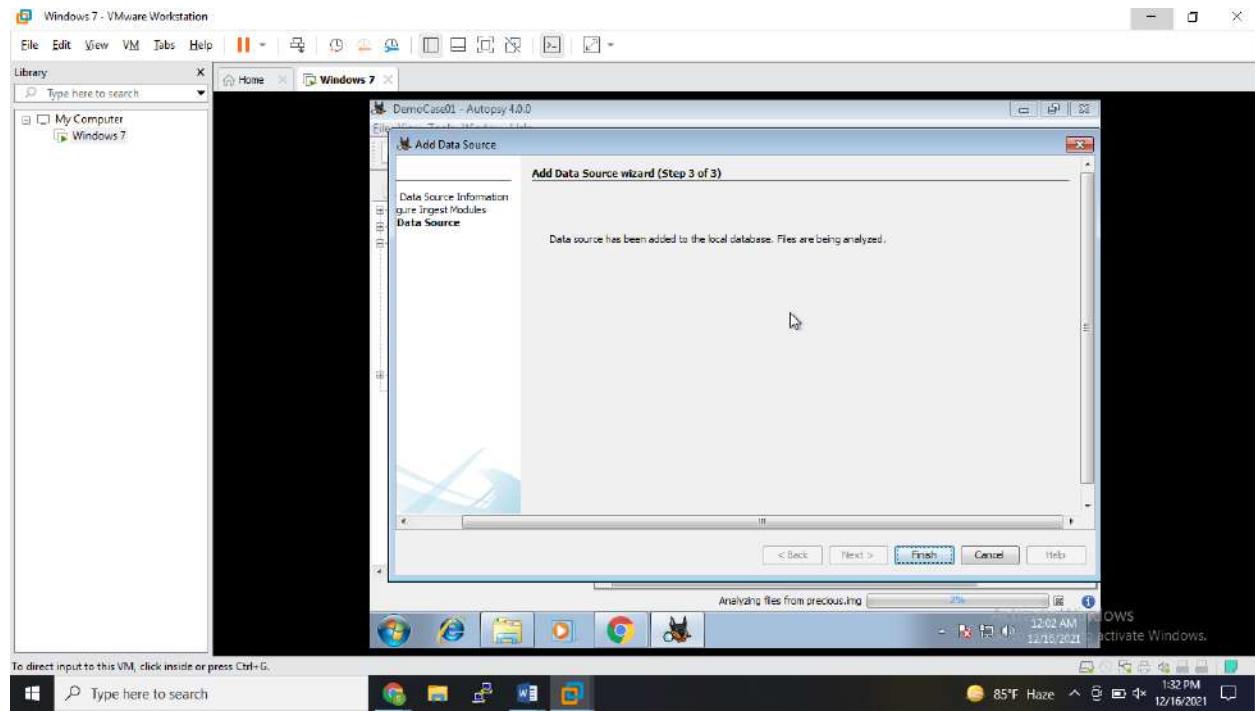
The Next Step Provides A Ingest Wizard Panel Which Aims At Increasing The Search Capability. Click Deselect all And select Keyword Search only Proceed To The Next Step.



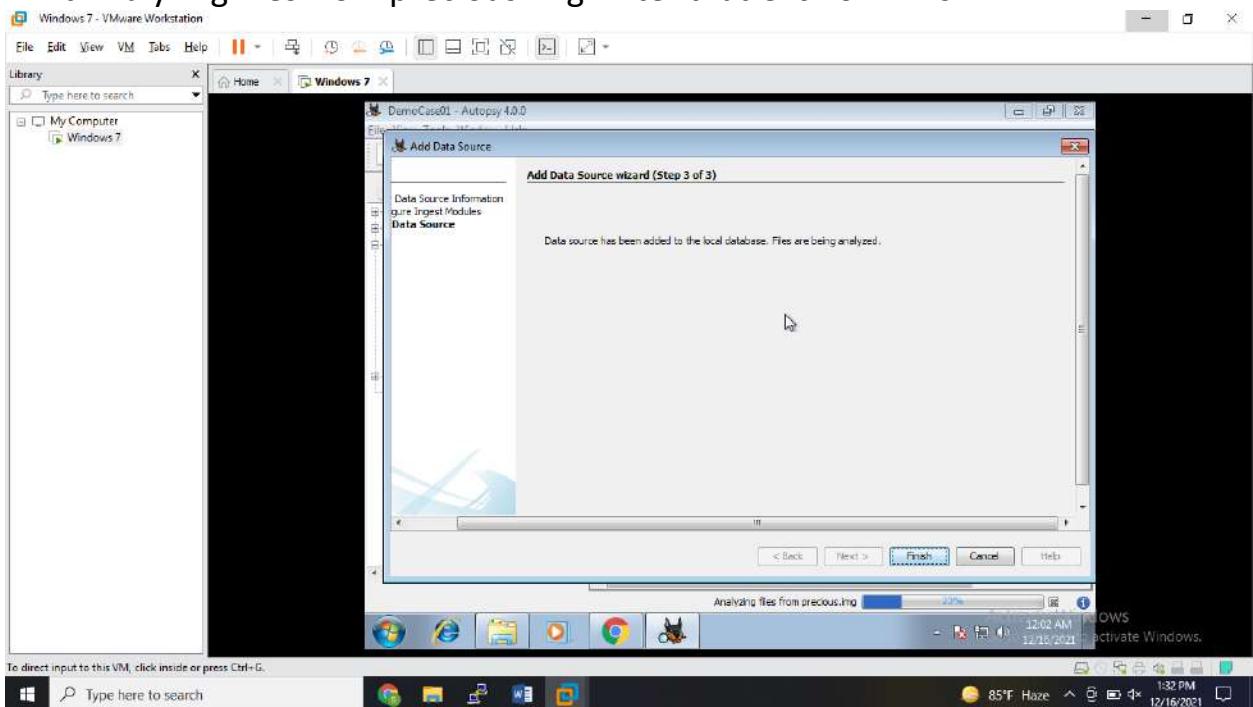
In Advanced search key configuration, Click on New List.



In the Resulting Window, You'll Be Notified That The Files Are Being Analysed.
Proceed to Finish.

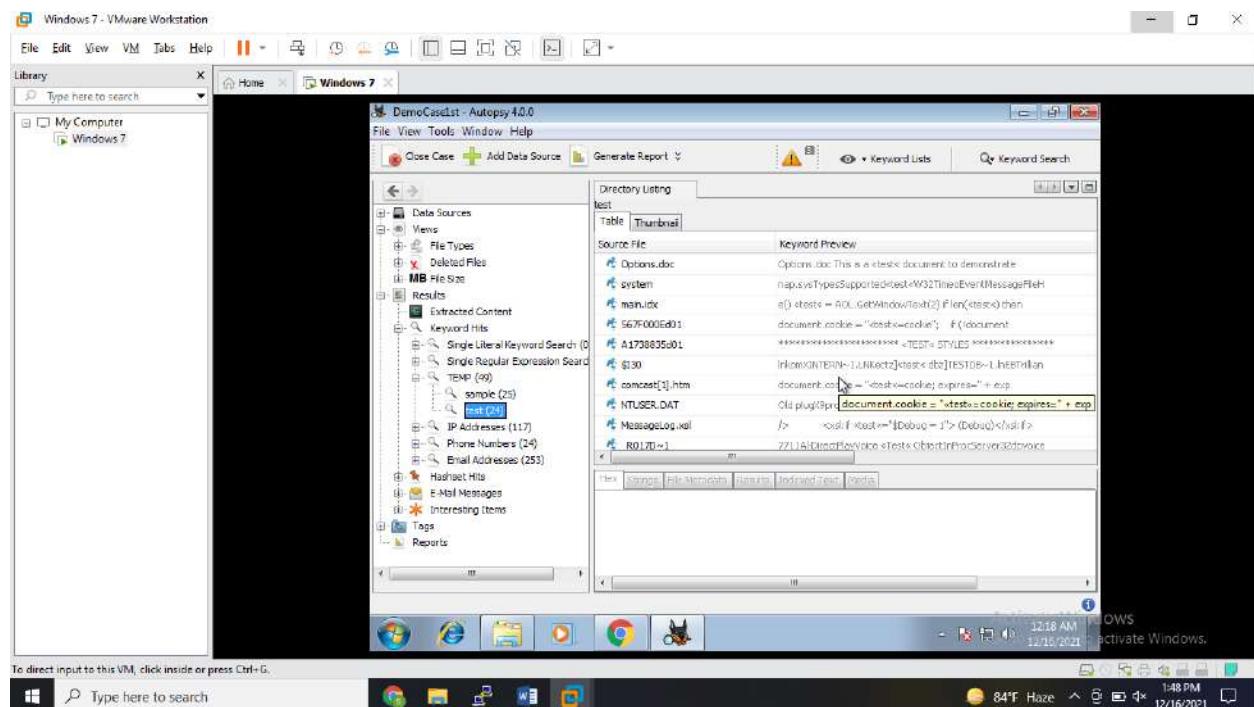
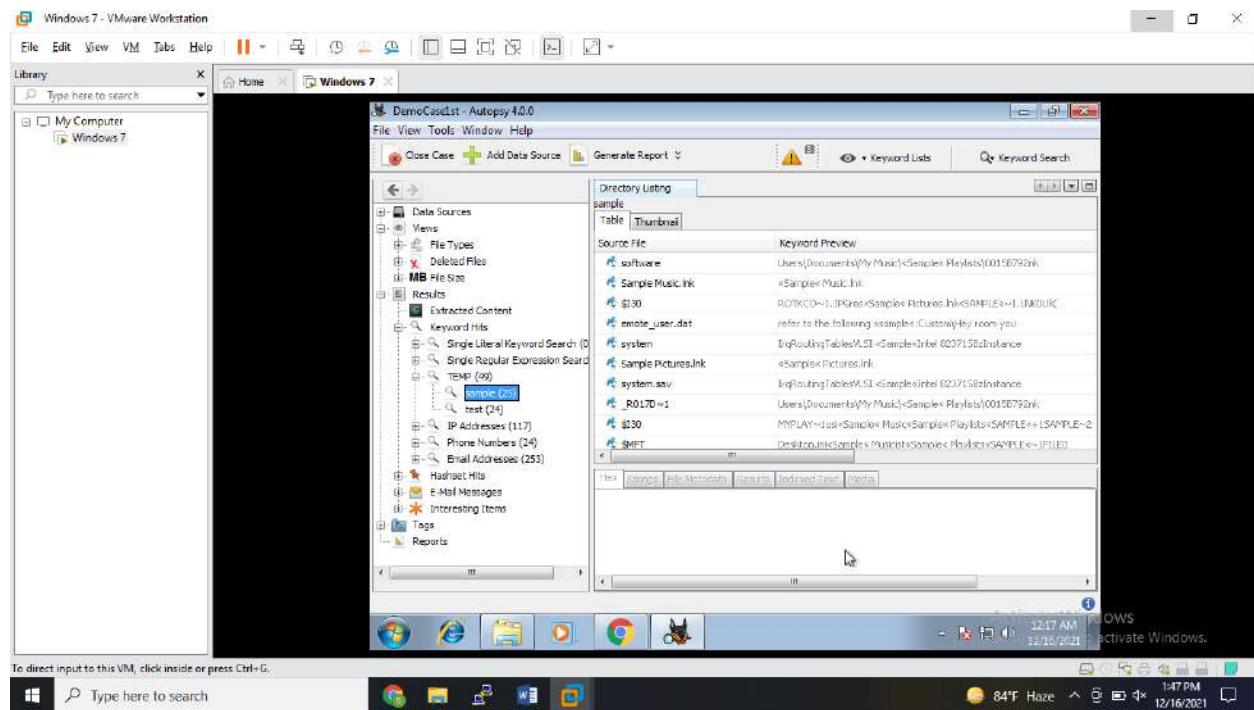


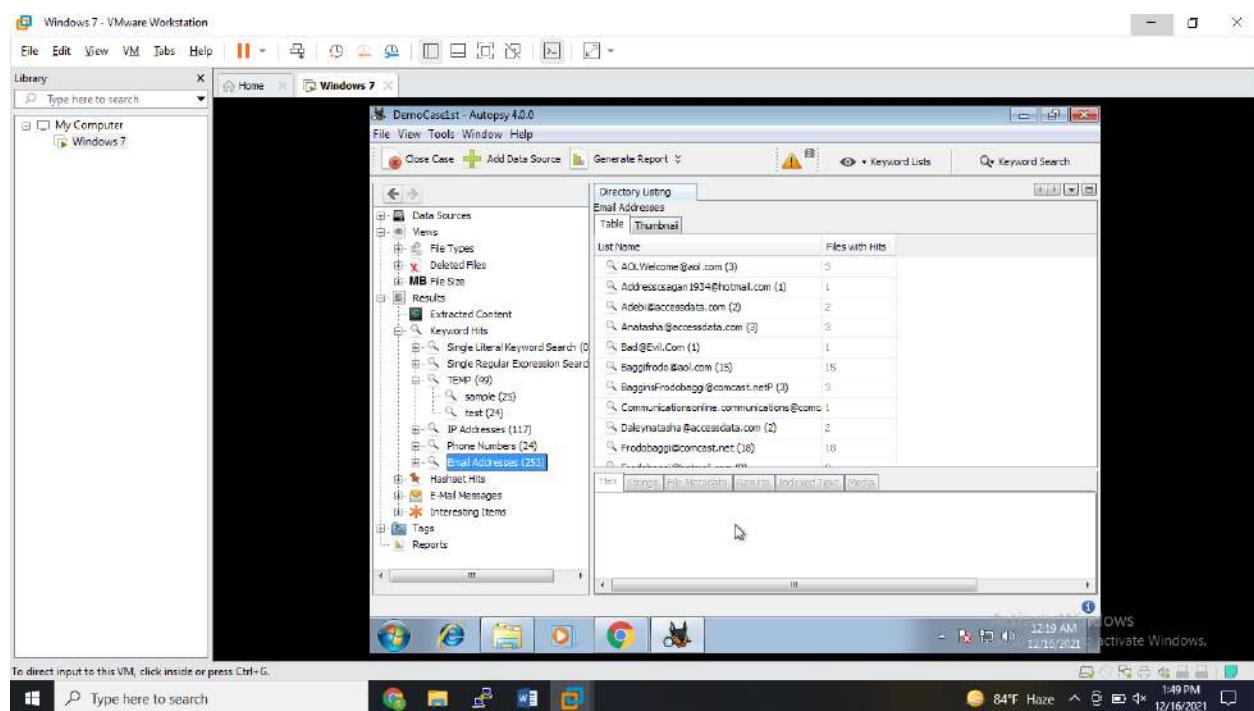
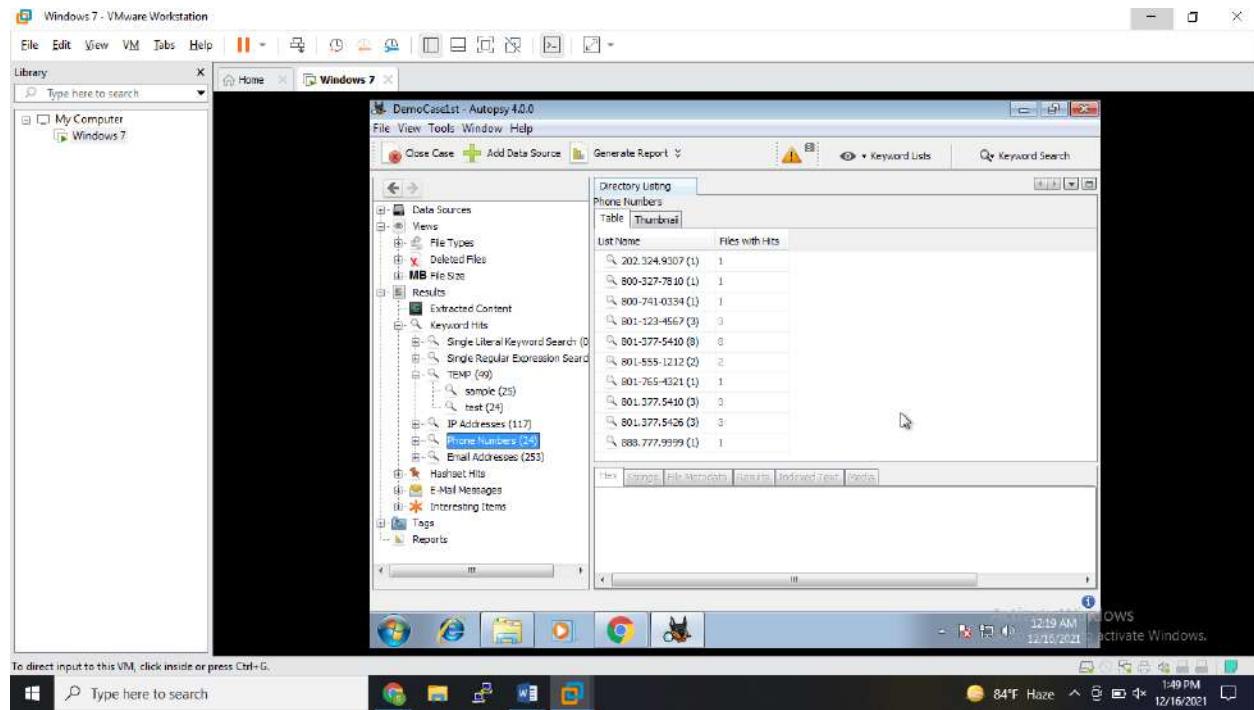
It Analyzing files from precious.img. After that Click on Finish.

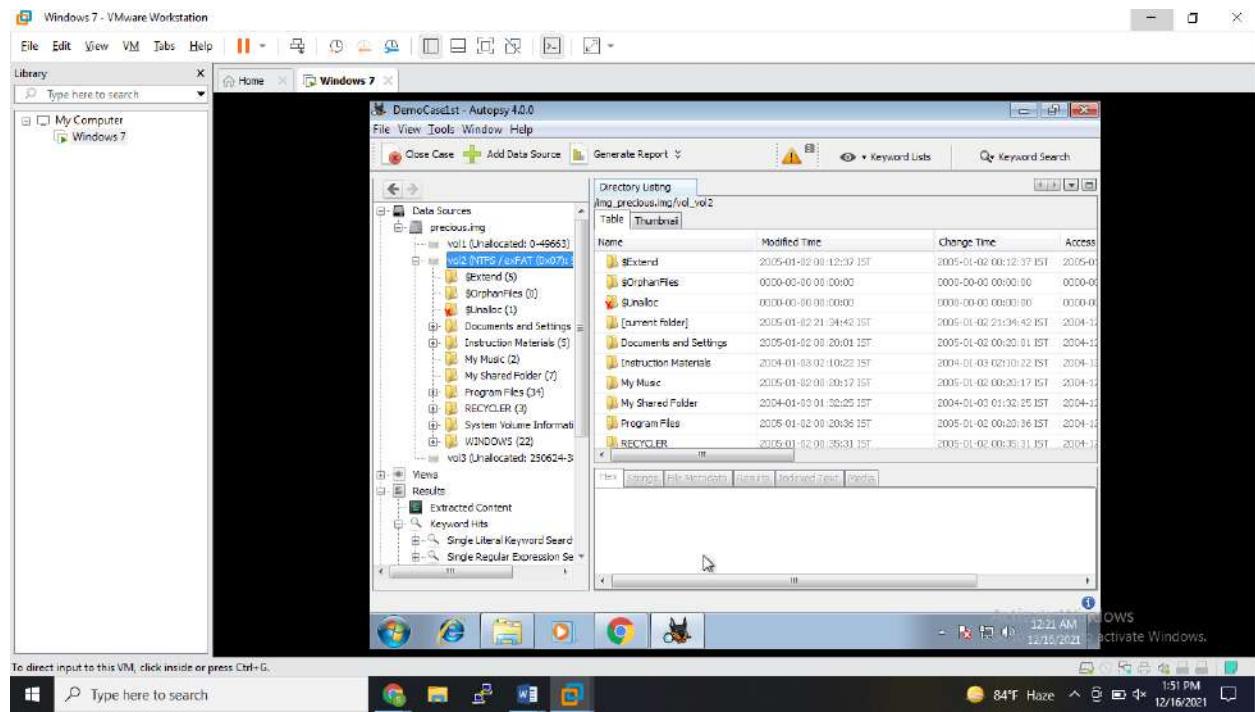
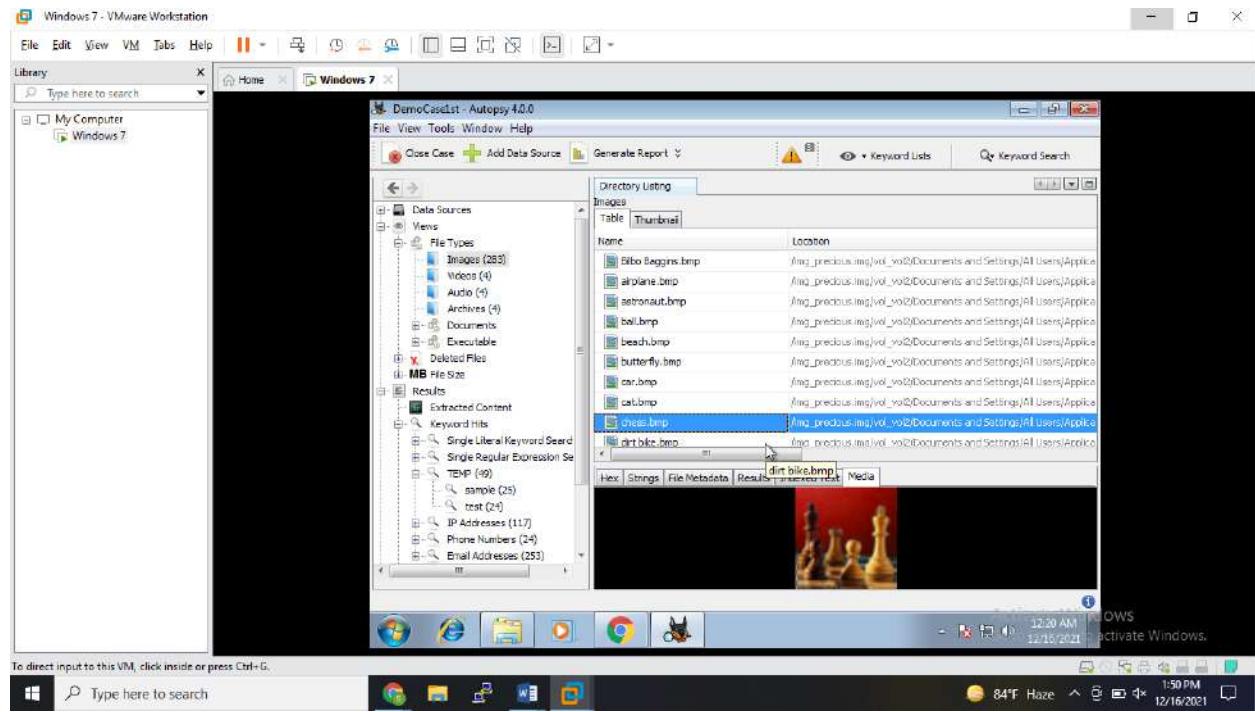


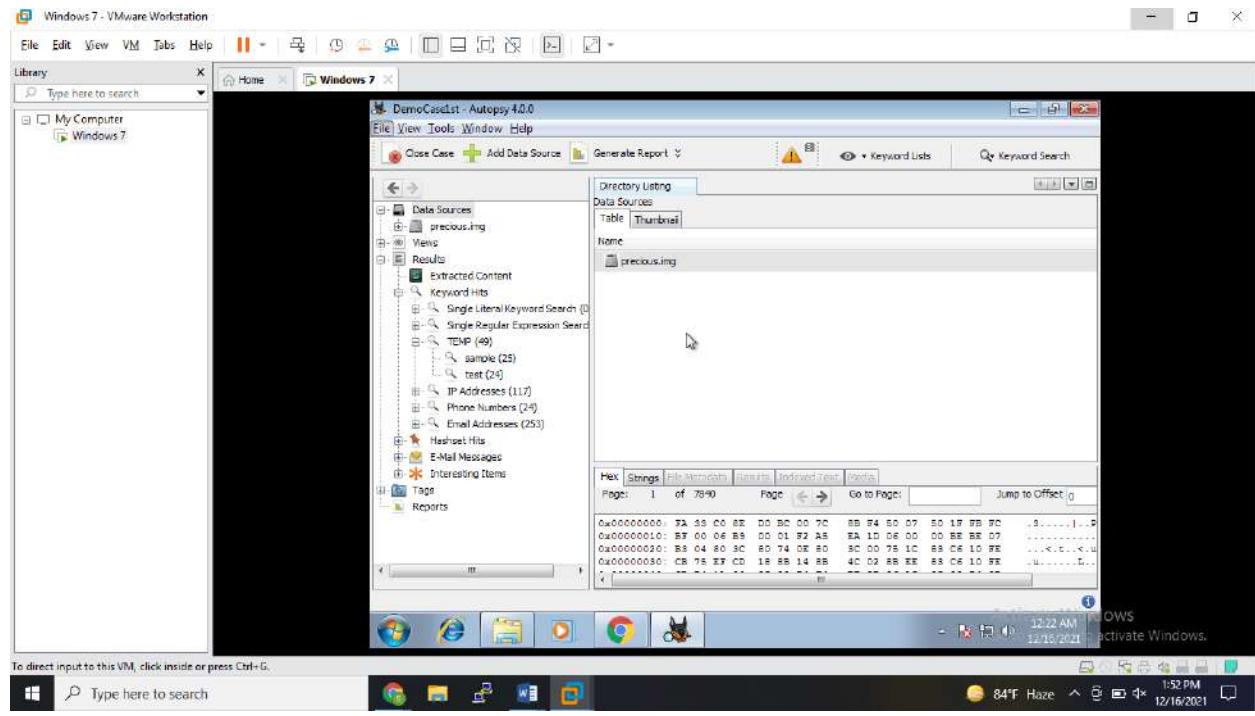
After The Image Is Indexed The Tree Will Be Populated By The File System, Extracted Content, Keyword Searches, And The Hash List (If Any Were

Used). This Tree Can Be To Retrieve The Information About The Image File Under Observation

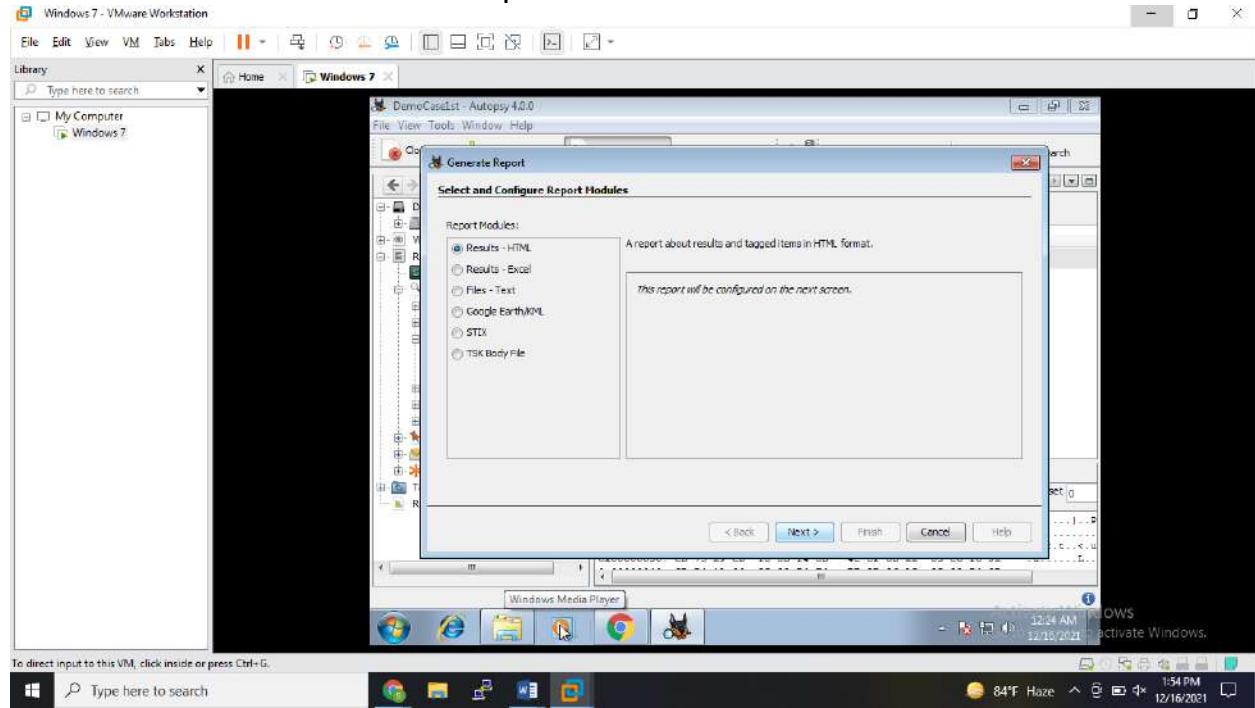


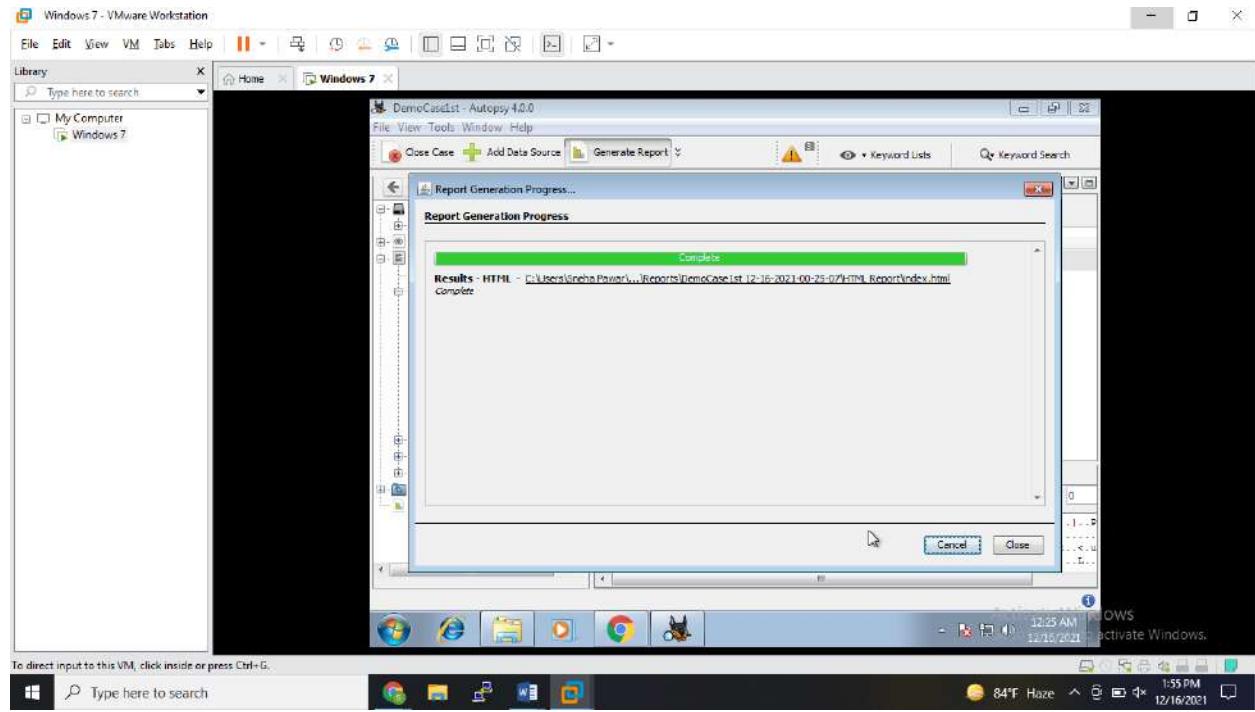
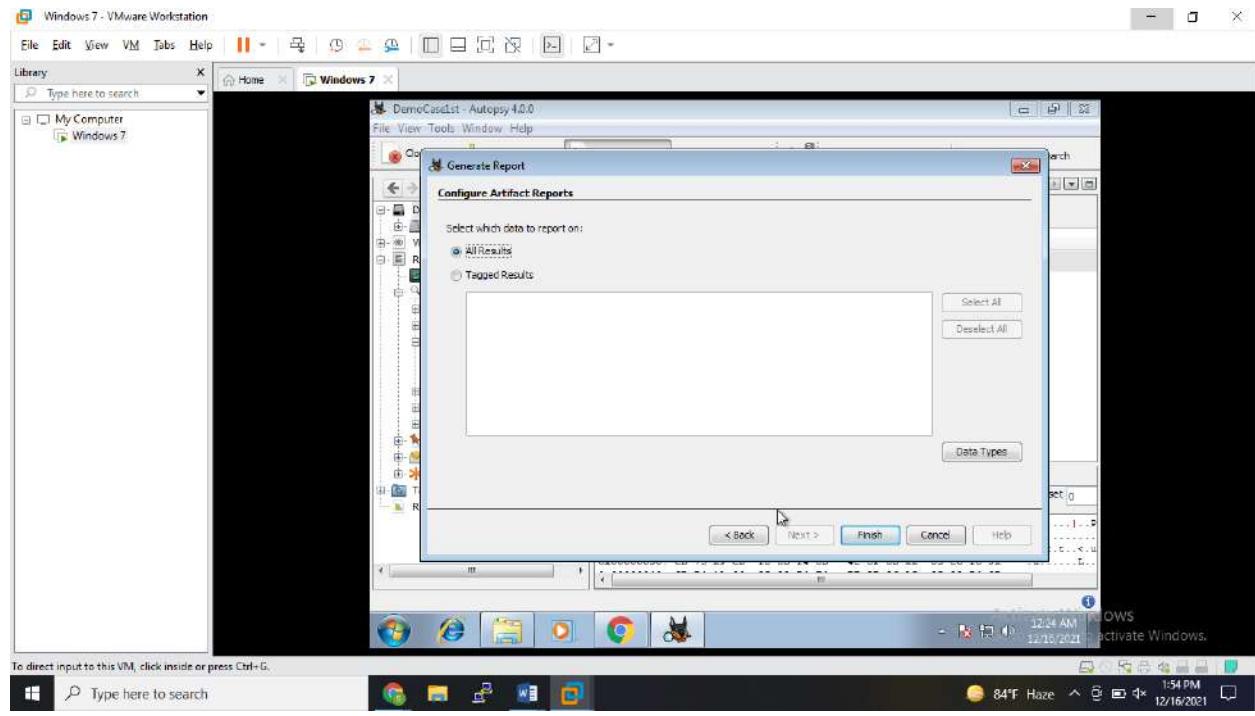






Then click on Generate Report.





Double click on the link.

To direct input to this virtual machine, press Ctrl+G.

Report Navigation

- Case Summary
- Keyword Hits (443)
- Tagged Files (0)
- Tagged Results (0)
- Thumbnails (0)

Autopsy Forensic Report

HTML Report Generated on 2021/12/16 00:25:07

Case: DemoCase1st
Case Number: 1
Examiner: Sneha Pawar
Number of Images: 1

Image Information:

precious.img

Activate Windows Show all

autopsy-4.0.0-32bit.msi

Windows 7

12:26 AM 12/16/2021

To direct input to this virtual machine, press Ctrl+G.

Report Navigation

- Case Summary
- Keyword Hits (443)
- Tagged Files (0)
- Tagged Results (0)
- Thumbnails (0)

Image Information:

precious.img

Timezone: Asia/Calcutta
Path: C:\Users\Sneha Pawar\Downloads\Files\Files\precious.img

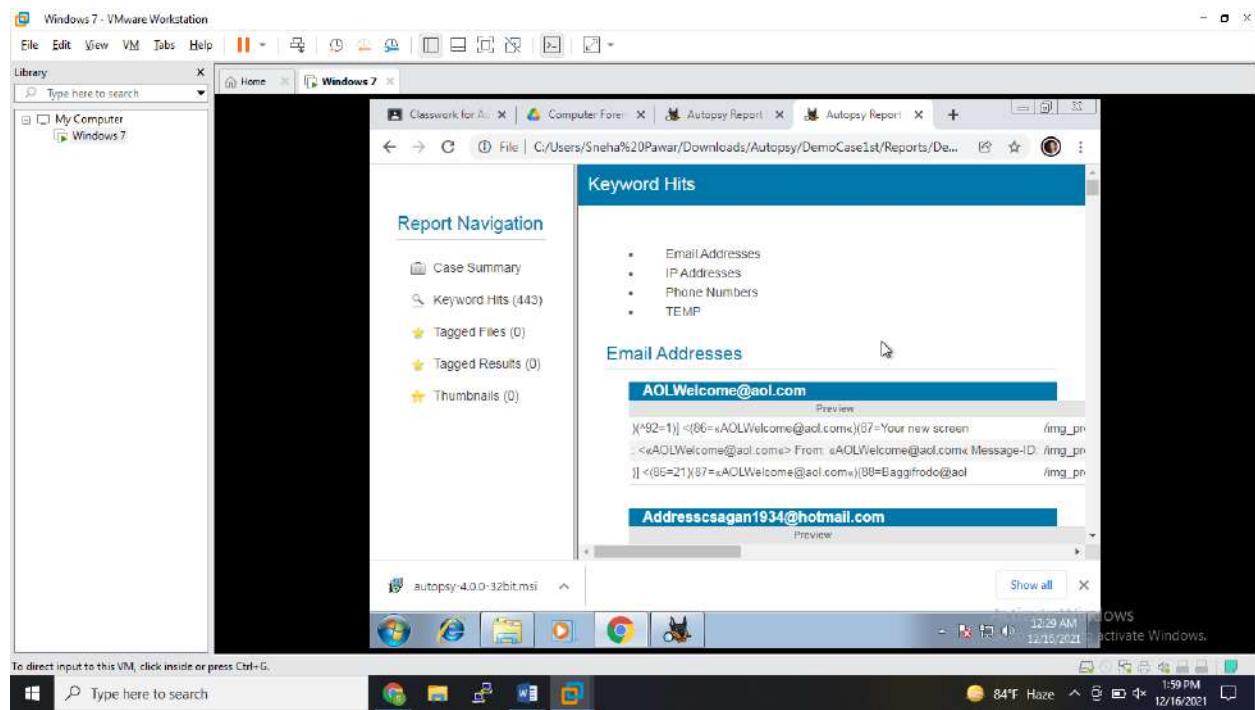


Activate Windows Show all

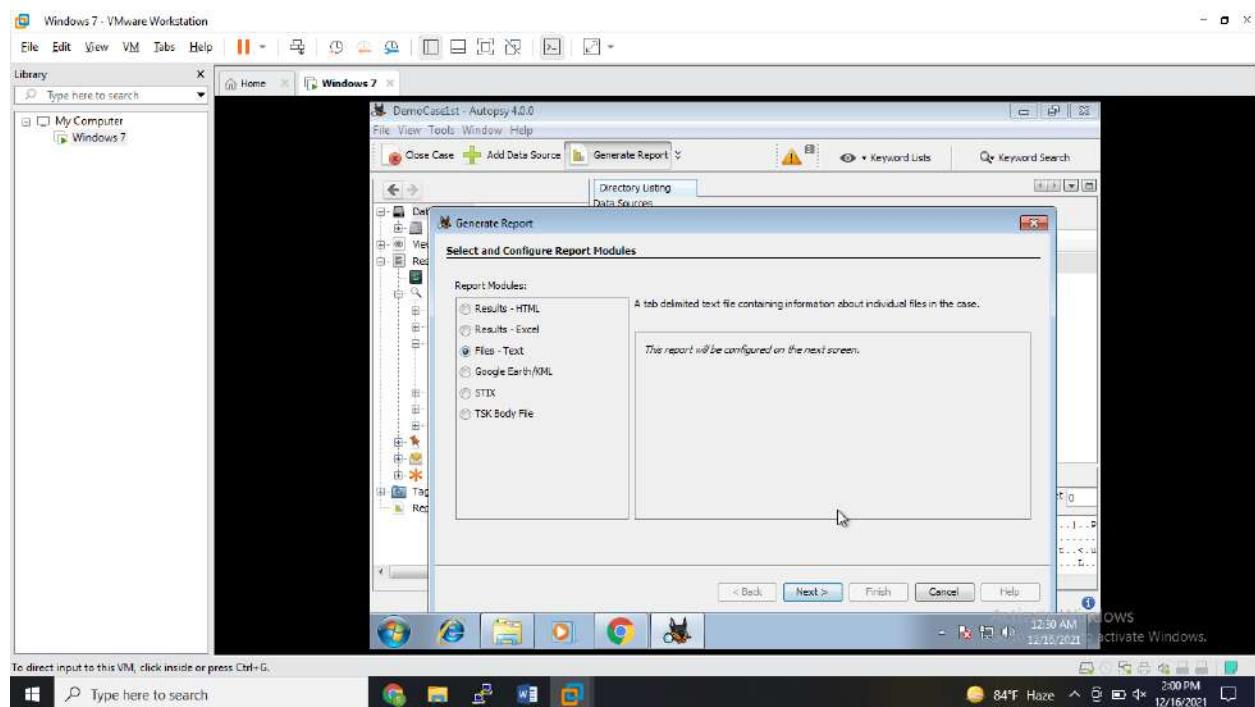
autopsy-4.0.0-32bit.msi

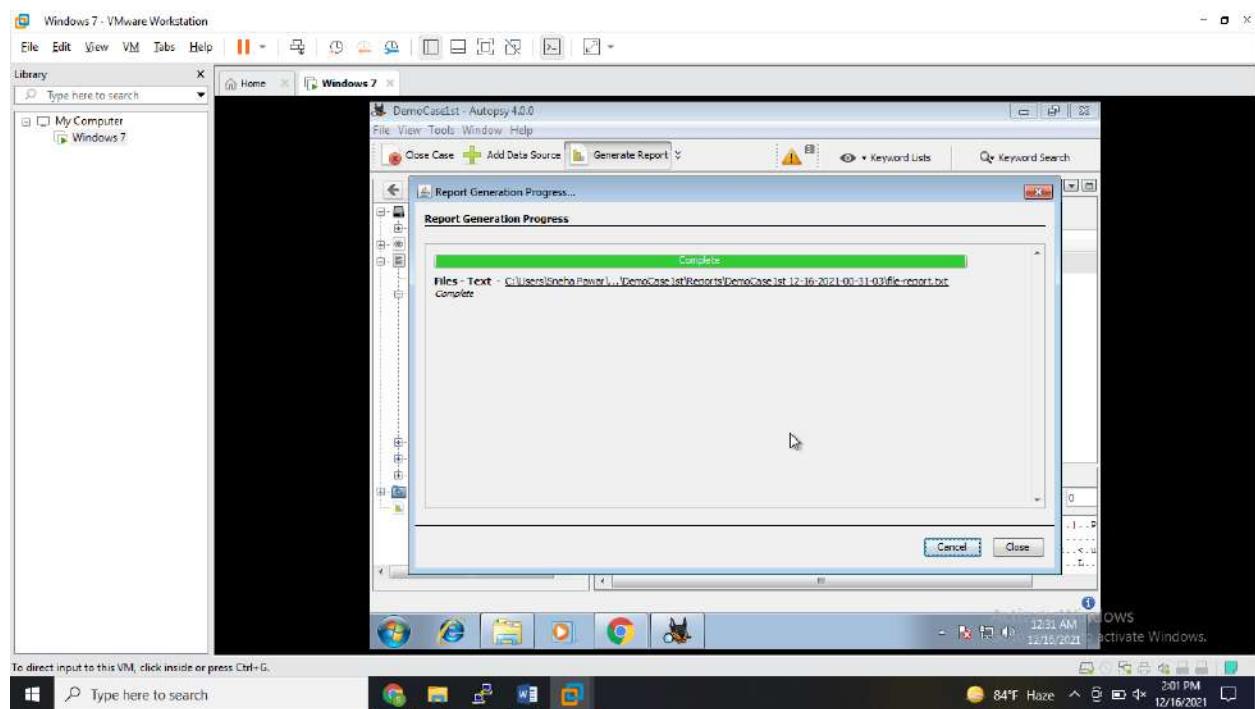
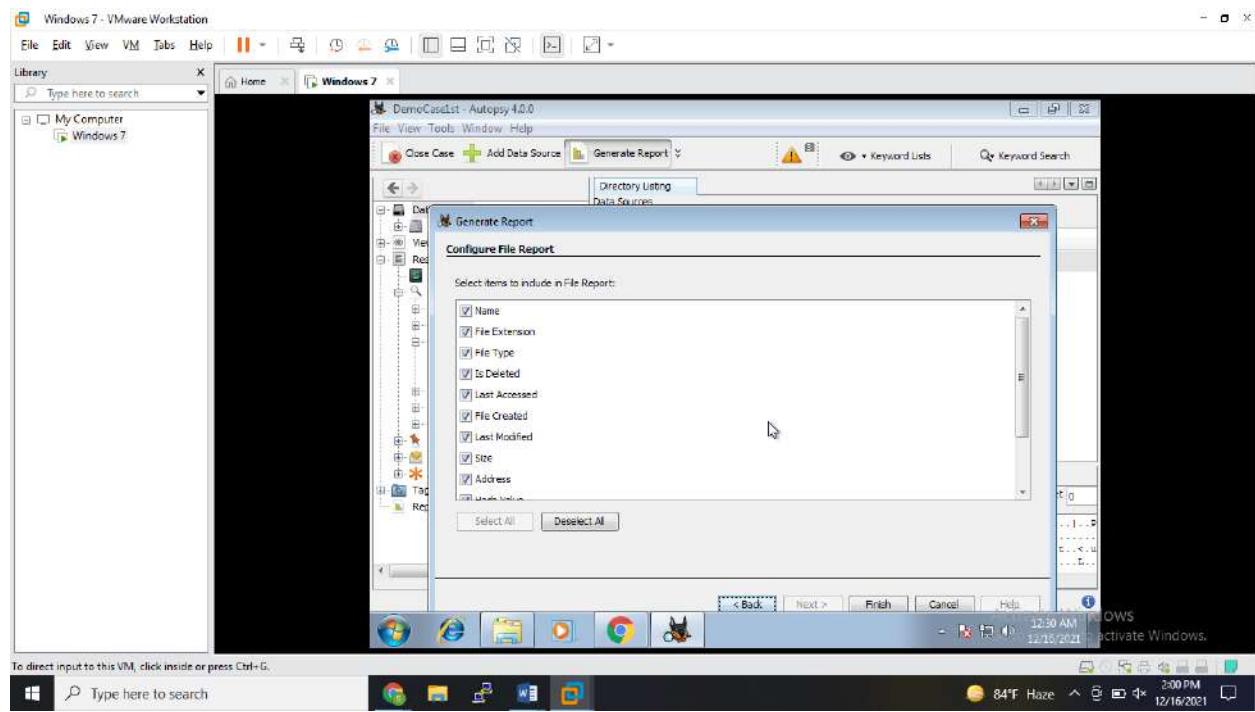
Windows 7

12:28 AM 12/16/2021

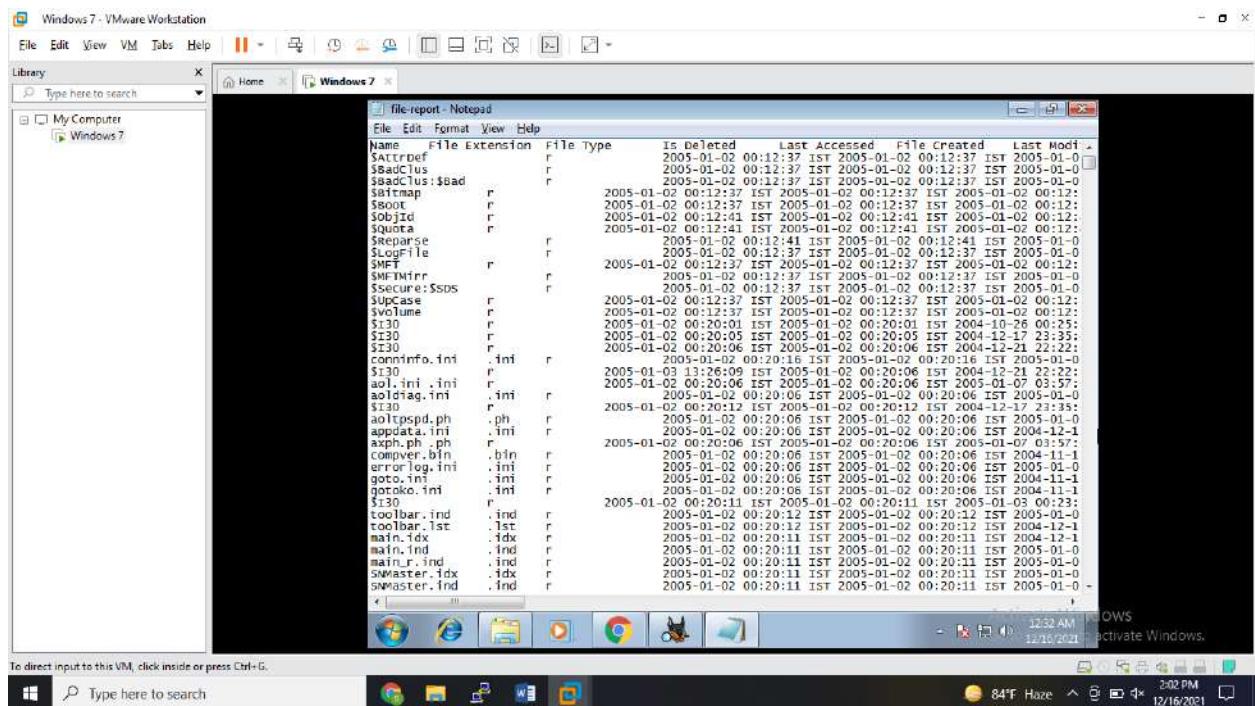


You can also generate report in text file.





Double click on link. Report in Text file will be generated.



Practical No. 02

Aim: Using Windows Forensics Toolkit [AccessData FTK].

What is AccessData FTK Tool?

Forensic Toolkit, or FTK, is a computer forensics software made by AccessData. It **scans a hard drive looking for various information**. It can, for example, potentially locate deleted emails and scan a disk for text strings to use them as a password dictionary to crack encryption.

FTK provides an **intuitive interface for email analysis** for forensic professionals. This includes having the ability to parse emails for certain words, header analysis for source IP address, etc. A central feature of FTK, file decryption is arguably the most common use of the software.

Steps:

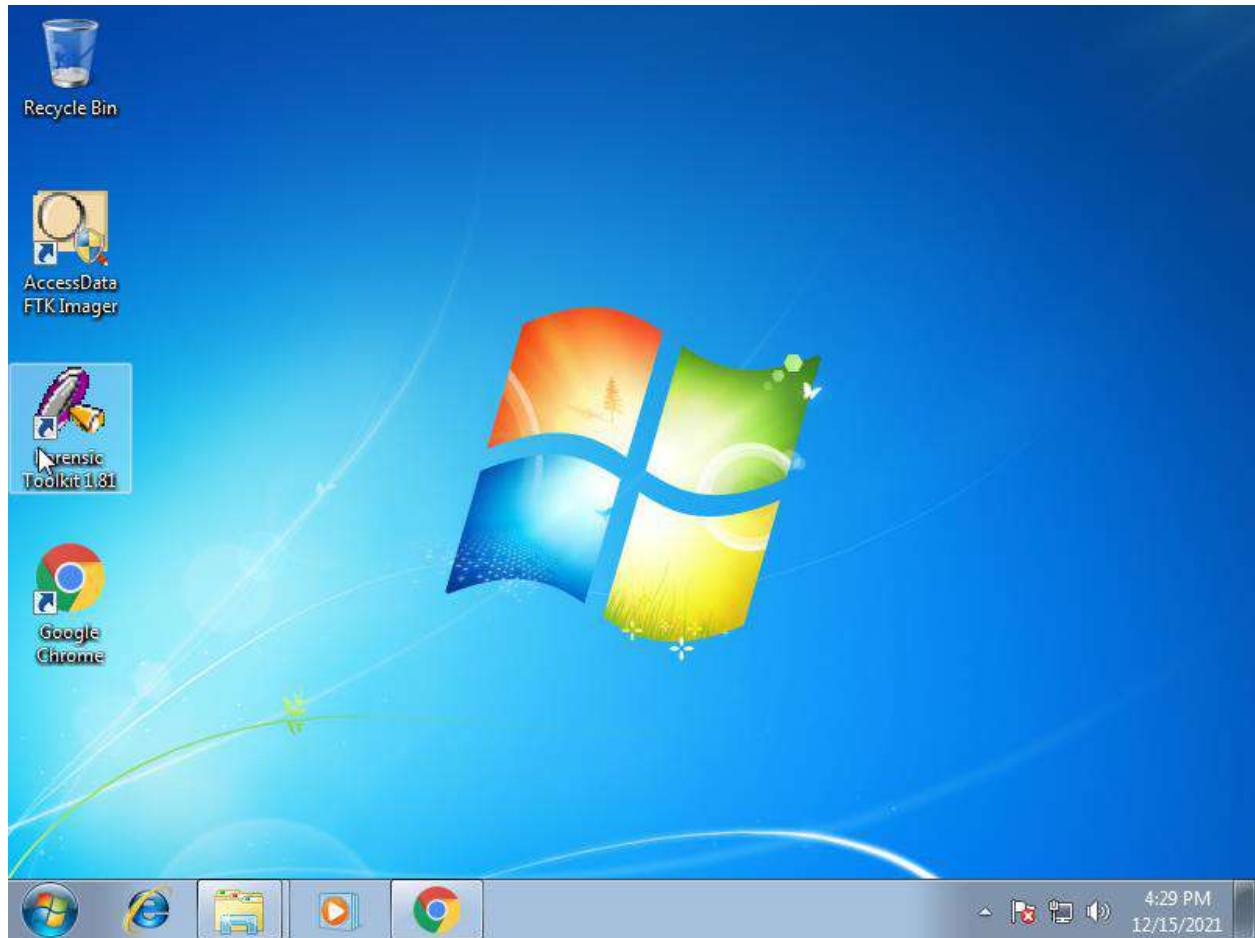
In this practical we will see how to create case, add evidence, generate reports.

After generating any case and adding evidences related to that case you can generate report by using the AccessData FTK tool.

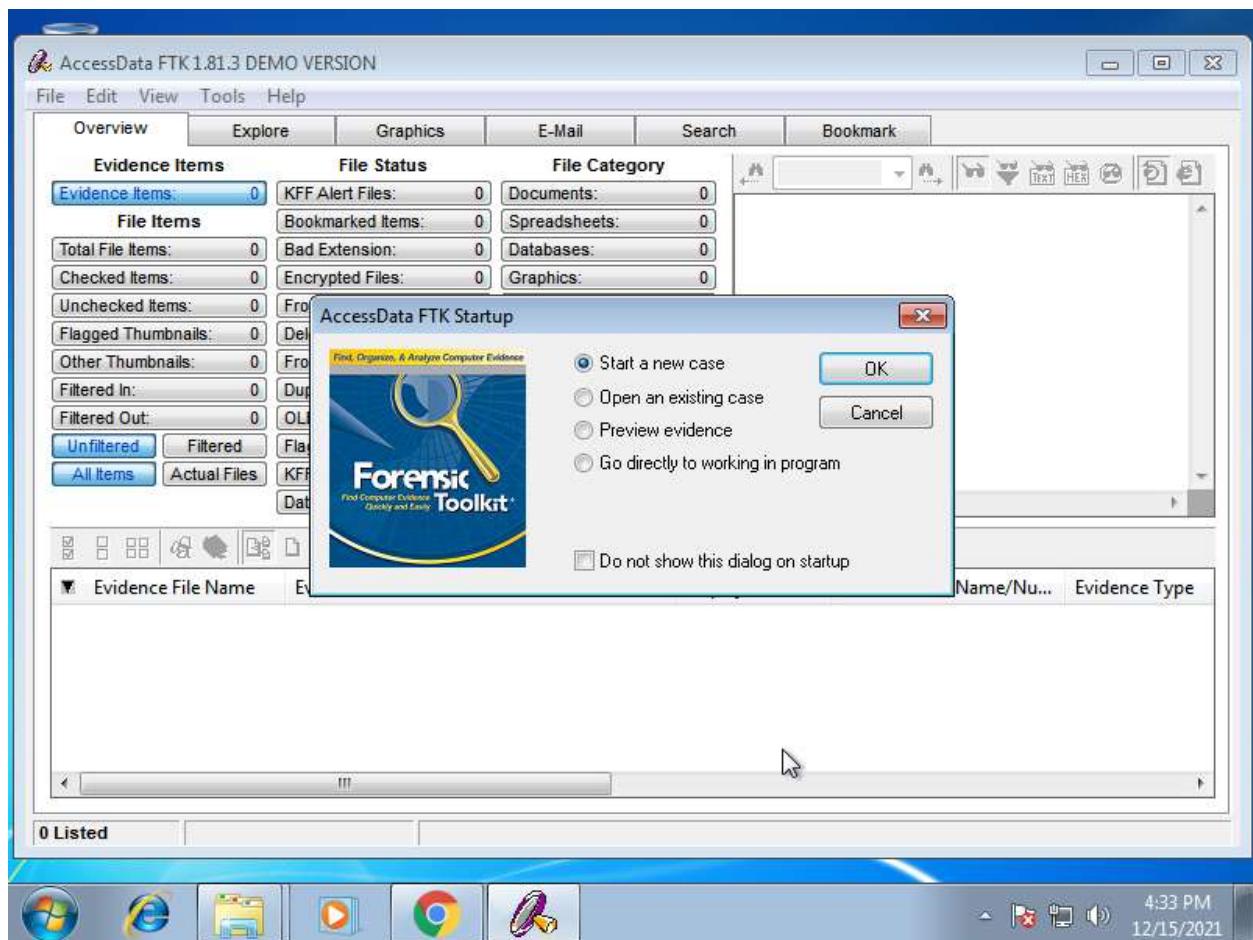
Following are the steps to create case add evidence and generate report using AccessData FTK tool.

To perform this practical you can take reference of Practical No. 08. In this I have added one case related evidences for that and generated reports for the case.

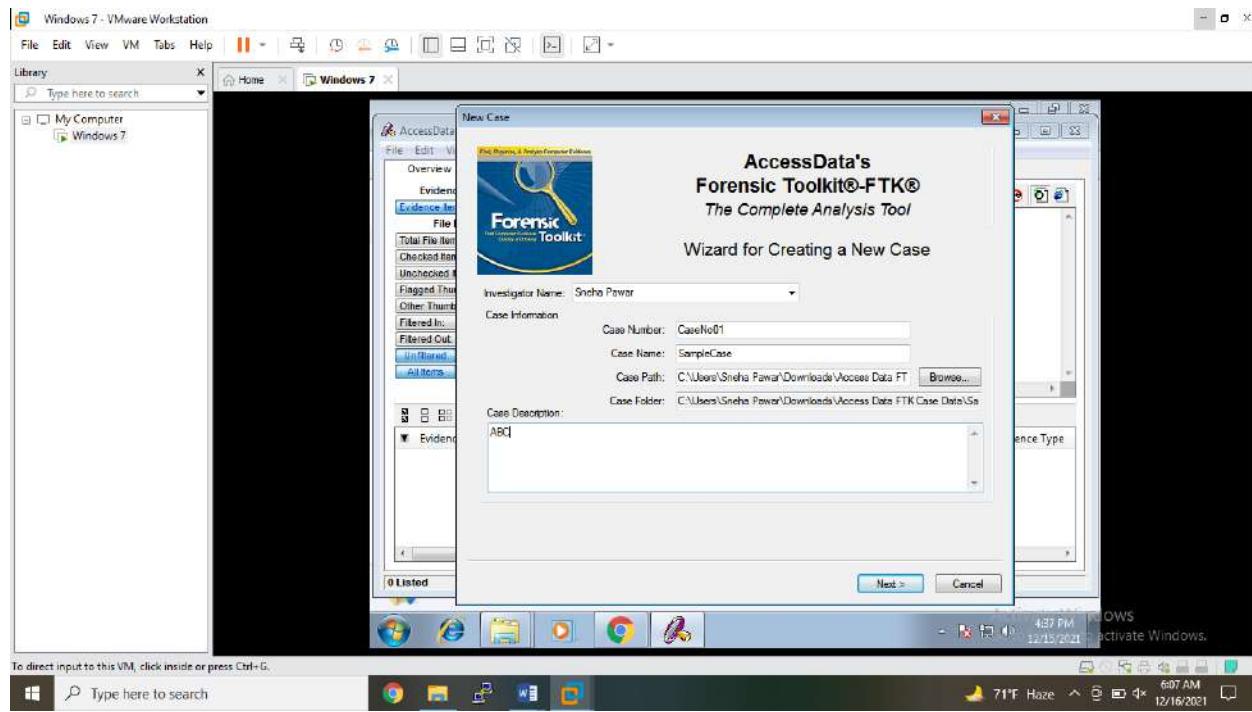
Start the forensic toolkit software.



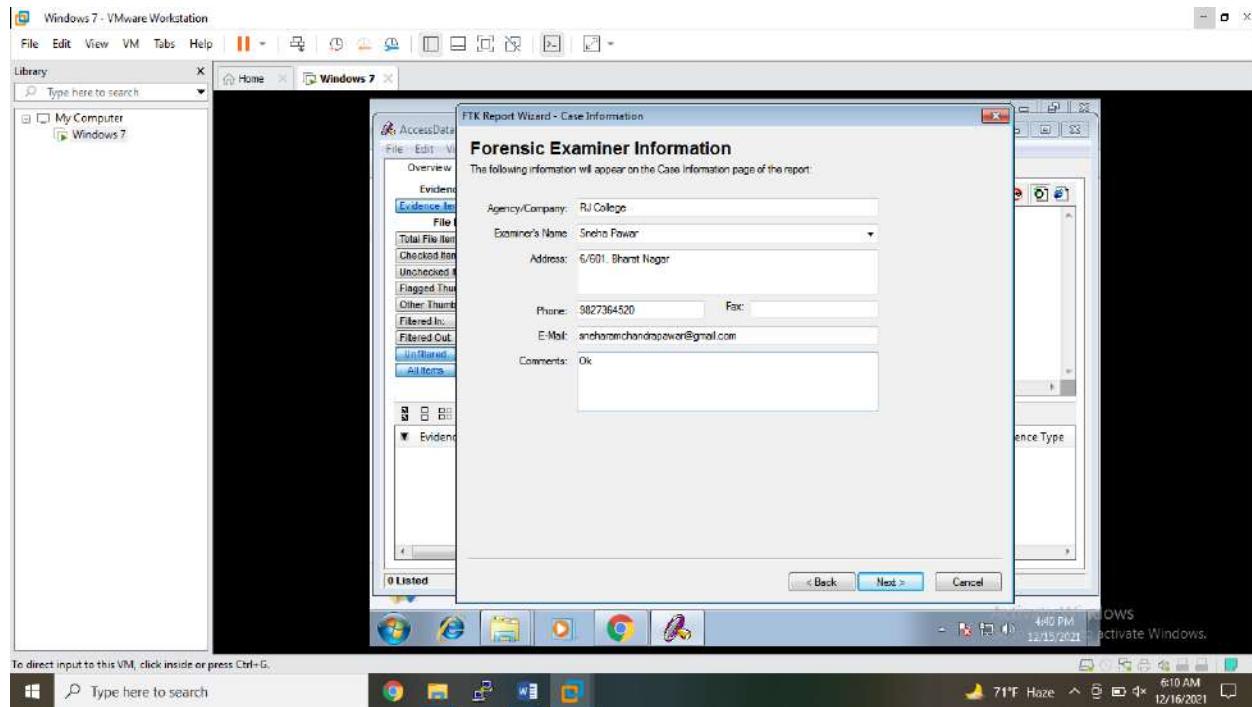
Select Start a New Case.



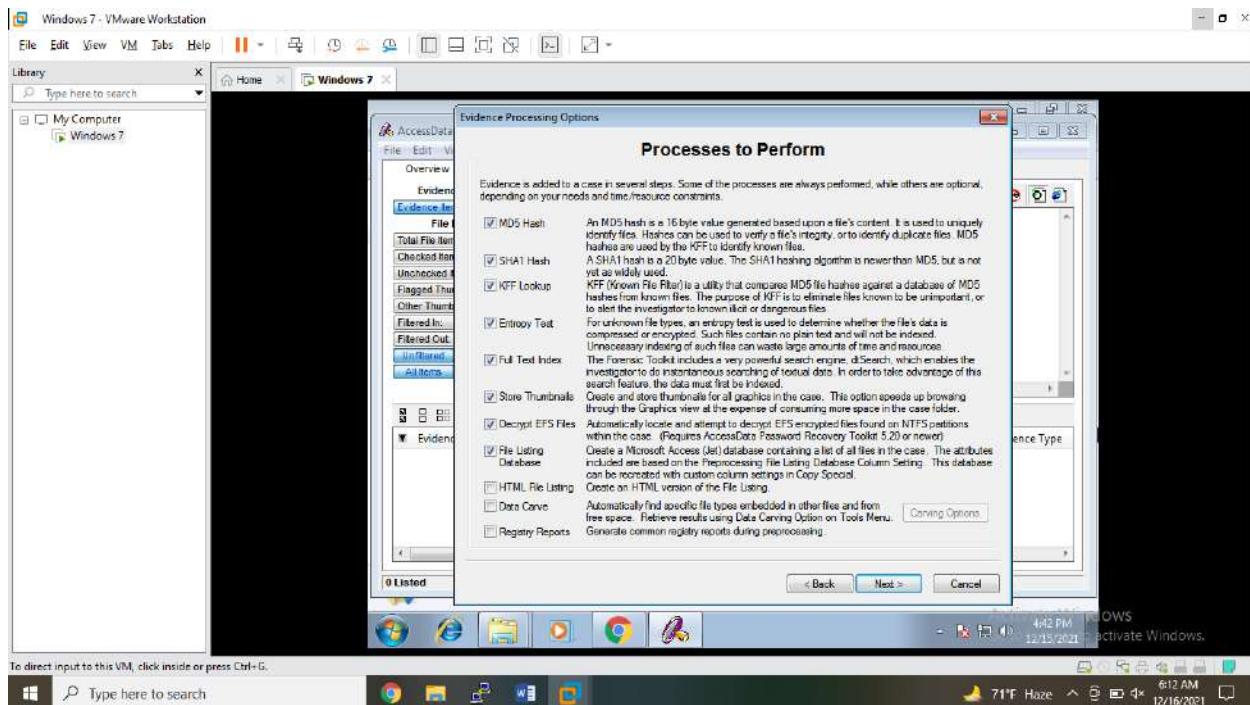
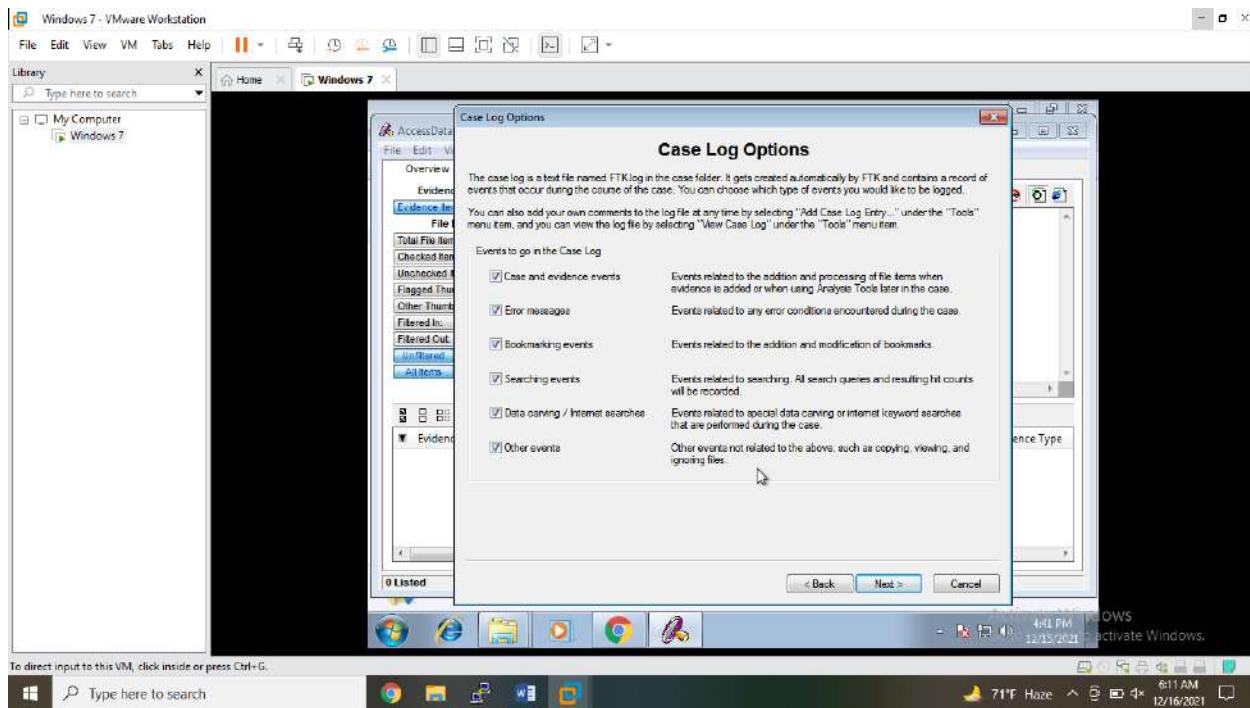
Then enter investigator's name and other details and click on Next.



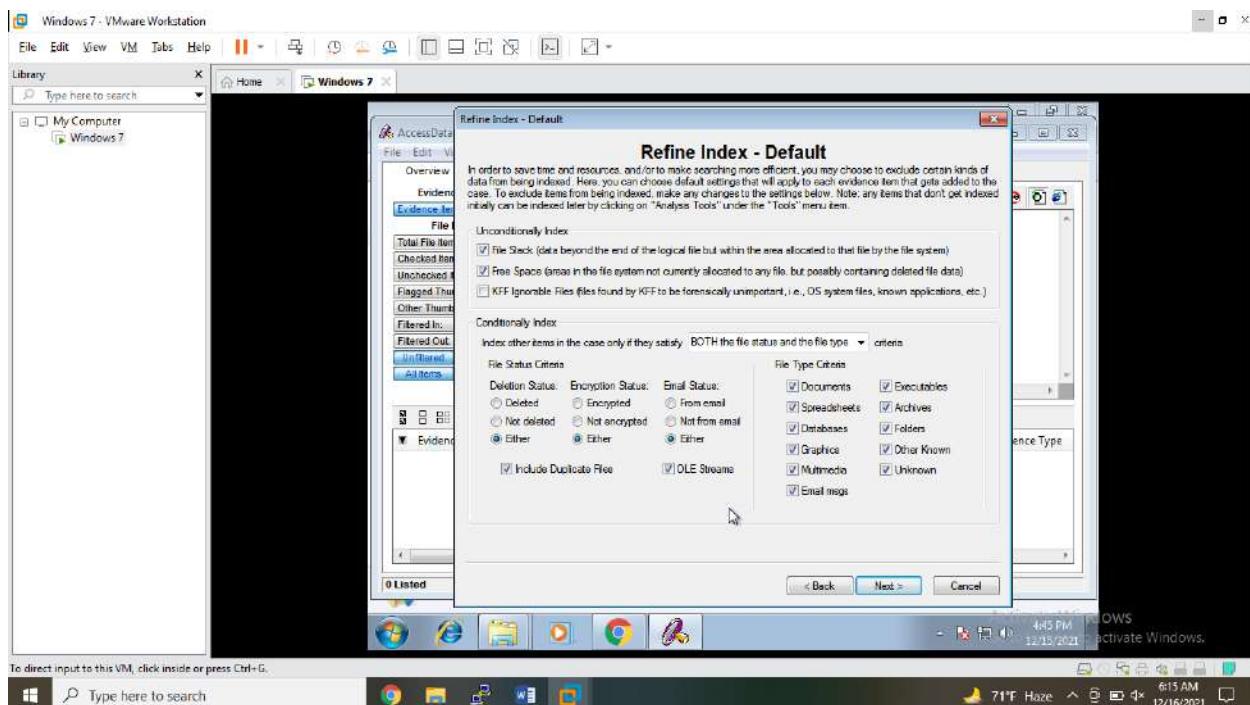
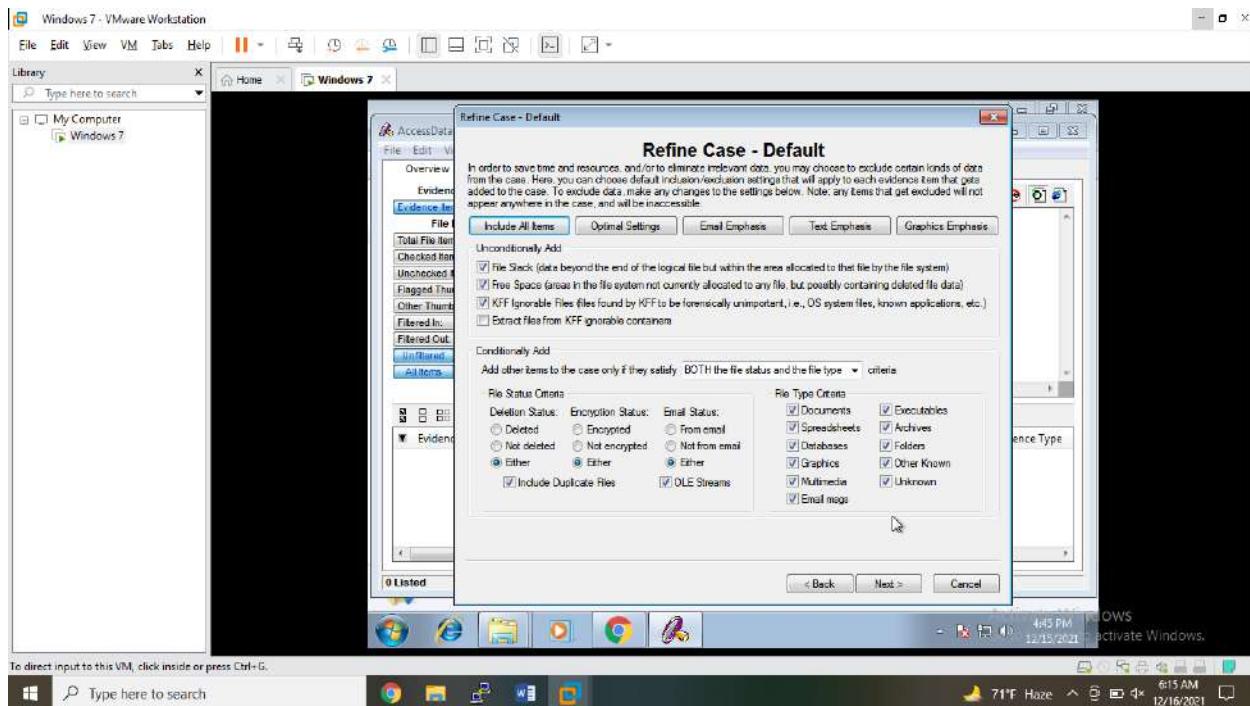
Then enter forensic examiner's details.



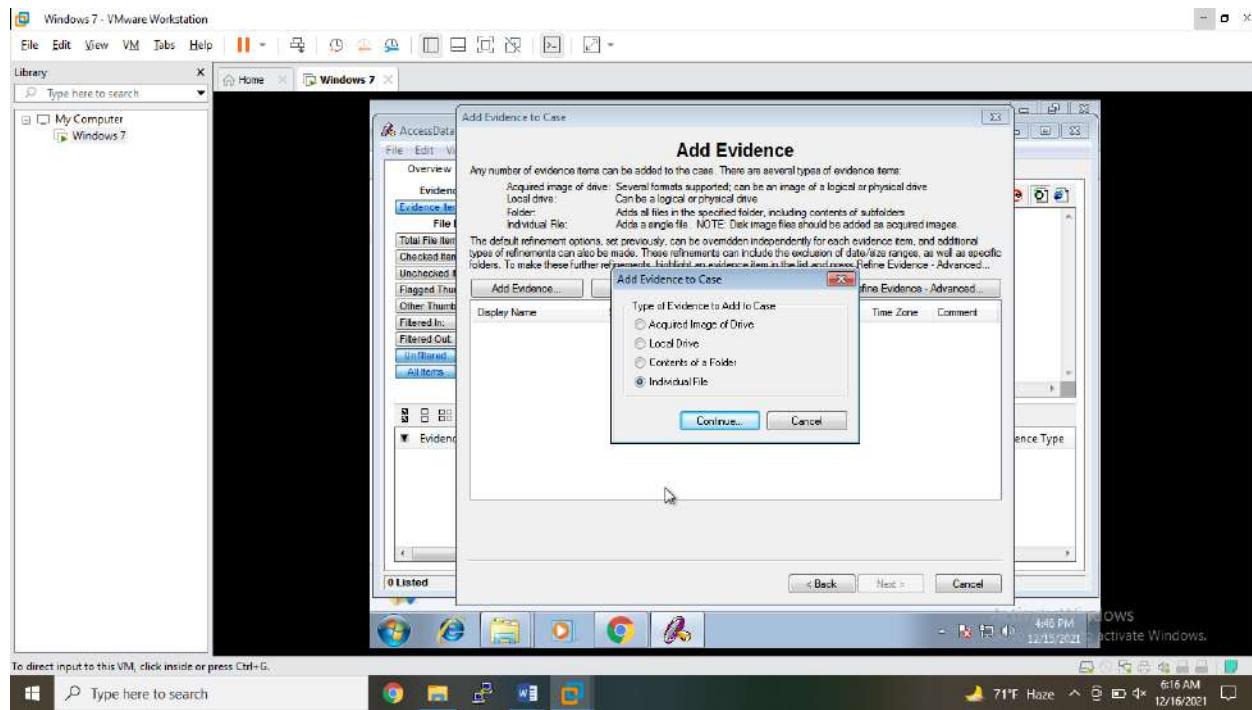
In Case Log Options & Process to perform tabs, keep everything by default.



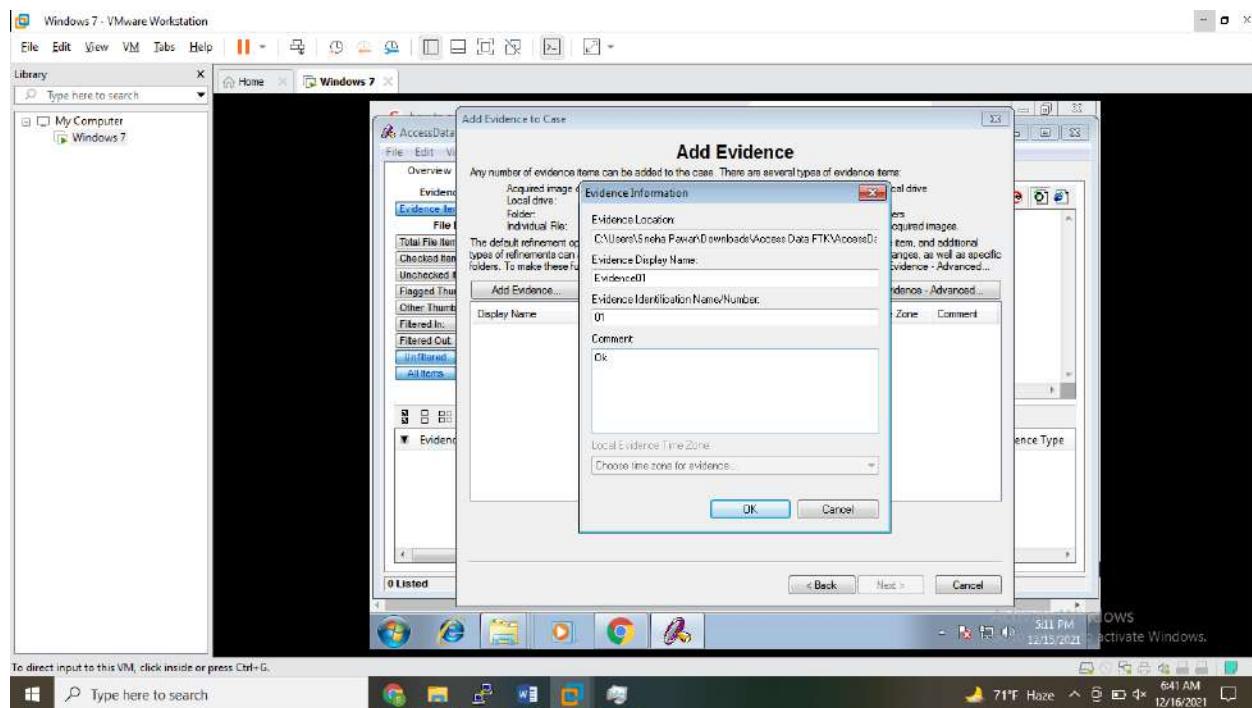
Then in Refine Case Default, Keep everything as it is, and click on Next.

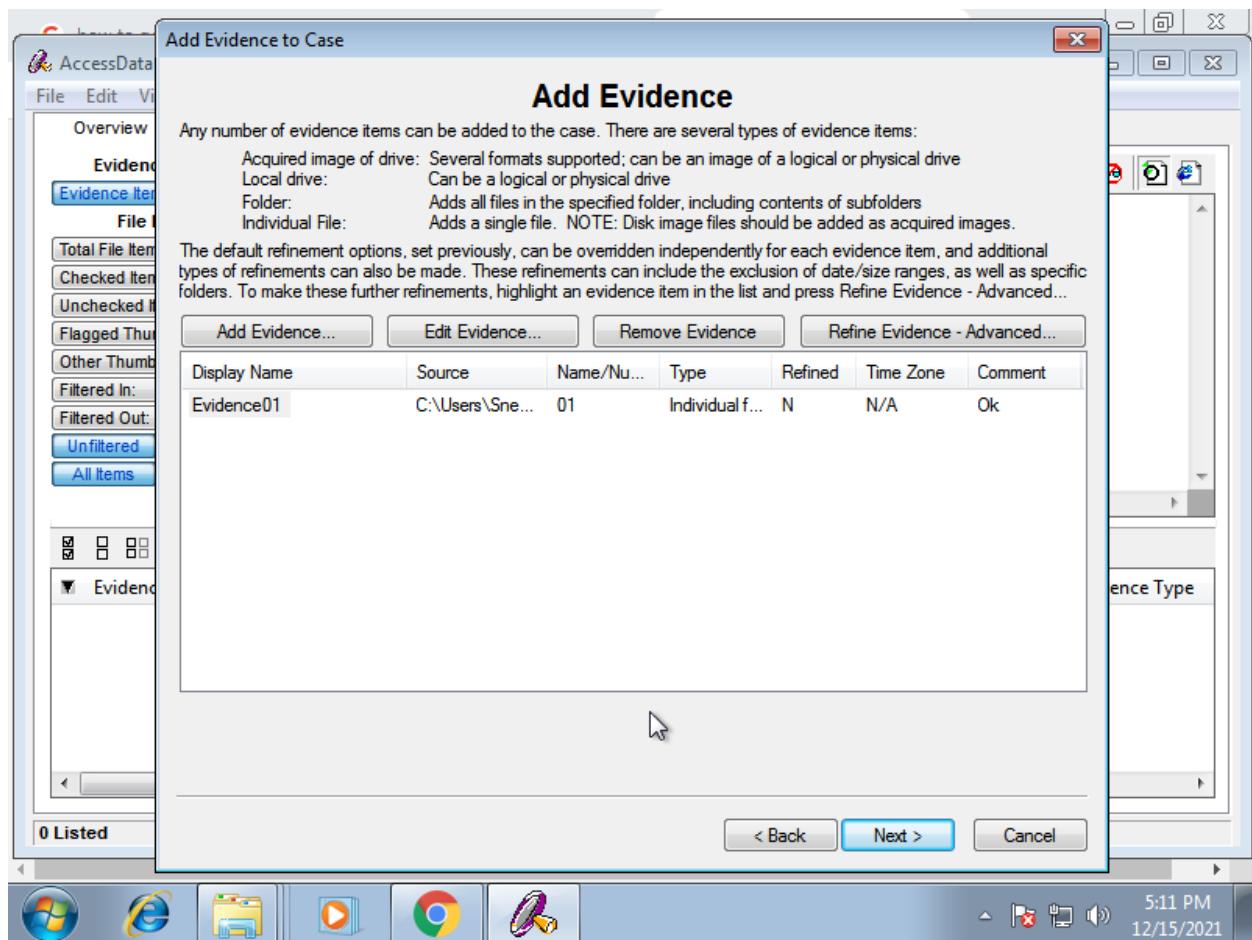


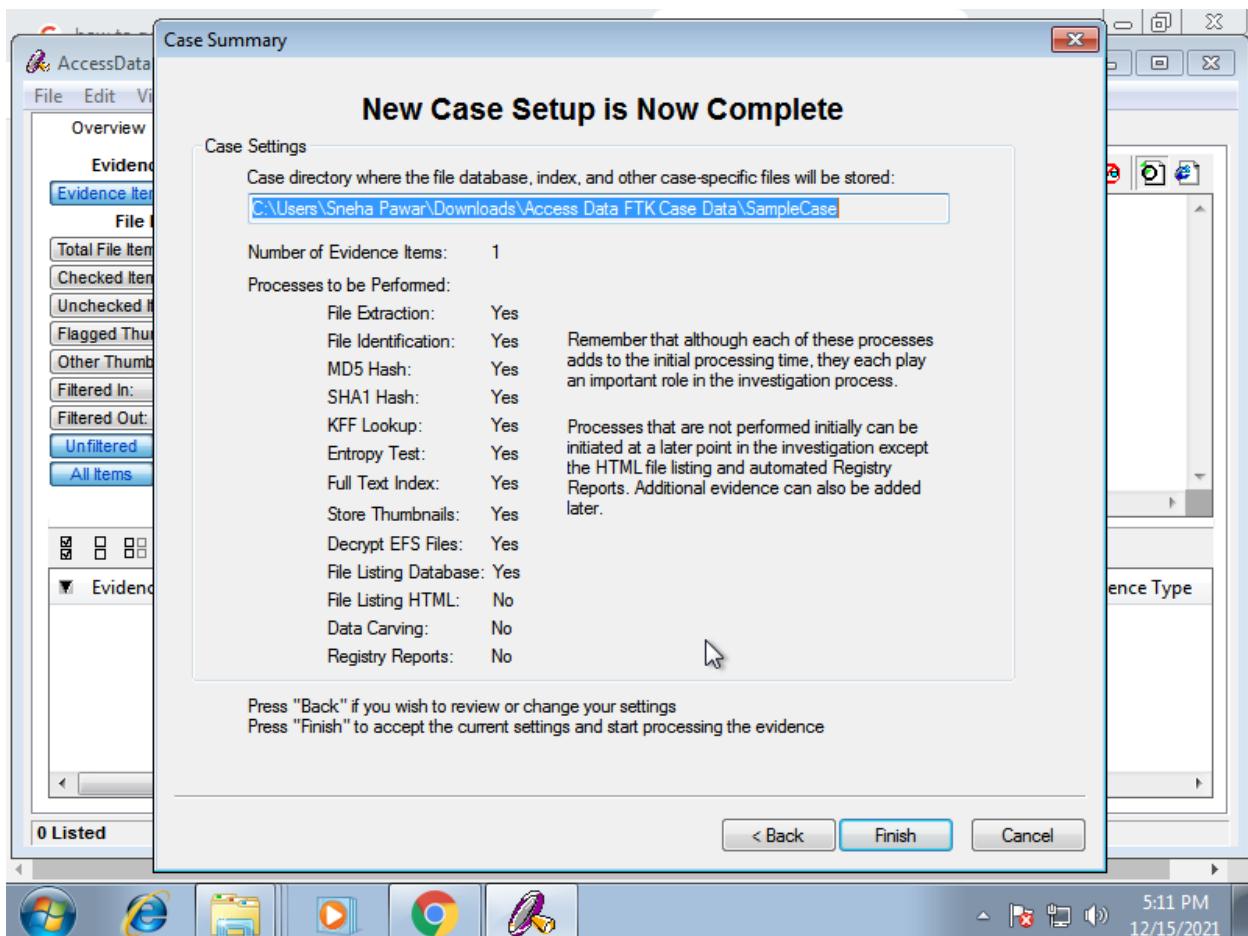
Then click on Add Evidence – Add Individual File.



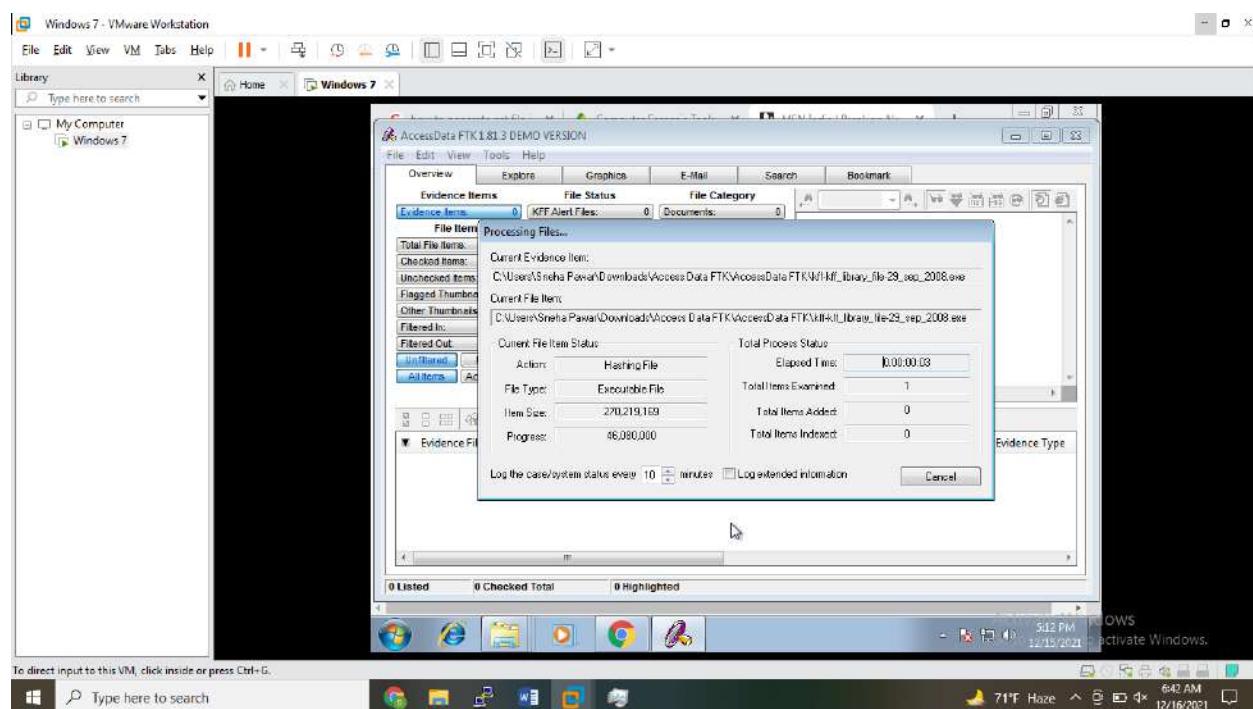
Then Browse for Evidence location, and enter other details.

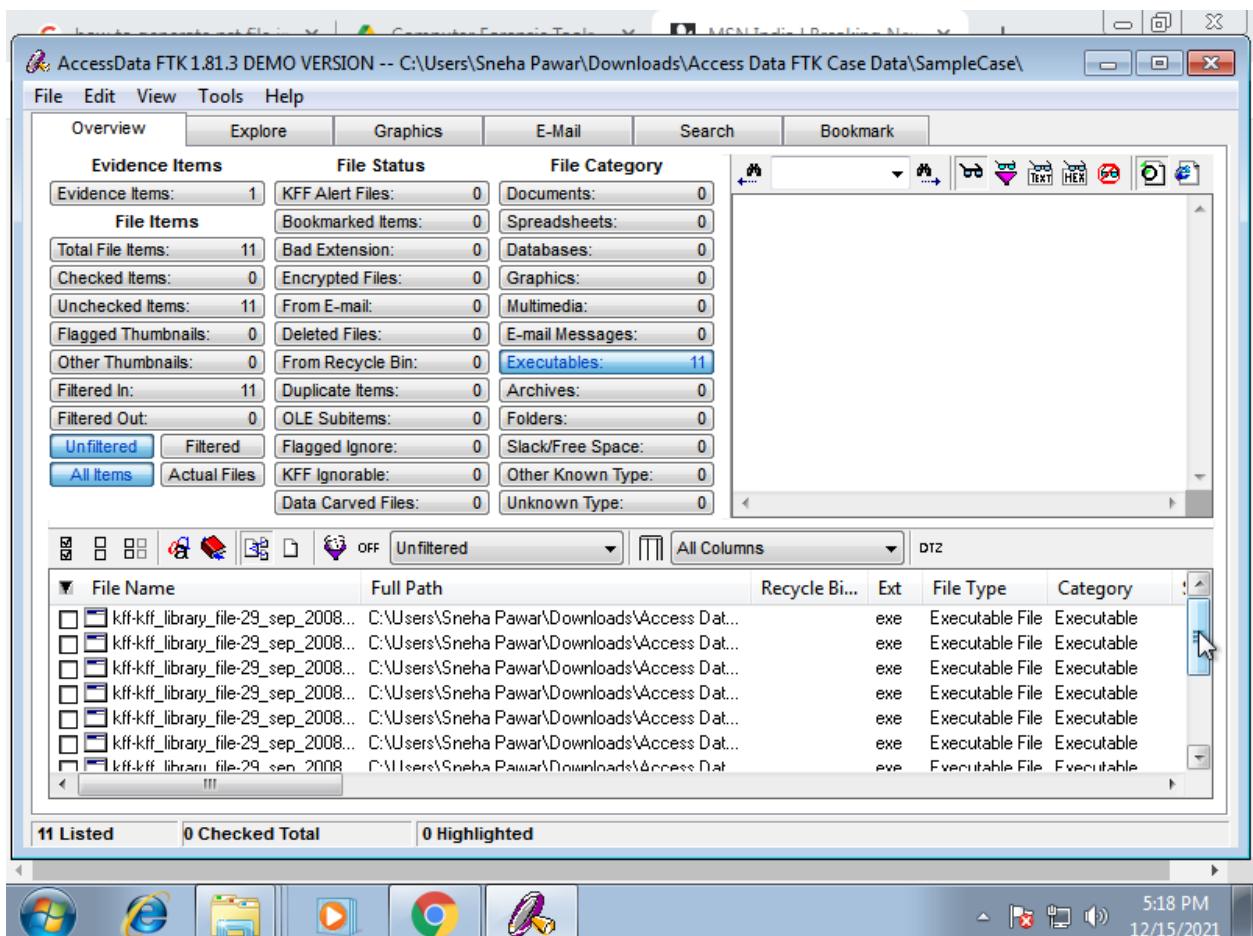
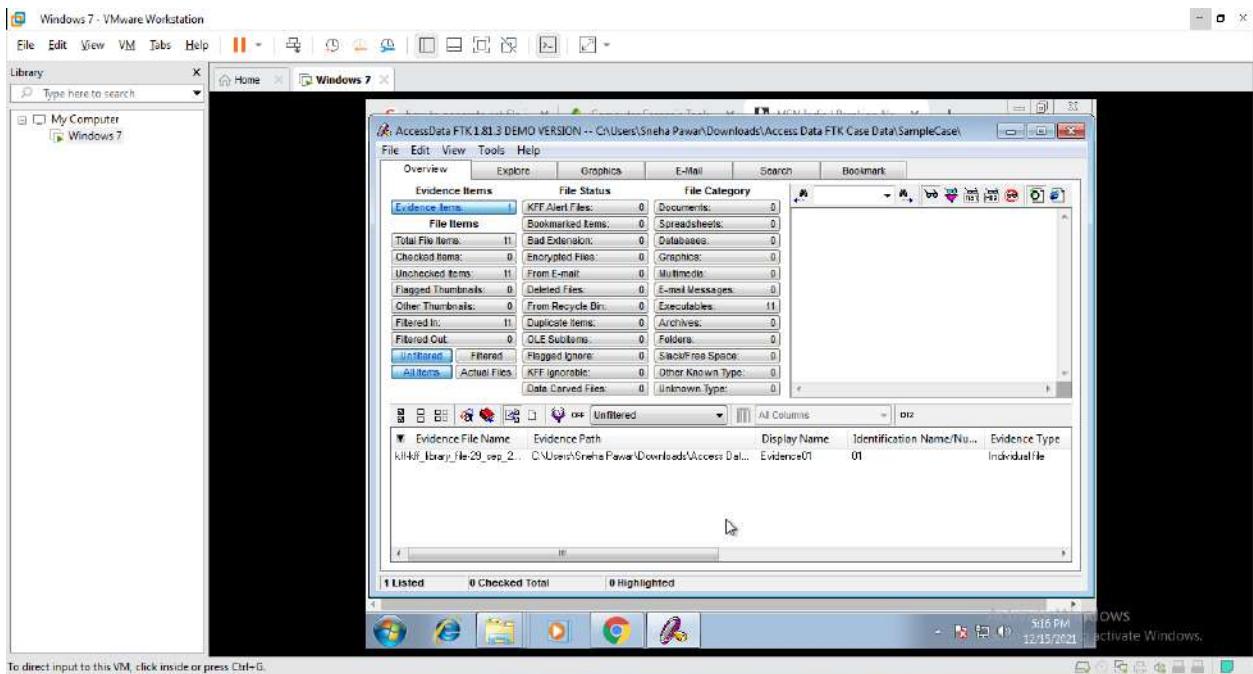




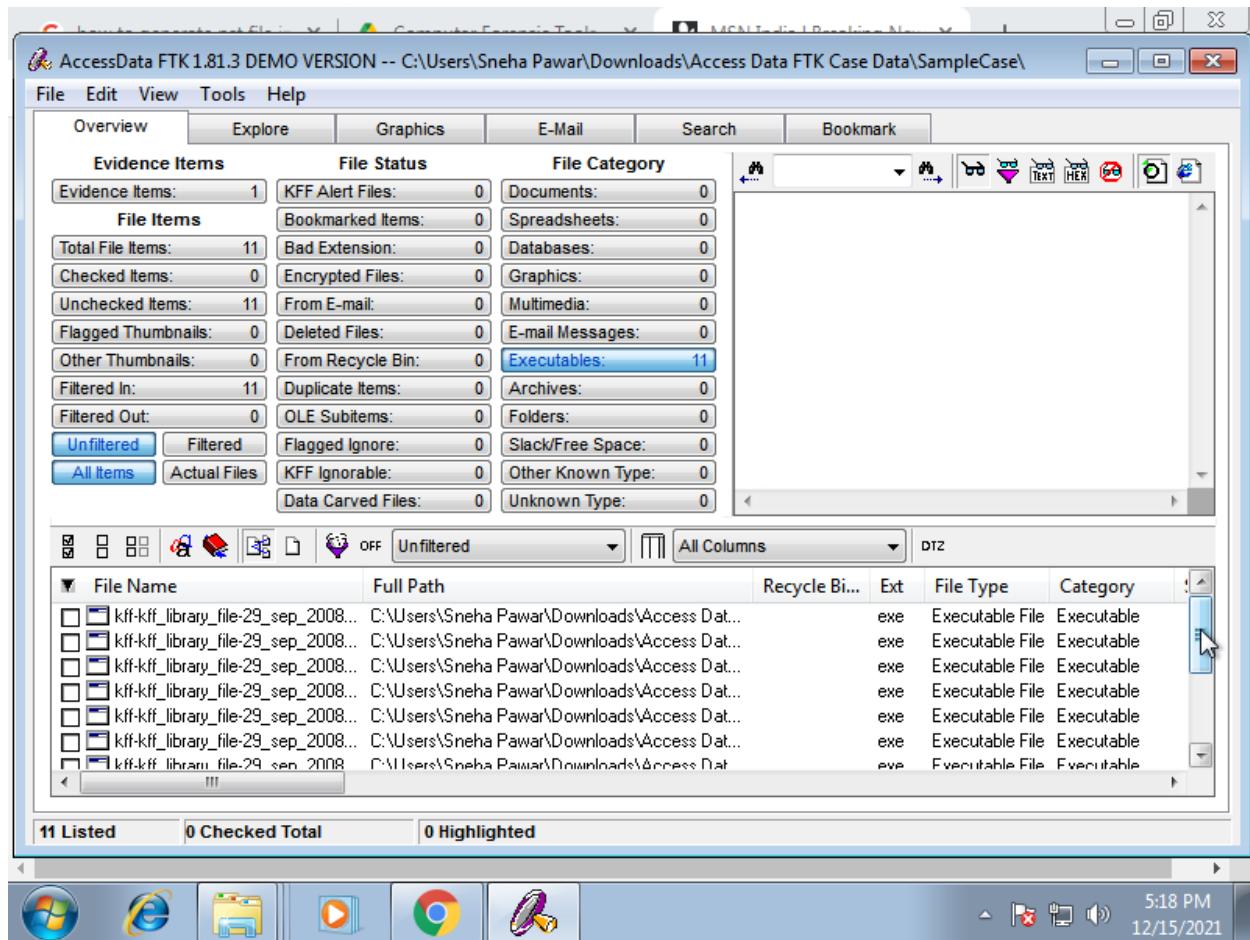


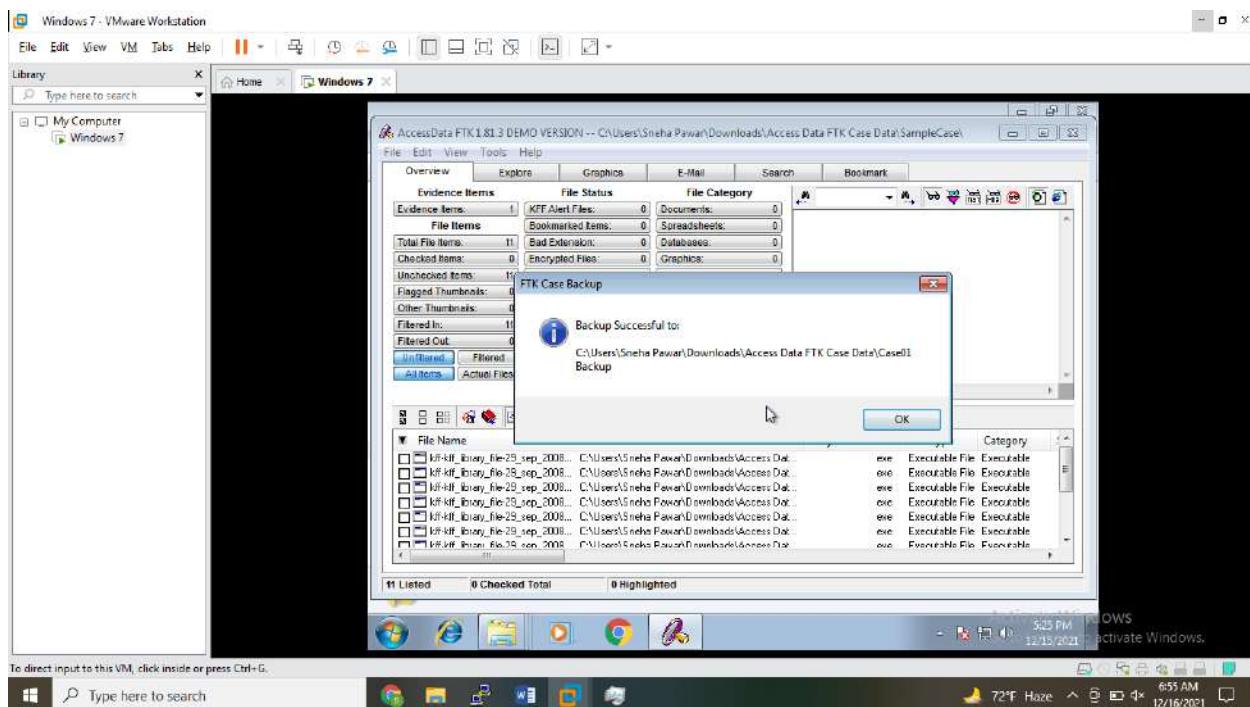
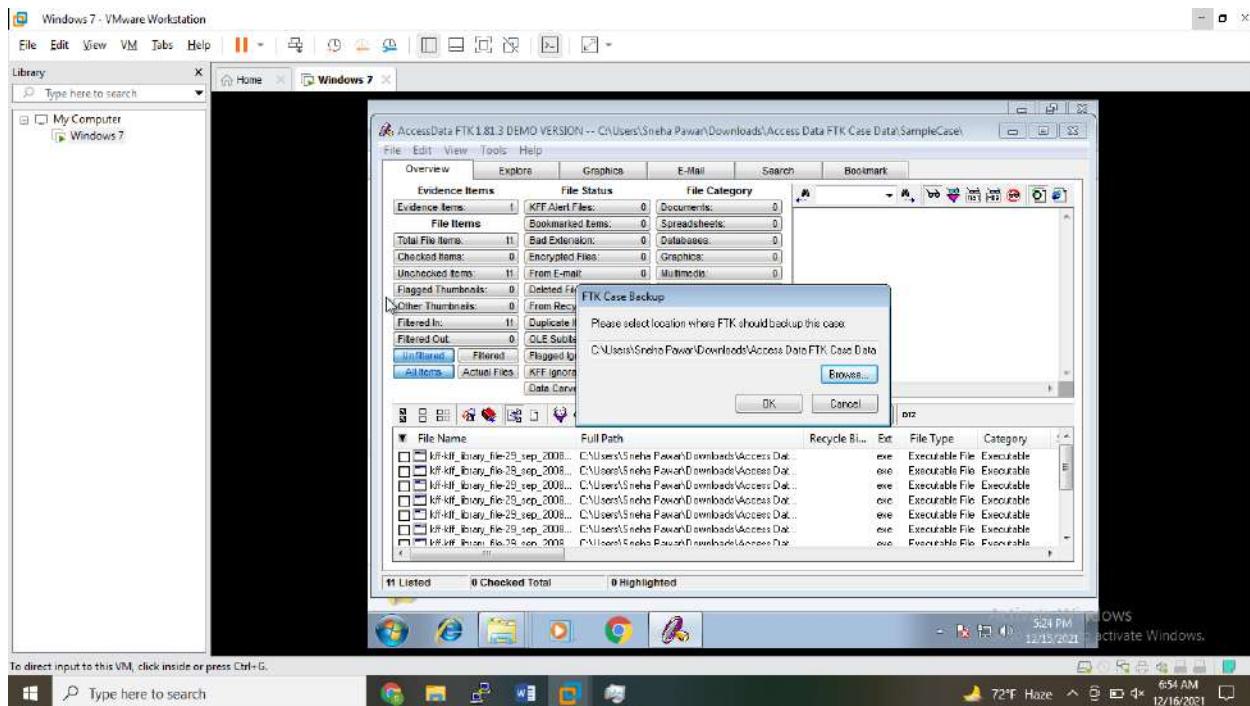
Click on Finish. It will start processing the File.





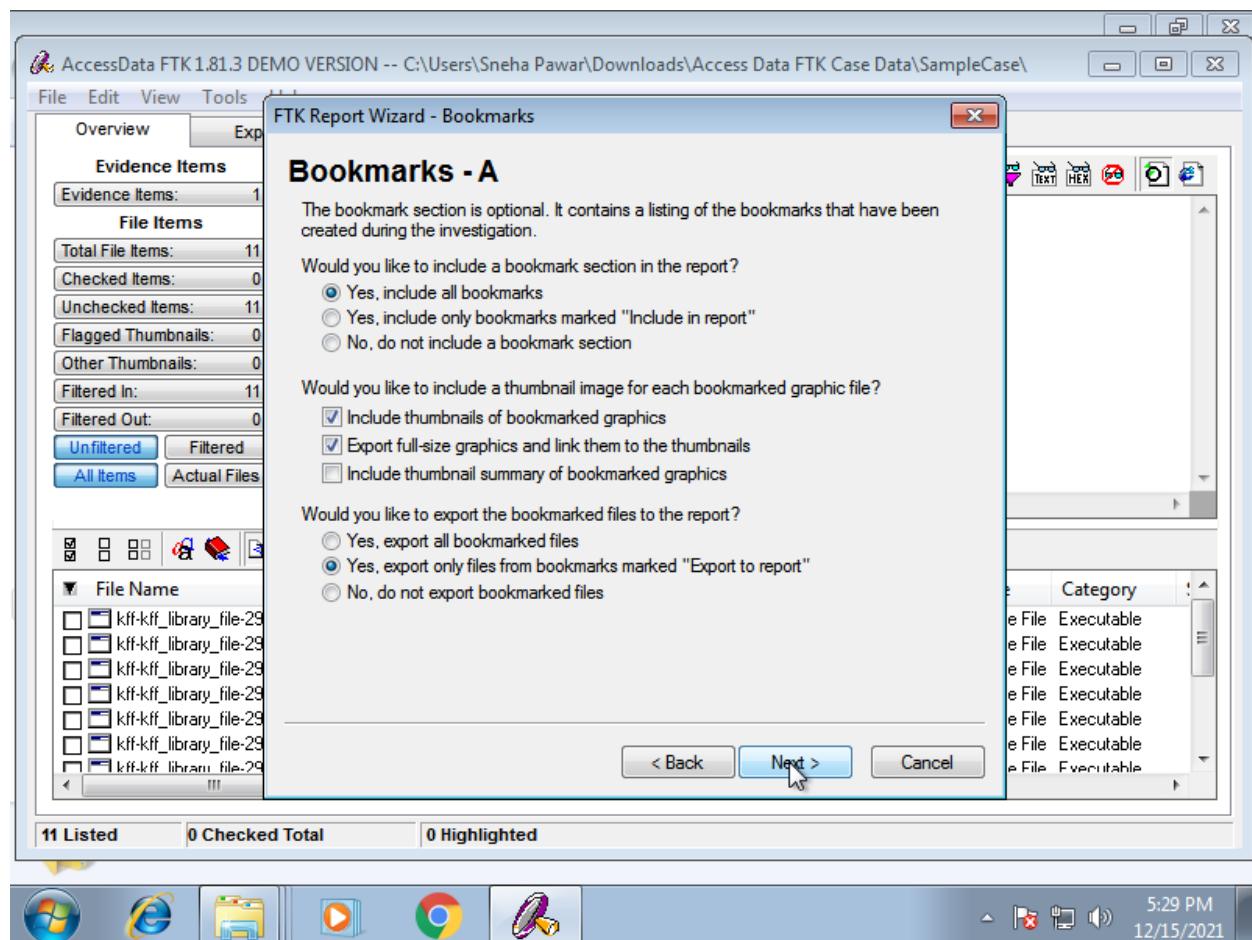
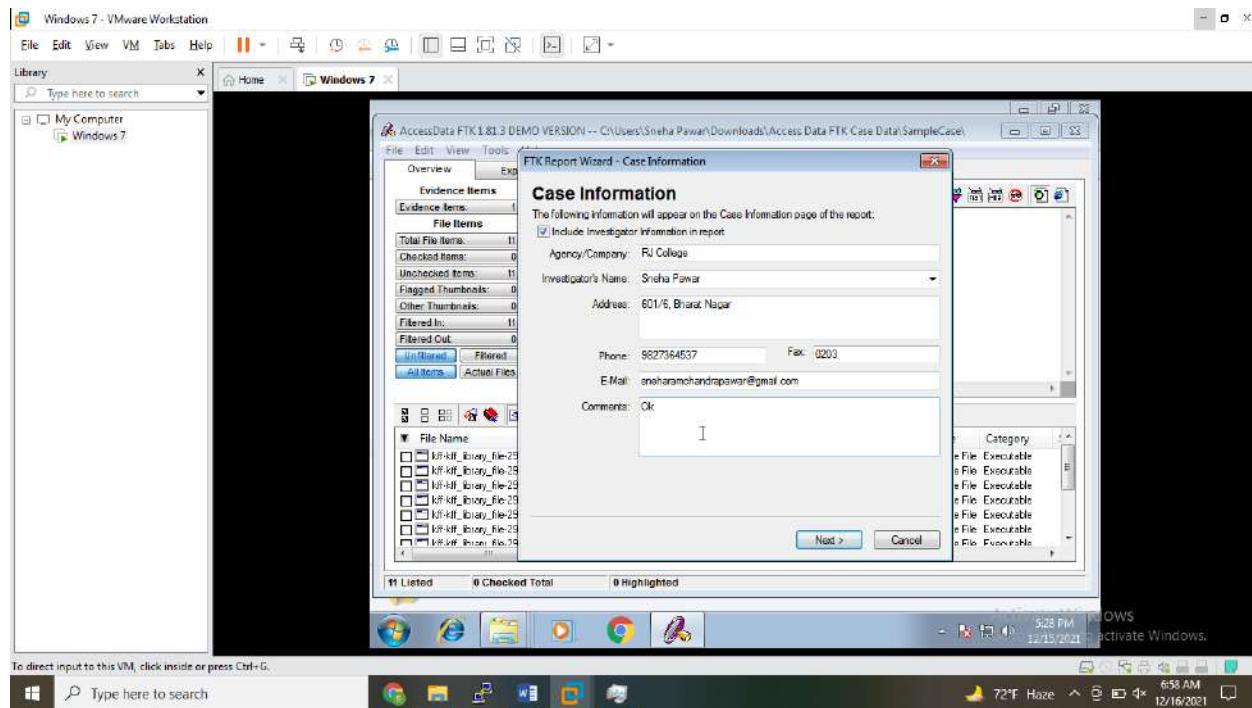
To take backup of your case, Click on File – Backup Case – And browse for location where you want to take backup.





Then click on File - Report Wizard.

Fill the details. And click on Next.



AccessData FTK 1.81.3 DEMO VERSION -- C:\Users\Sneha Pawar\Downloads\Access Data FTK Case Data\SampleCase

File Edit View Tools

FTK Report Wizard - Bookmarks

Bookmarks - B

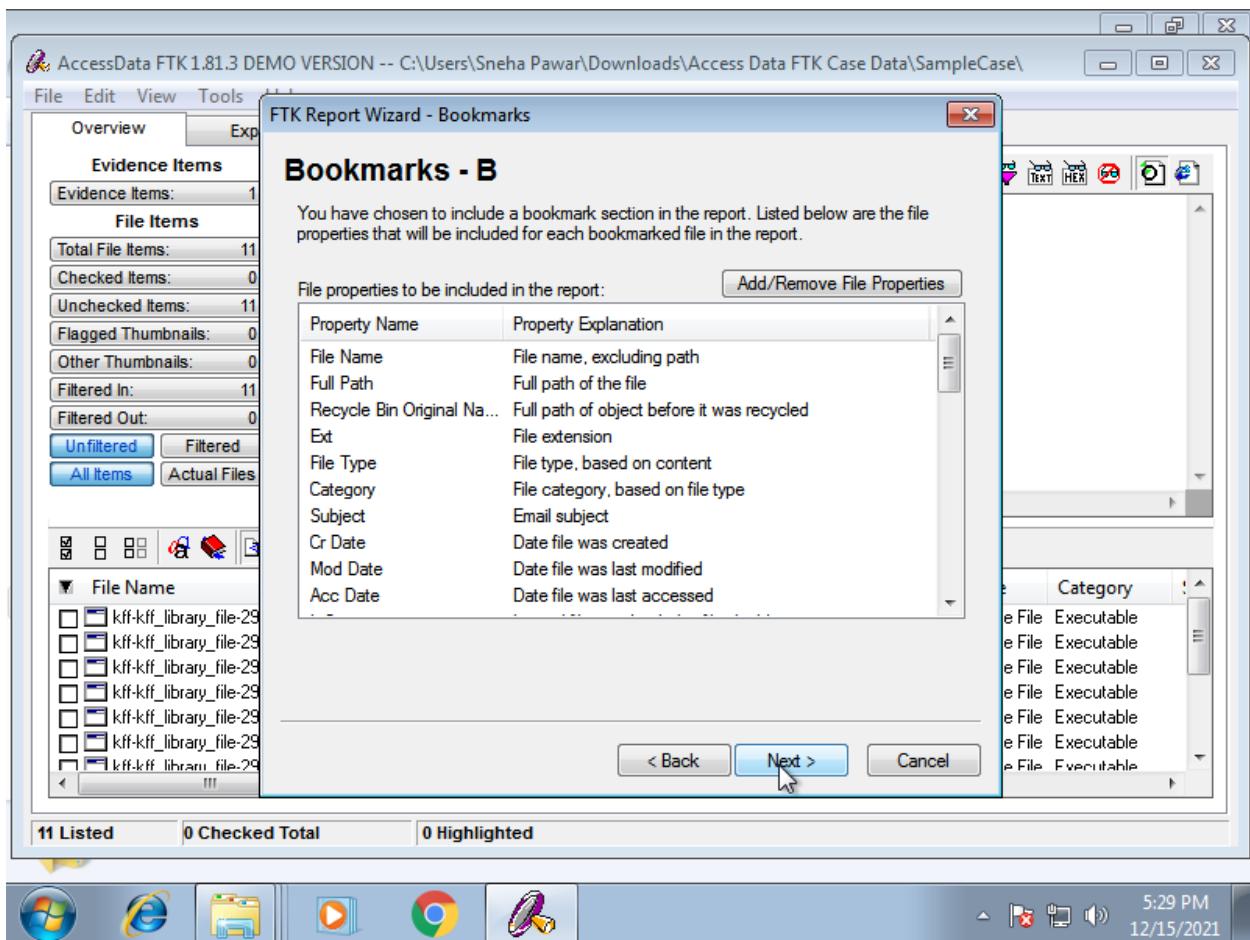
You have chosen to include a bookmark section in the report. Listed below are the file properties that will be included for each bookmarked file in the report.

File properties to be included in the report: [Add/Remove File Properties](#)

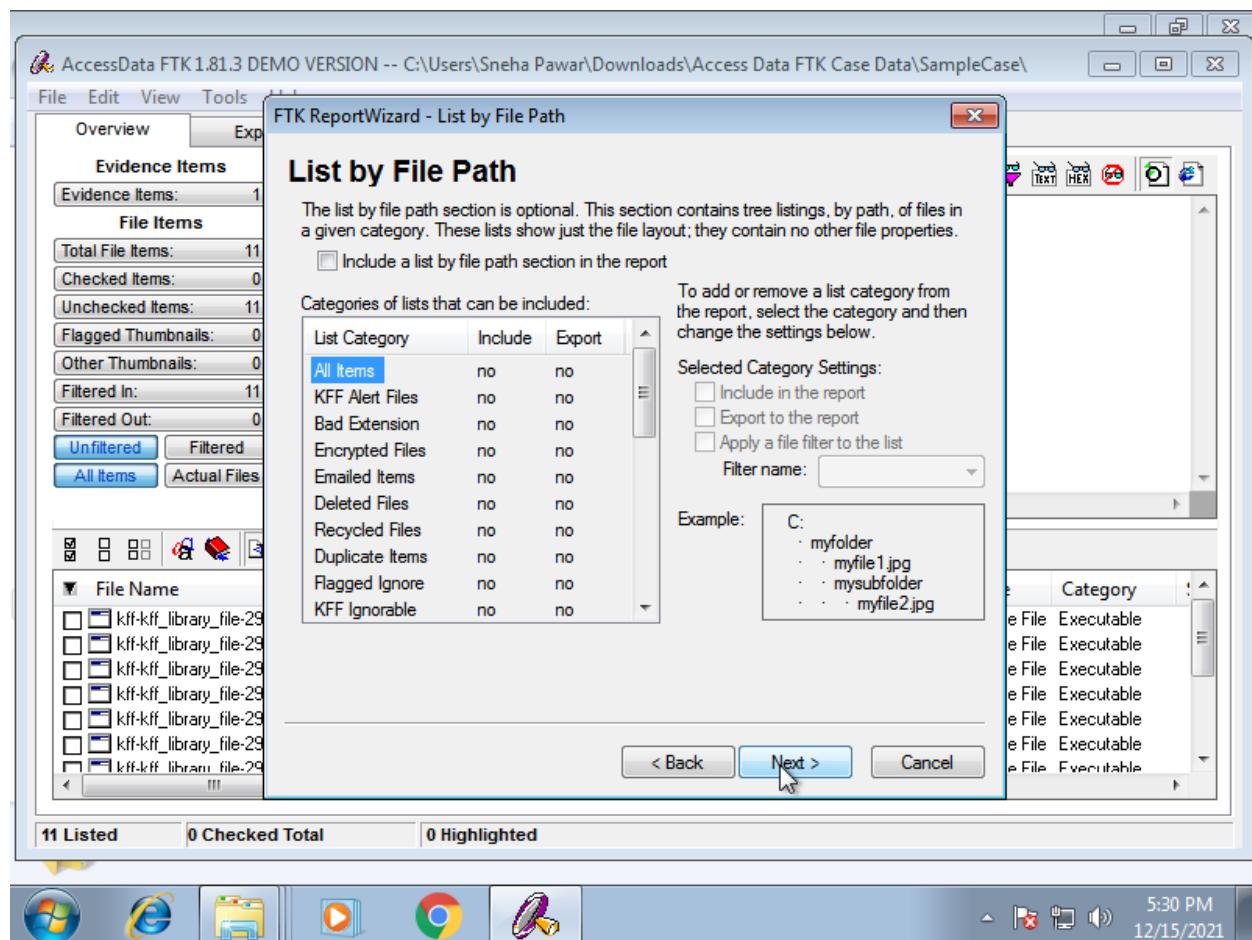
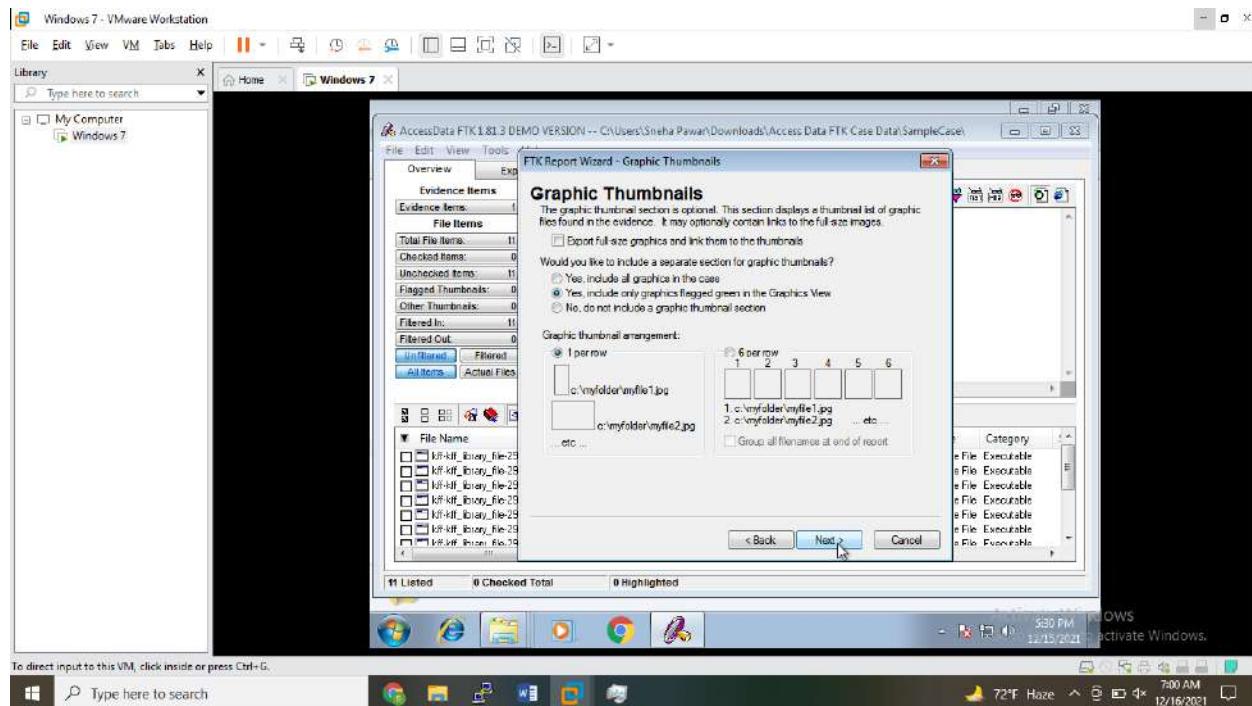
Property Name	Property Explanation
File Name	File name, excluding path
Full Path	Full path of the file
Recycle Bin Original Na...	Full path of object before it was recycled
Ext	File extension
File Type	File type, based on content
Category	File category, based on file type
Subject	Email subject
Cr Date	Date file was created
Mod Date	Date file was last modified
Acc Date	Date file was last accessed

< Back [Next >](#) Cancel

11 Listed 0 Checked Total 0 Highlighted



5:29 PM
12/15/2021



AccessData FTK 1.81.3 DEMO VERSION -- C:\Users\Sneha Pawar\Downloads\Access Data FTK Case Data\SampleCase

File Edit View Tools

Evidence Items

Evidence Items: 1

File Items

Total File Items: 11
Checked Items: 0
Unchecked Items: 11
Flagged Thumbnails: 0
Other Thumbnails: 0
Filtered In: 11
Filtered Out: 0
Unfiltered Filtered
All Items Actual Files

Include a list file properties section in the report
 Include MS Access database in report

Categories of lists to be included in the report:

List Category	Include	Export
All Items	no	no
KFF Alert Files	no	no
Bad Extension	no	no
Encrypted Files	no	no
Emailed Items	no	no
Deleted Files	no	no
Recycled Files	no	no
Duplicate Items	no	no
Flagged Ignore	no	no
KFF Ignorable	no	no

To add or remove a list category from the report, select the category and then change its settings below.

Selected Category Settings:

- Include in the report
- Export to the report
- Apply a file filter to the list

Filter name:

Example:

```
File: myfile1.jpg
Path: C:\myfolder
File Type: JPEG/JFIF File
Category: Graphic
L-Size: 37942
```

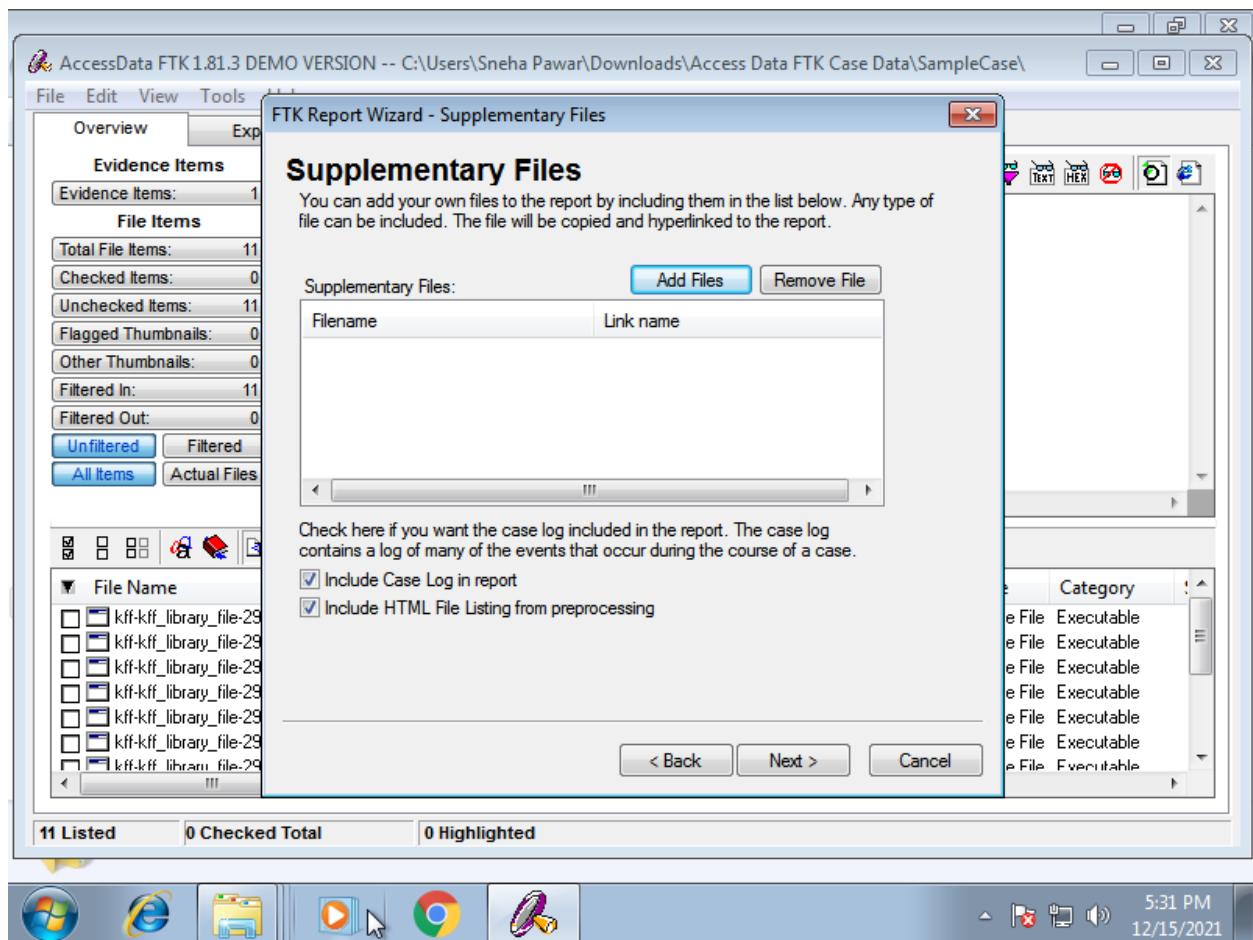
< Back Next > Cancel

11 Listed 0 Checked Total 0 Highlighted

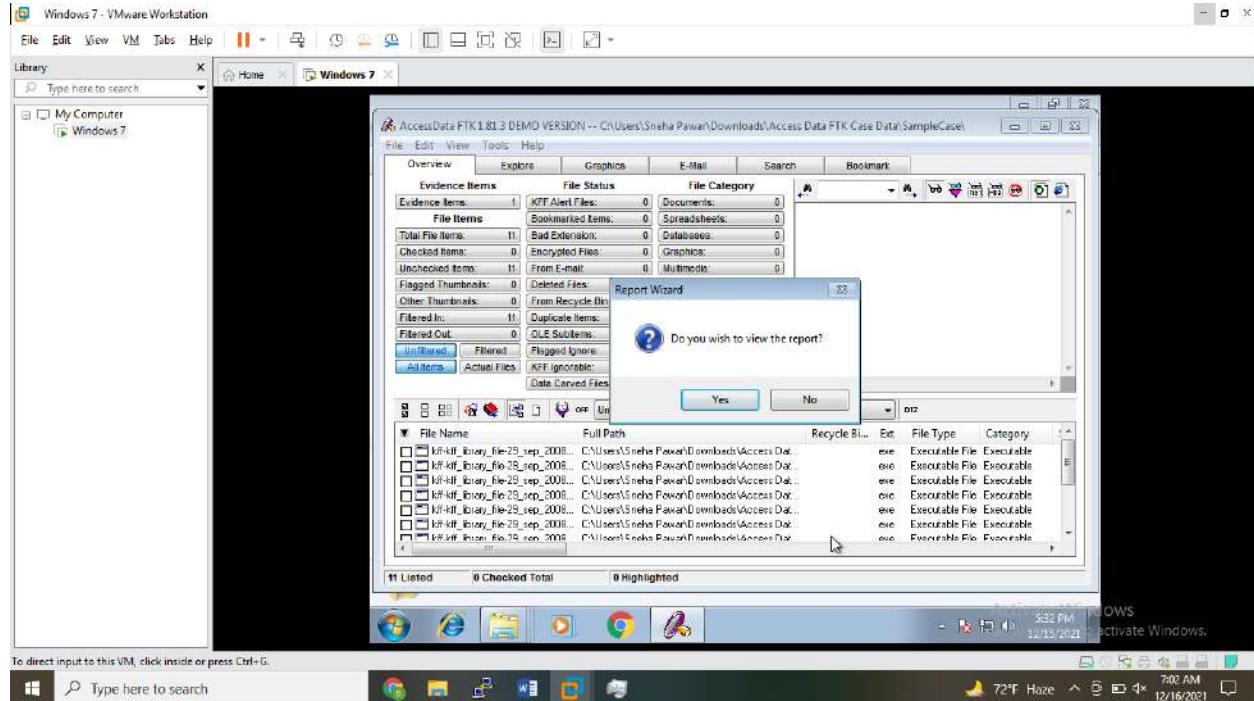
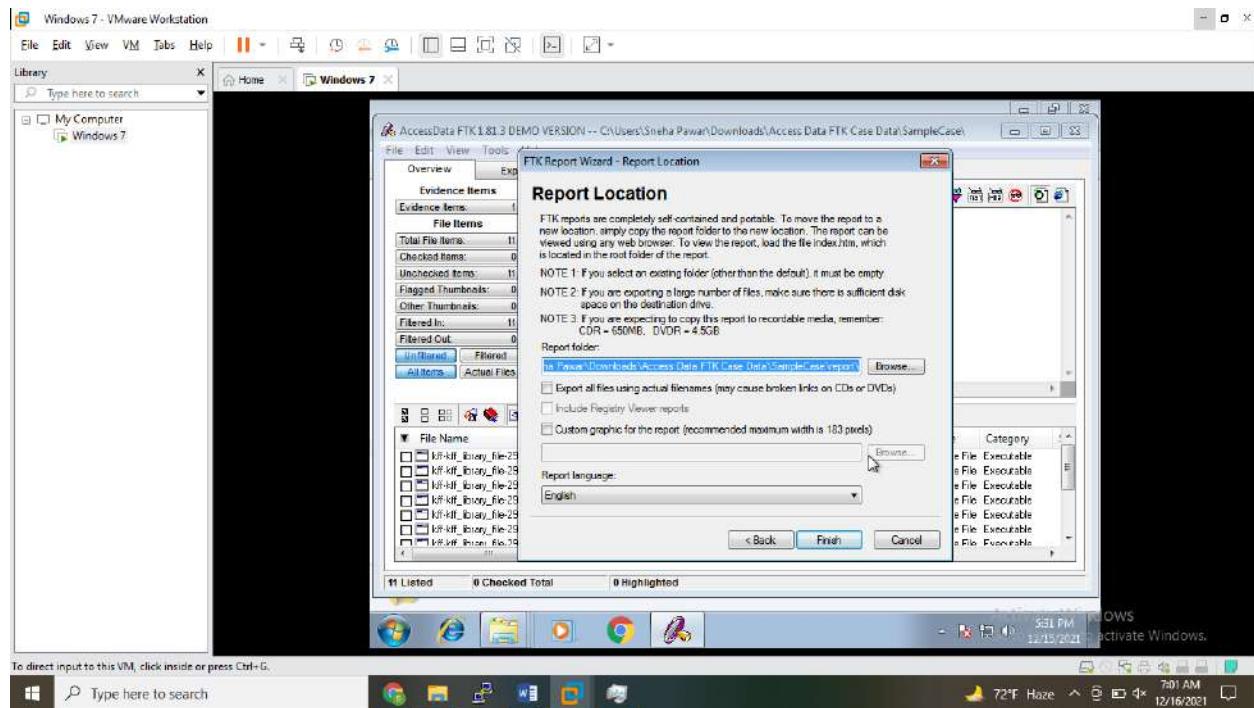
Category

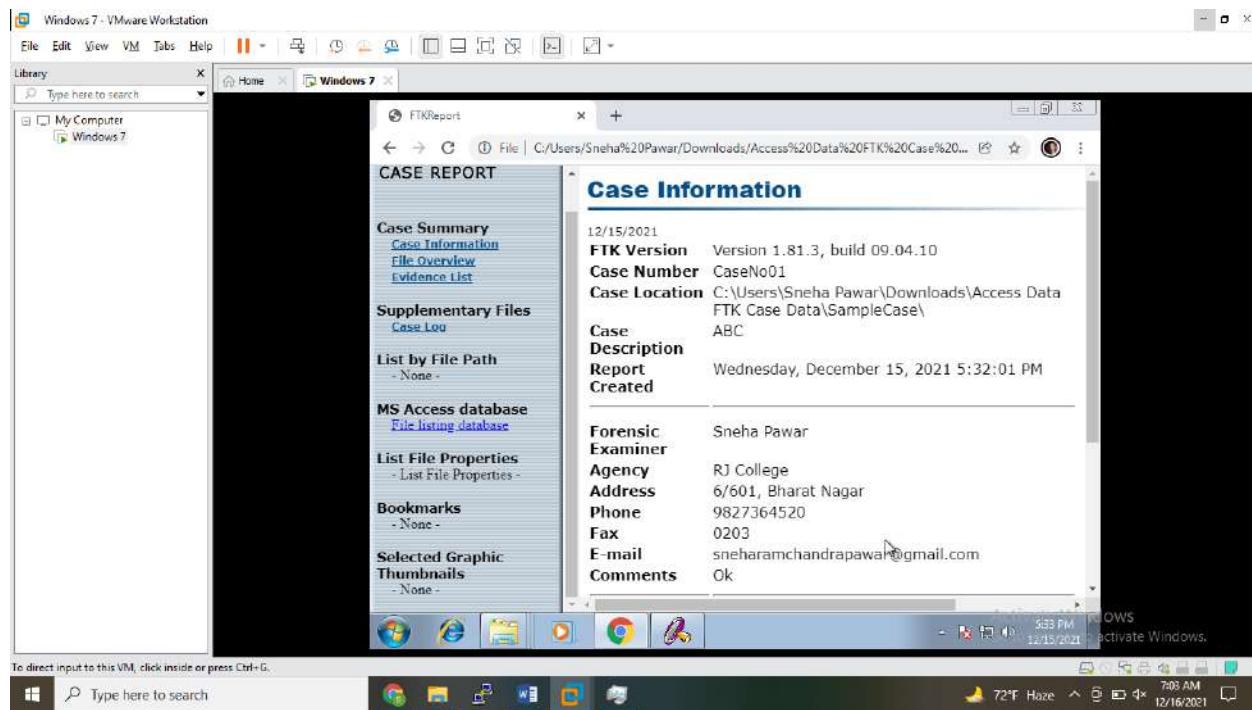
File Executable
File Executable
File Executable
File Executable
File Executable
File Executable
File Executable

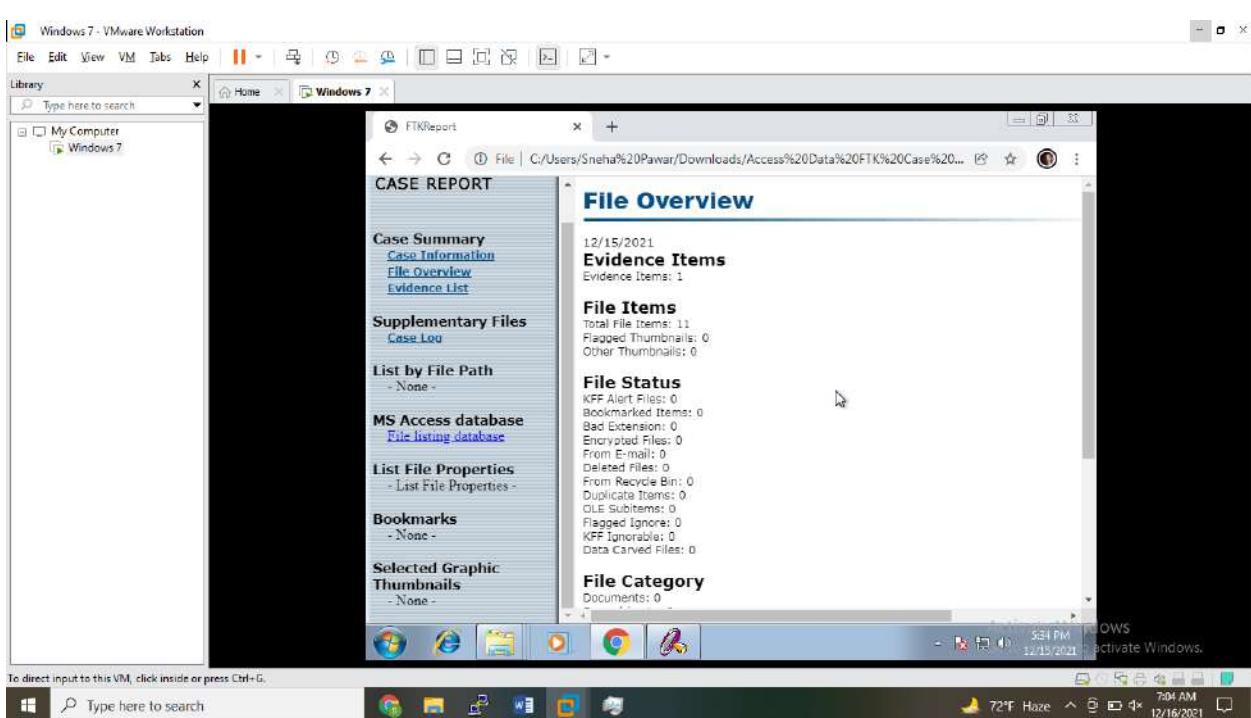
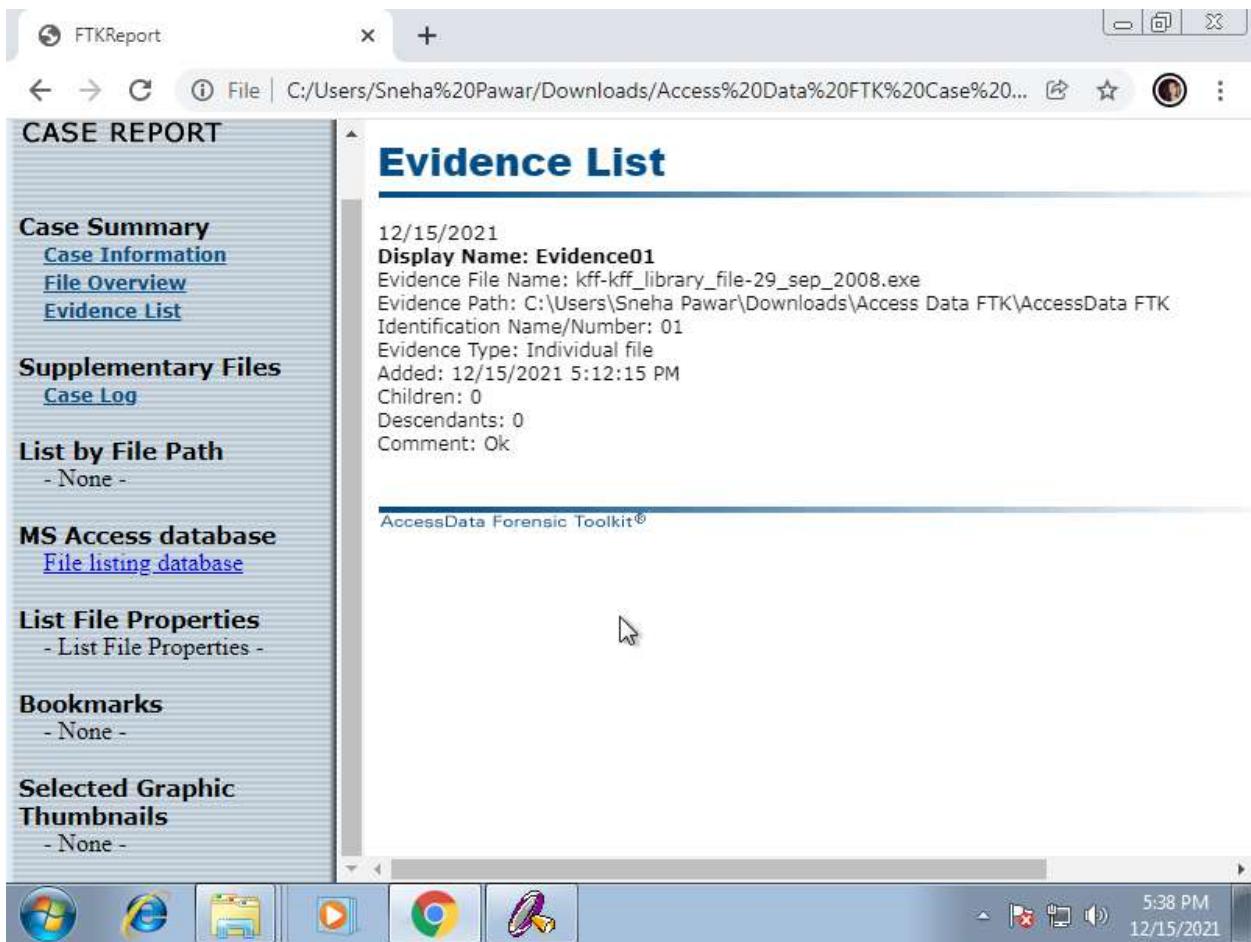
5:30 PM
12/15/2021

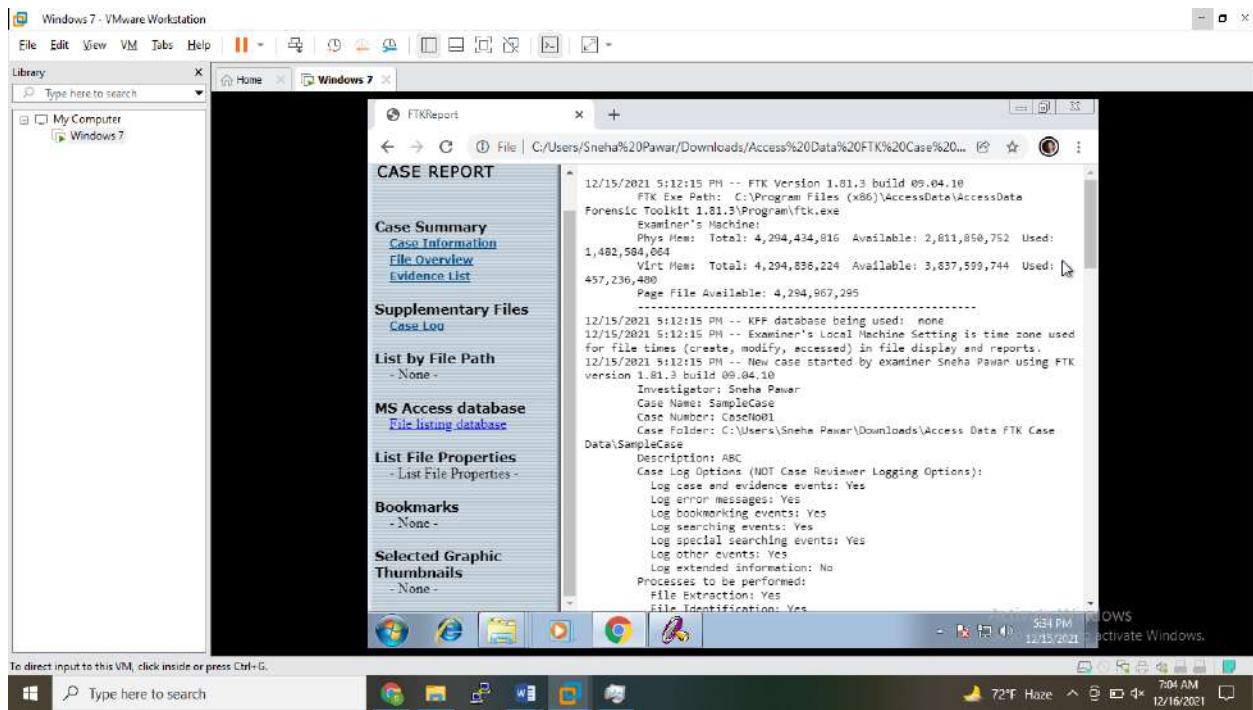


Enter report location.



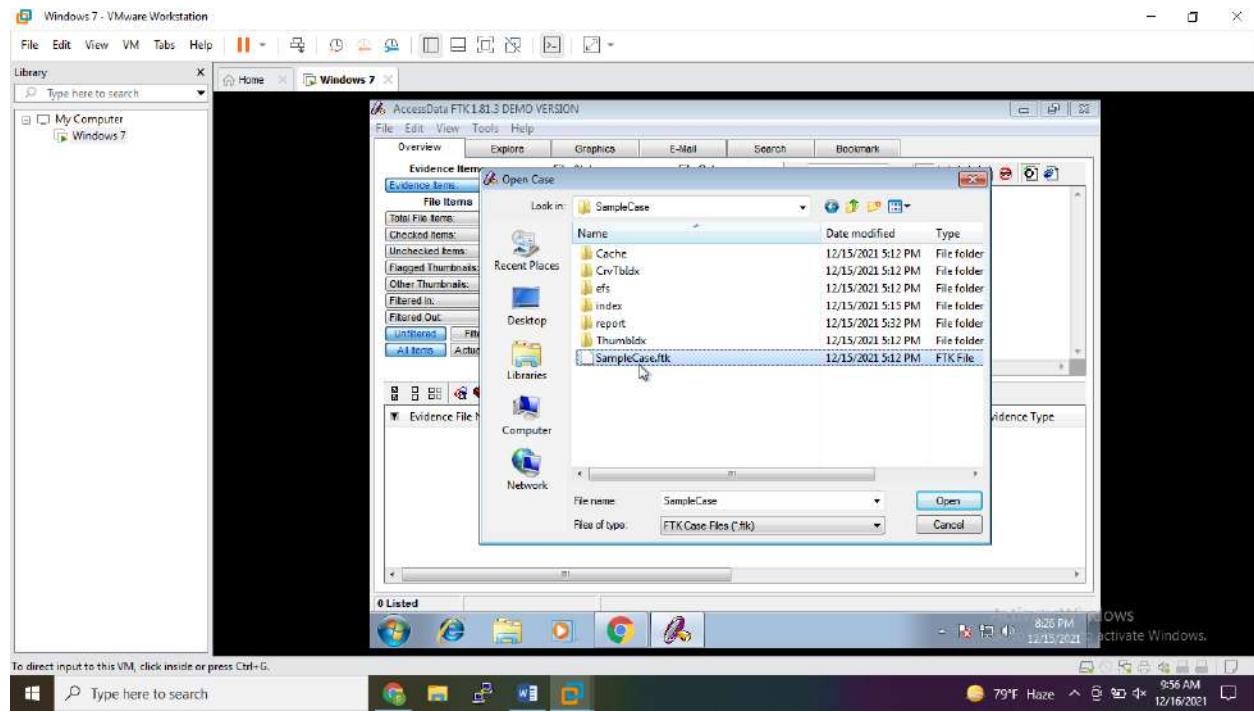






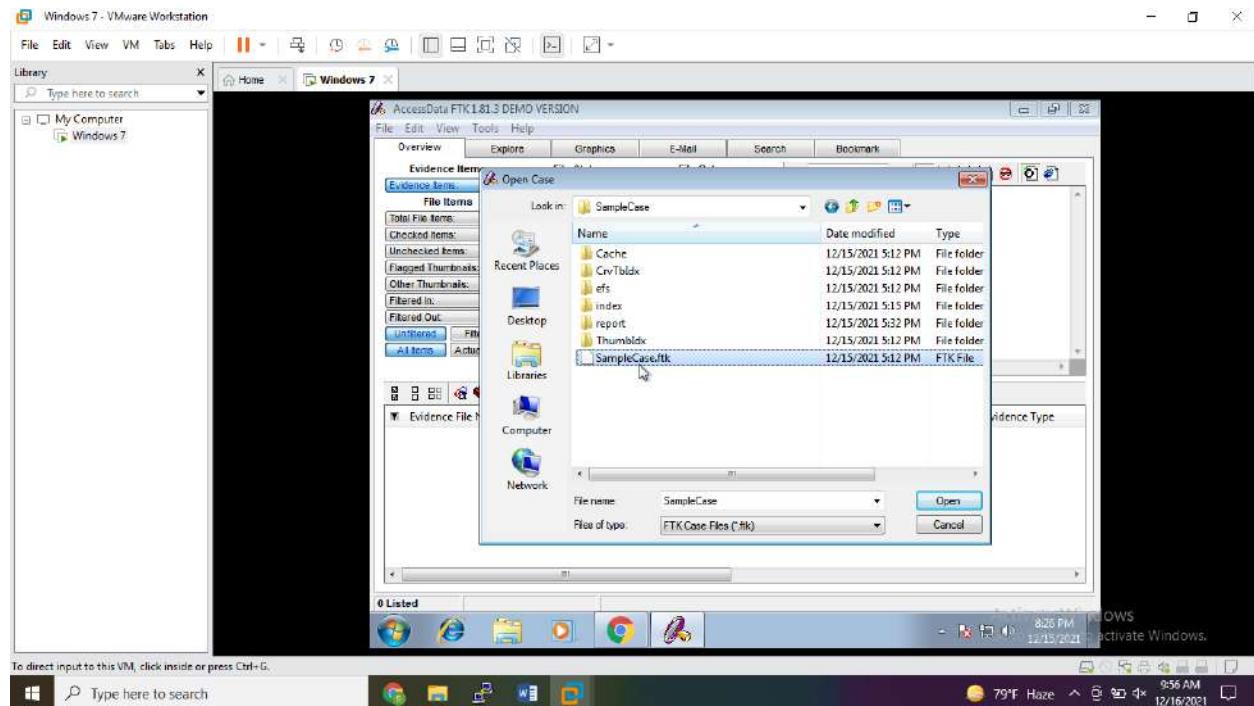
Now, let's perform Email Forensic on this. Open Existing Case that we have created.

File – Open Case

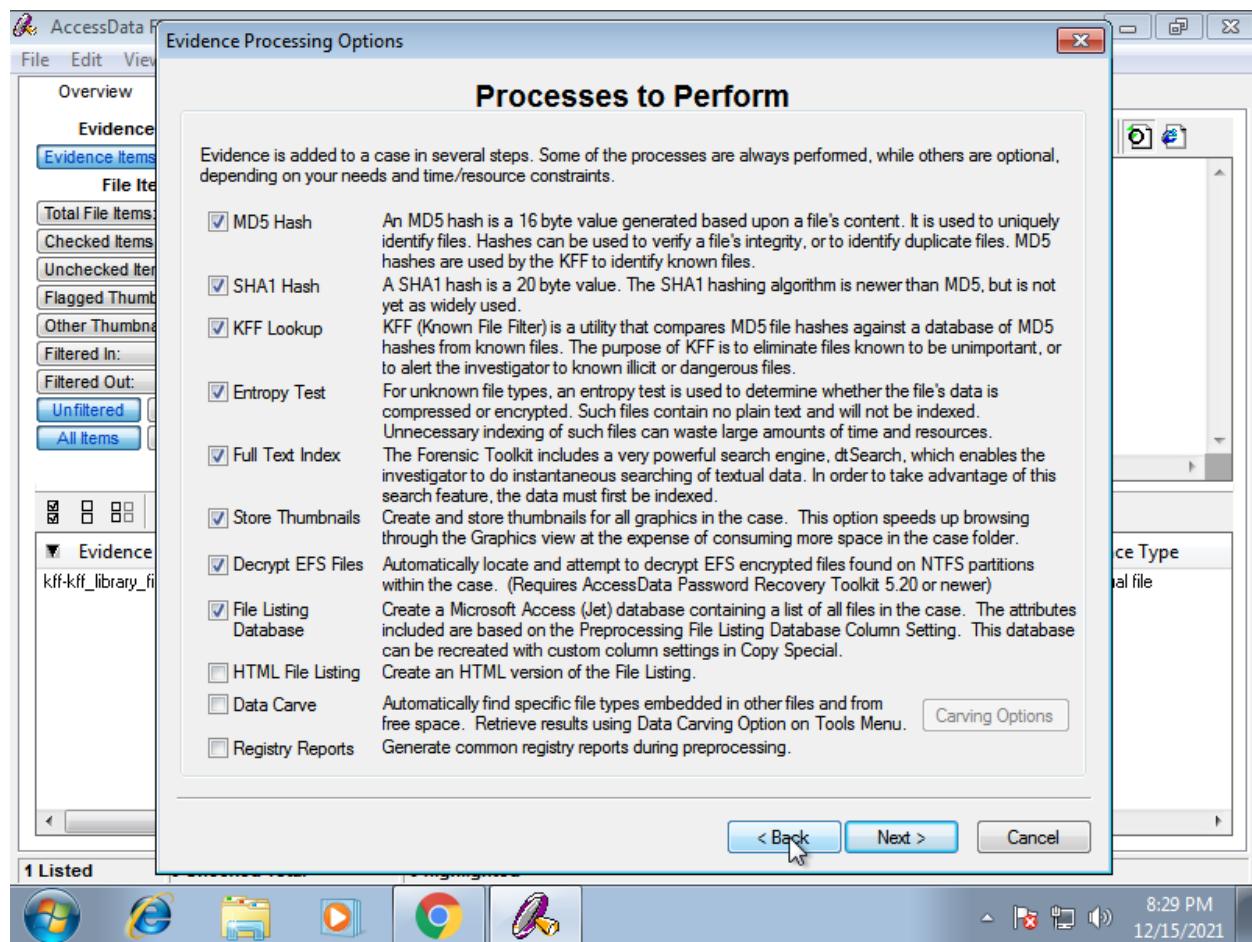
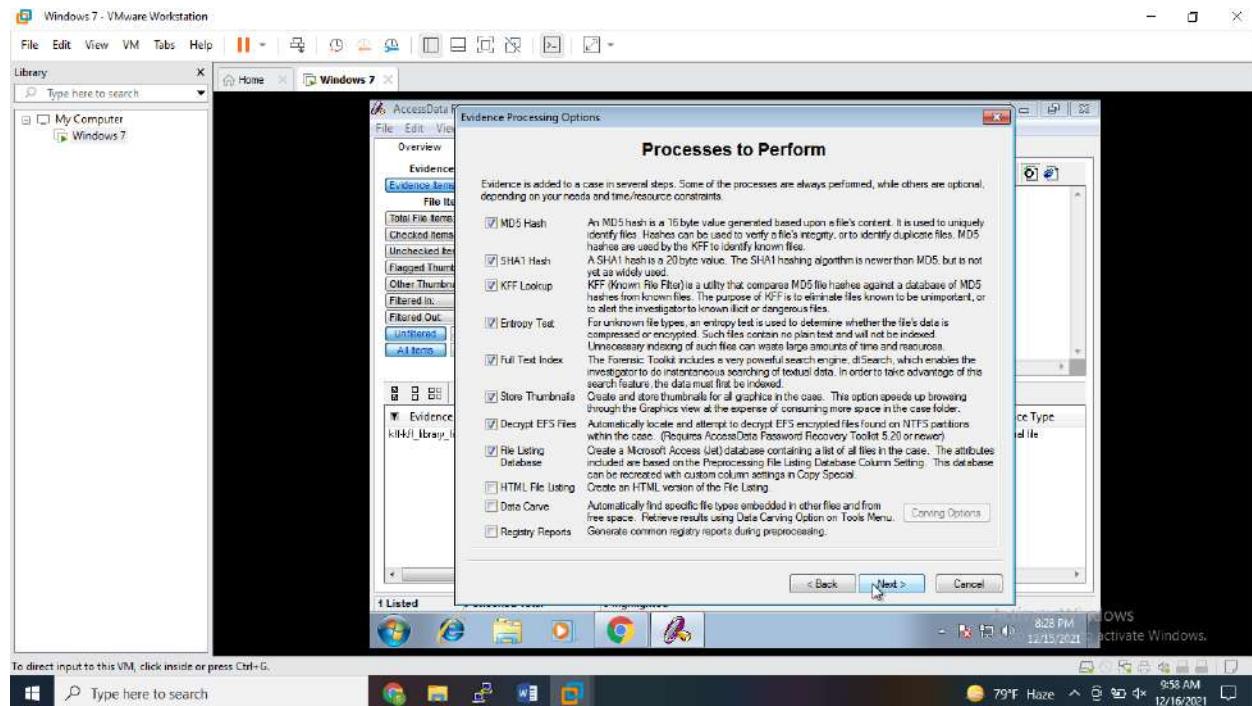


Now File – Add Evidence, and add Outlook’s pst file.

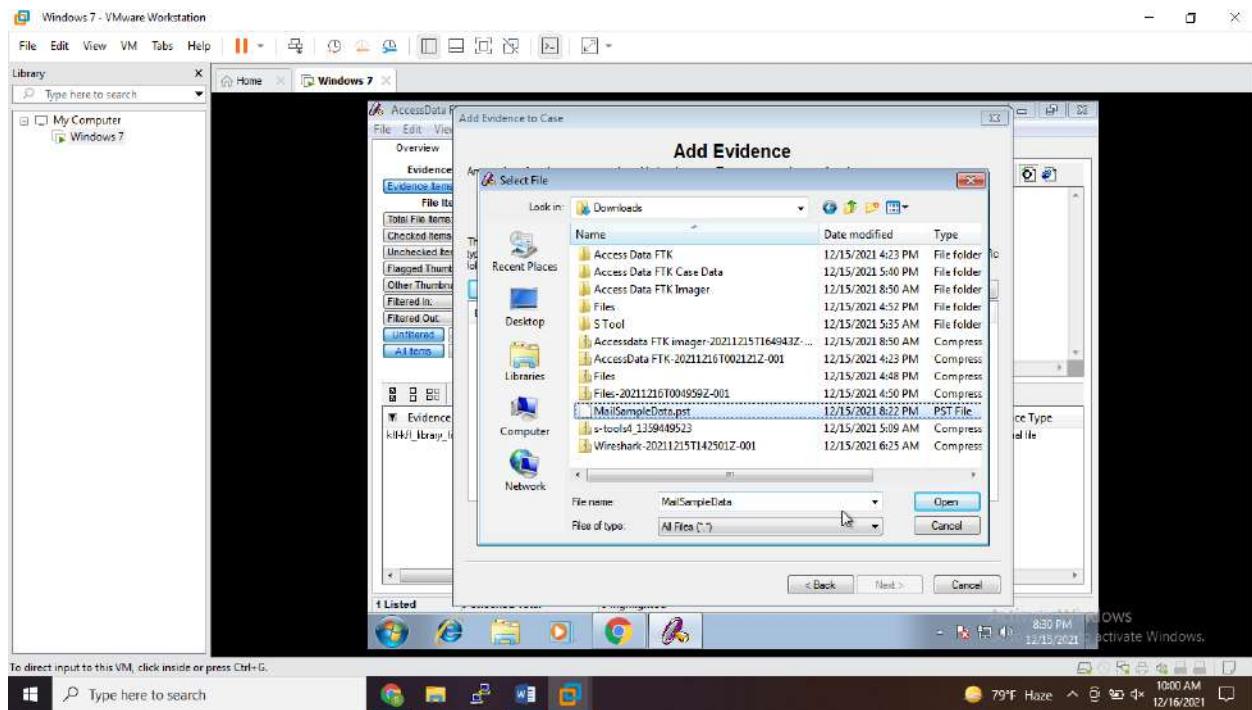
Keep this by default.



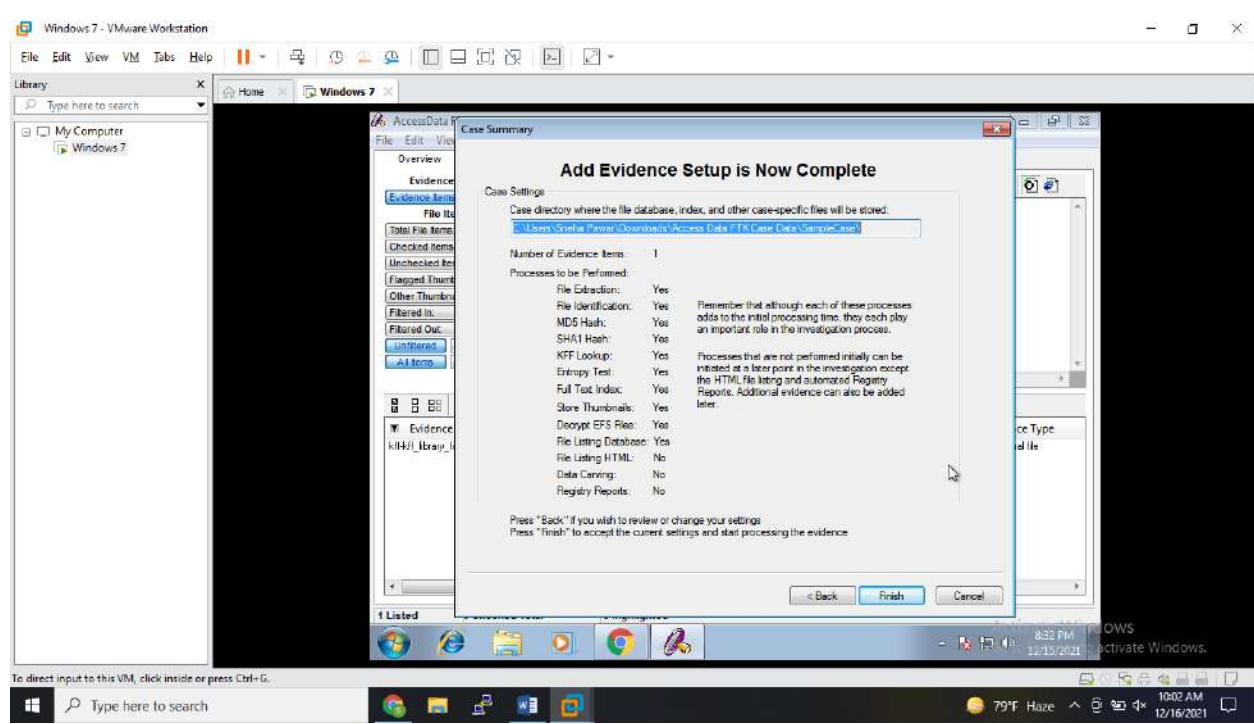
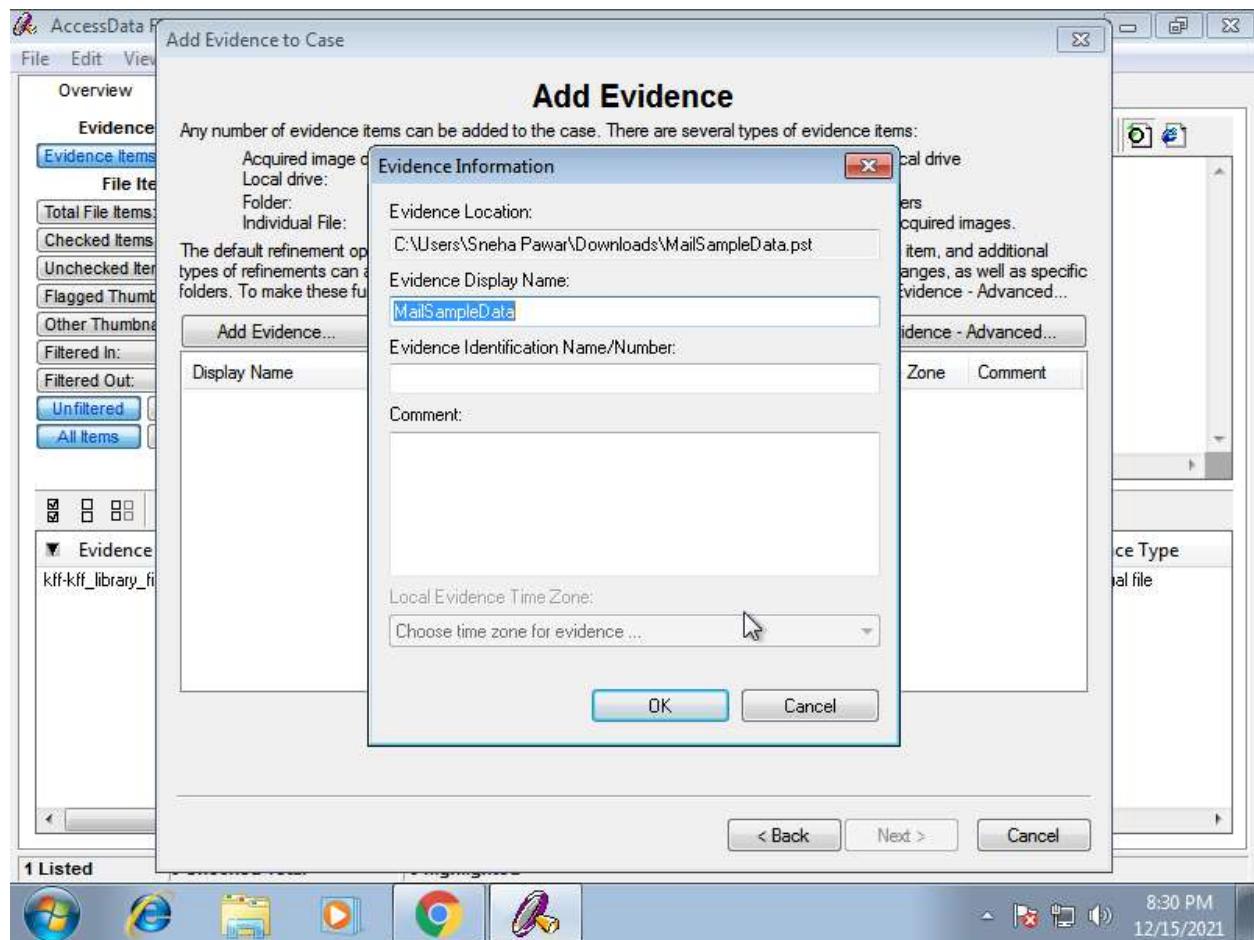
Click Next



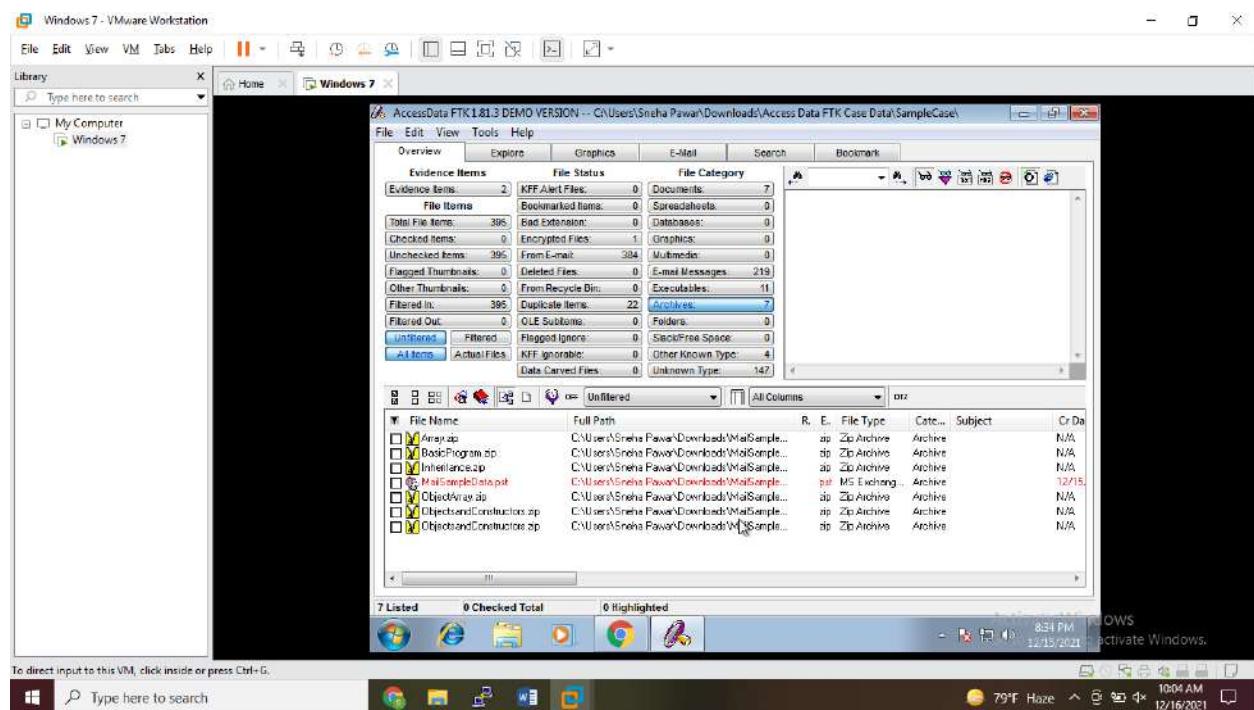
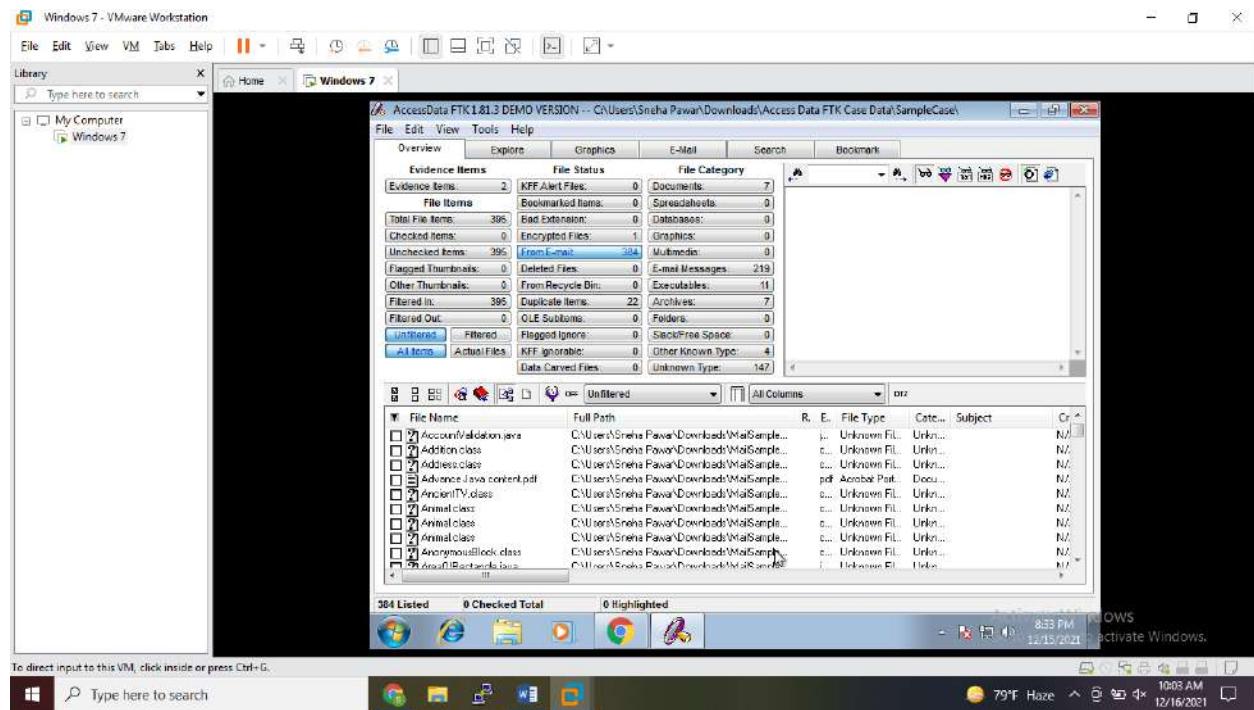
Then Add Evidence – Individual File – Browse location of a pst file.

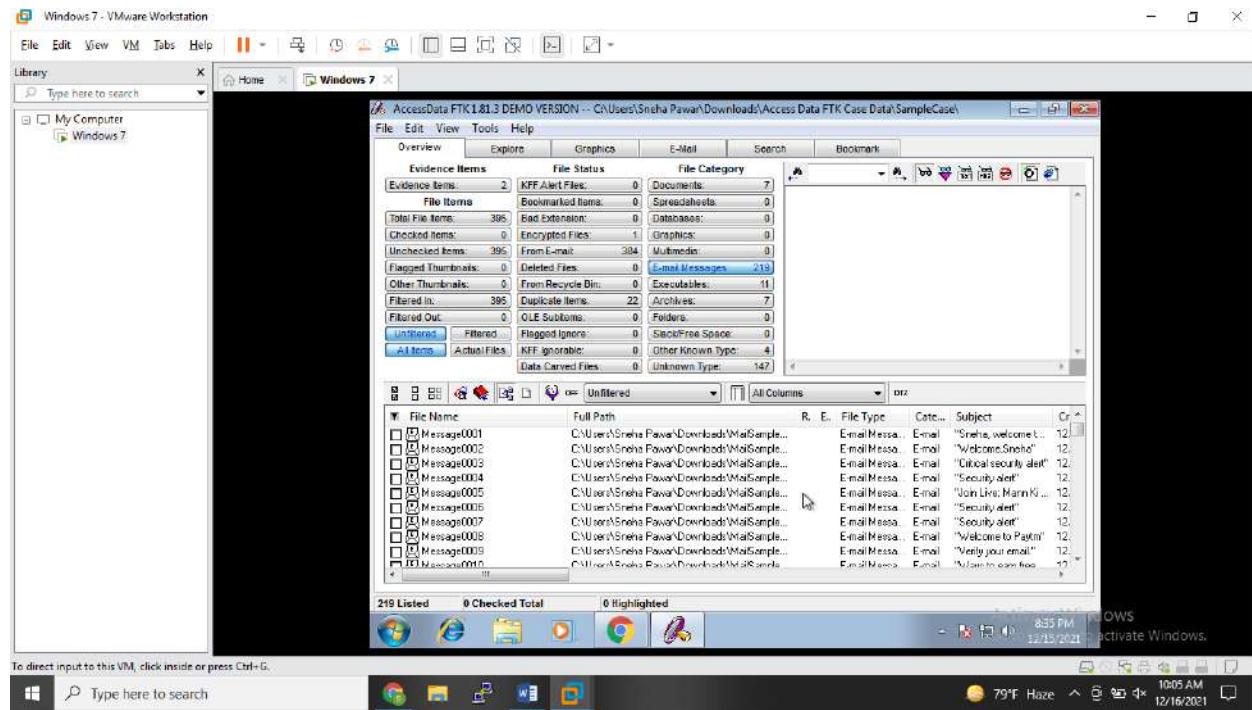


Click on Ok. And then click on Next.

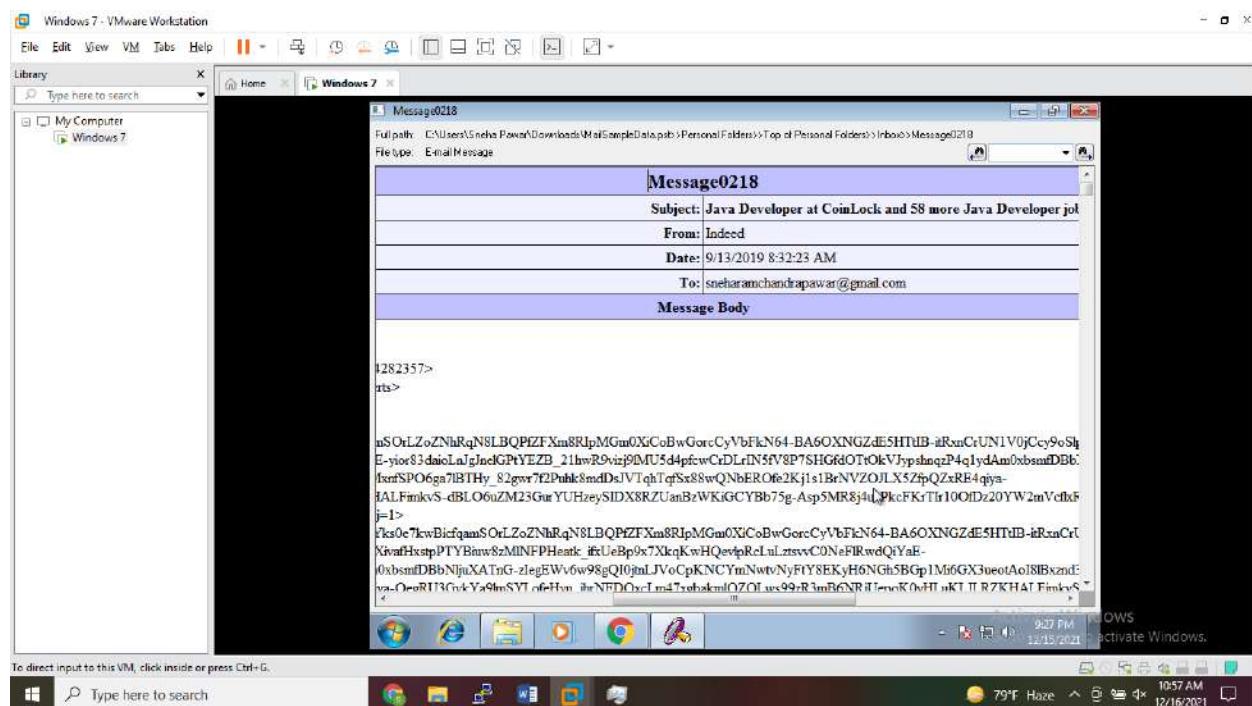


Emails will get acquired as you can see after double clicking on an evidence.



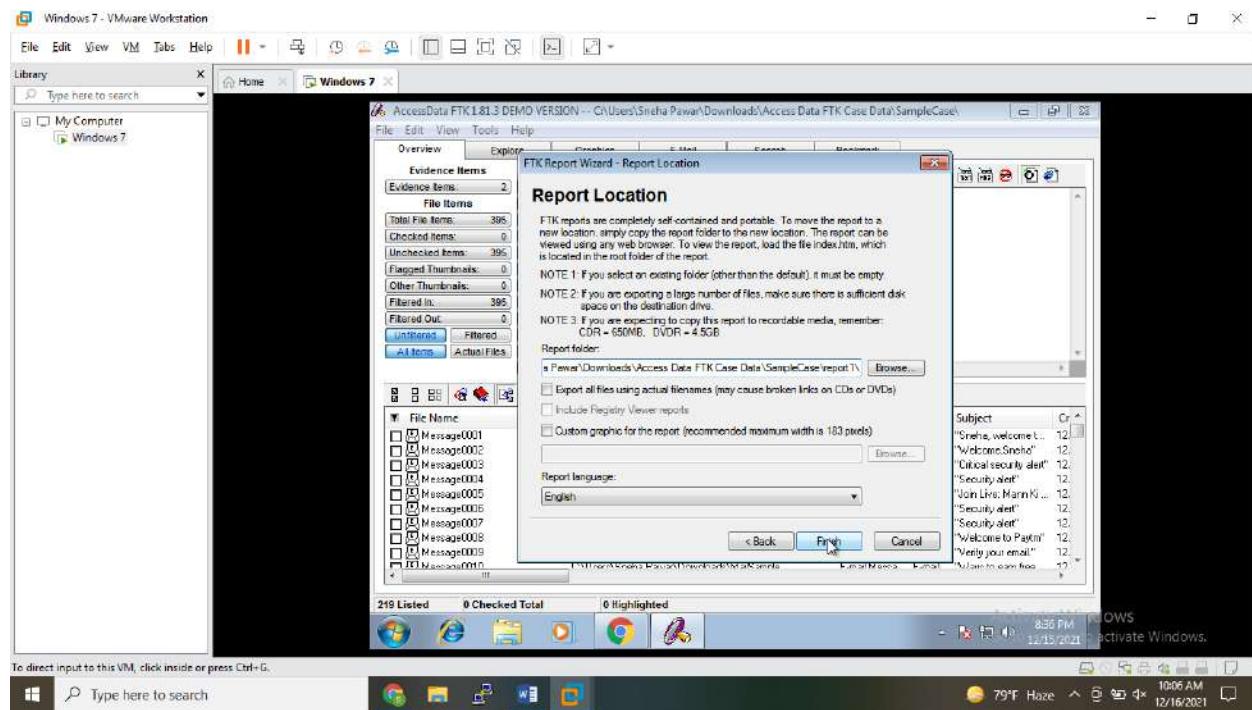
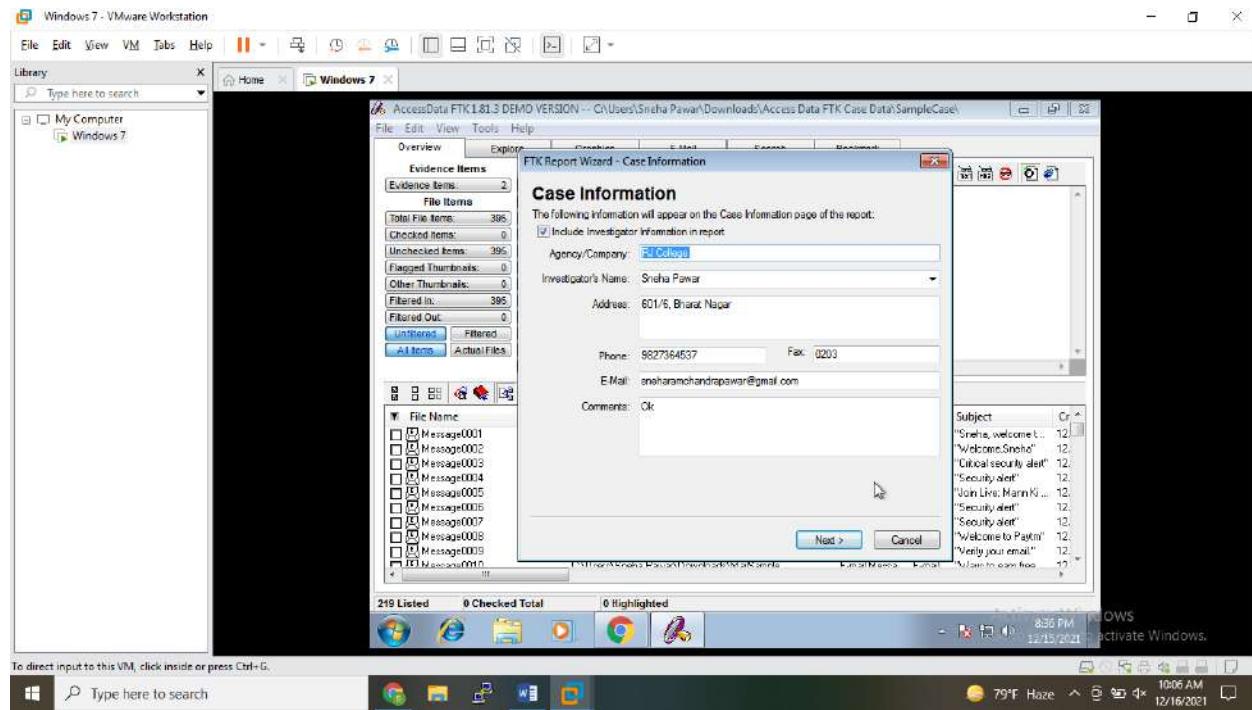


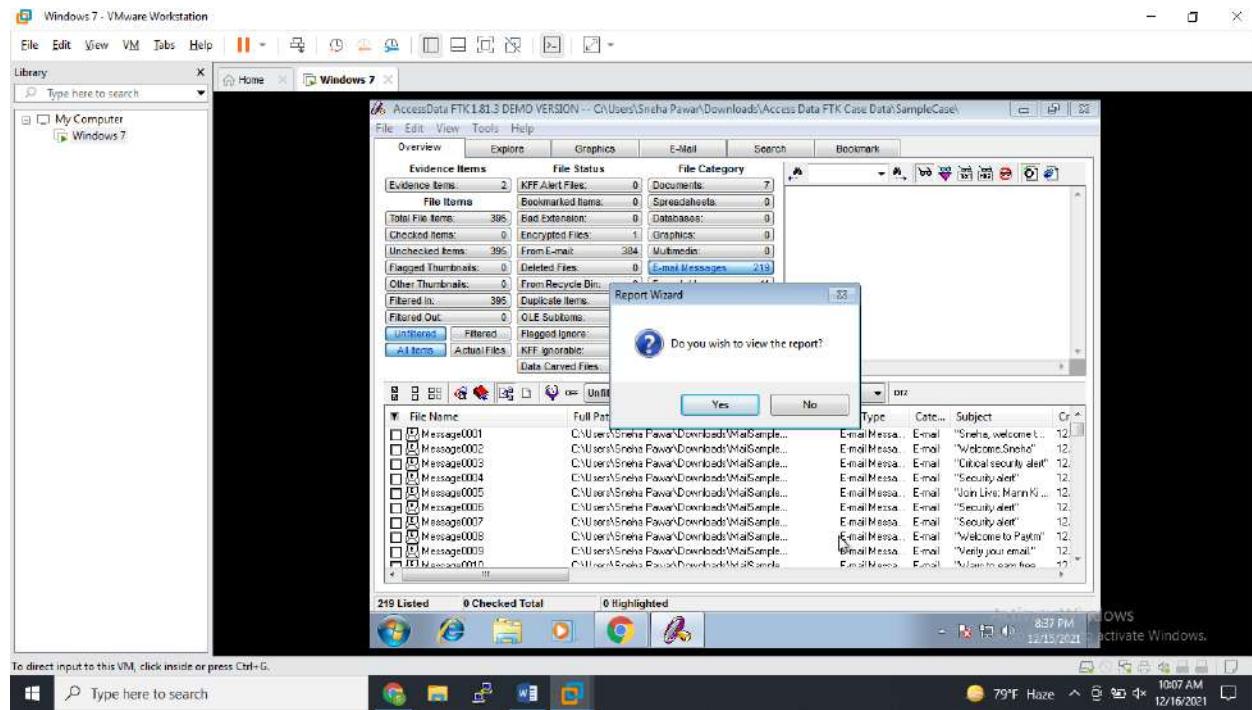
Right click on Mail to see it in Detached view.



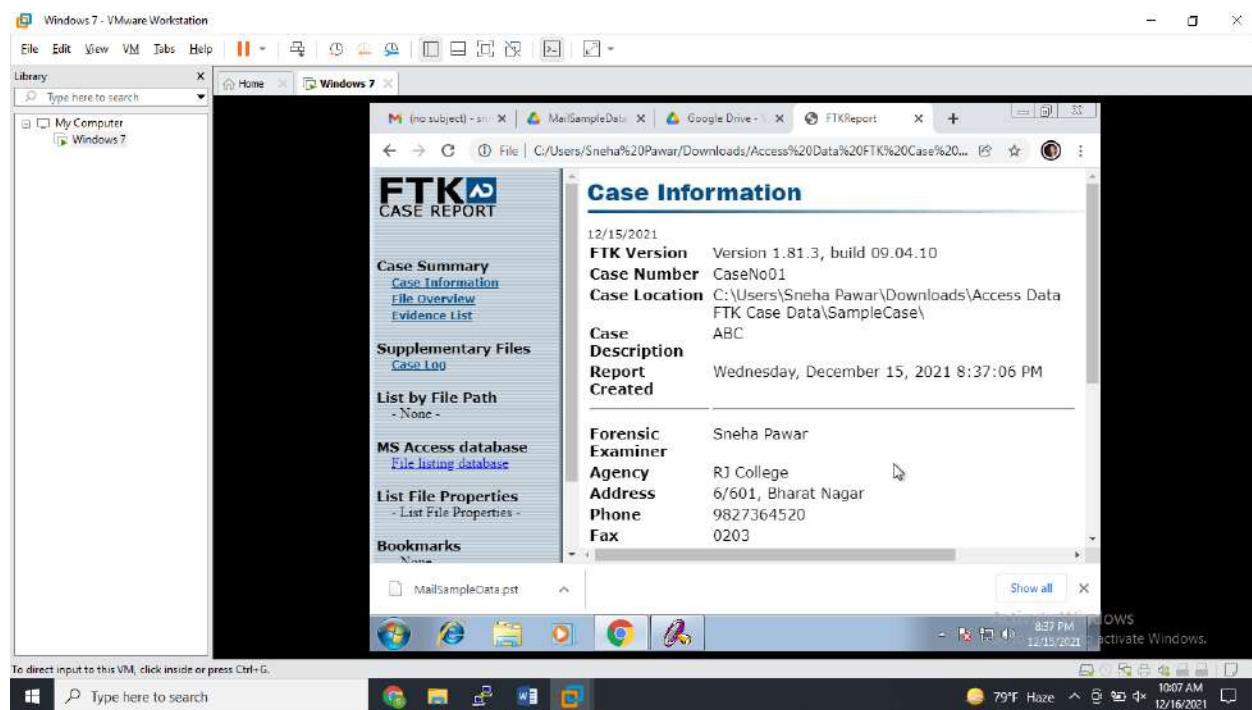
Steps:

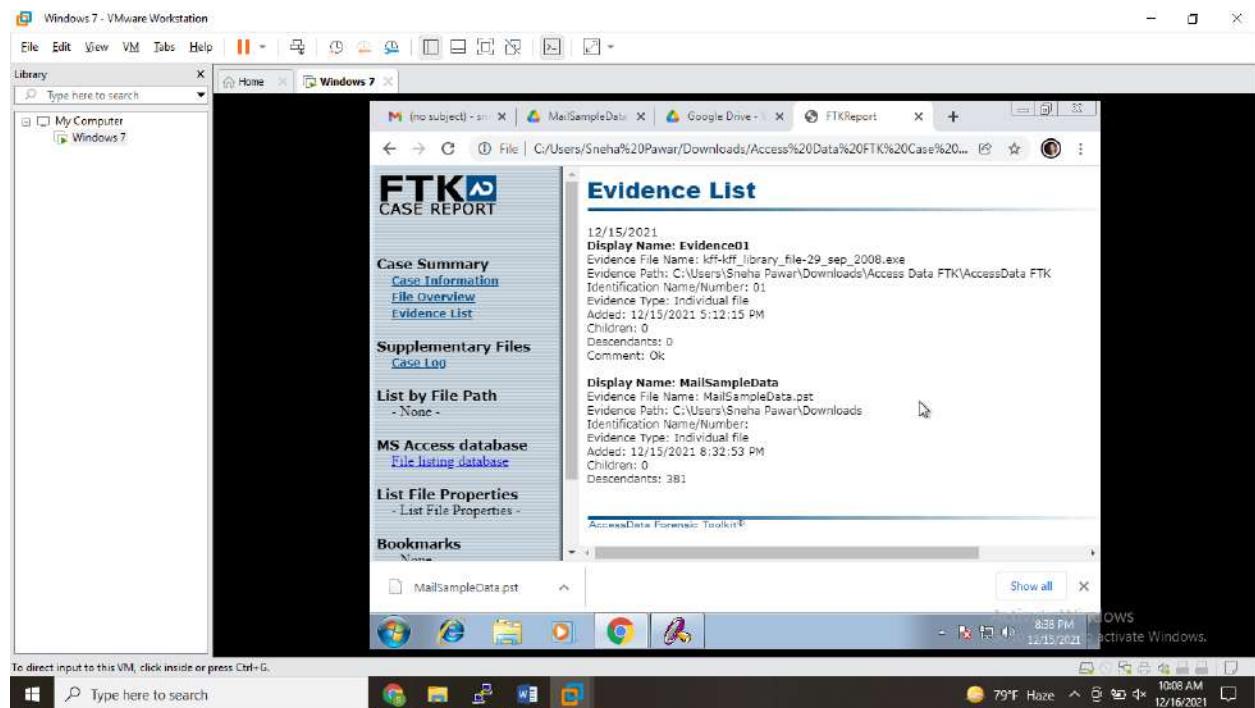
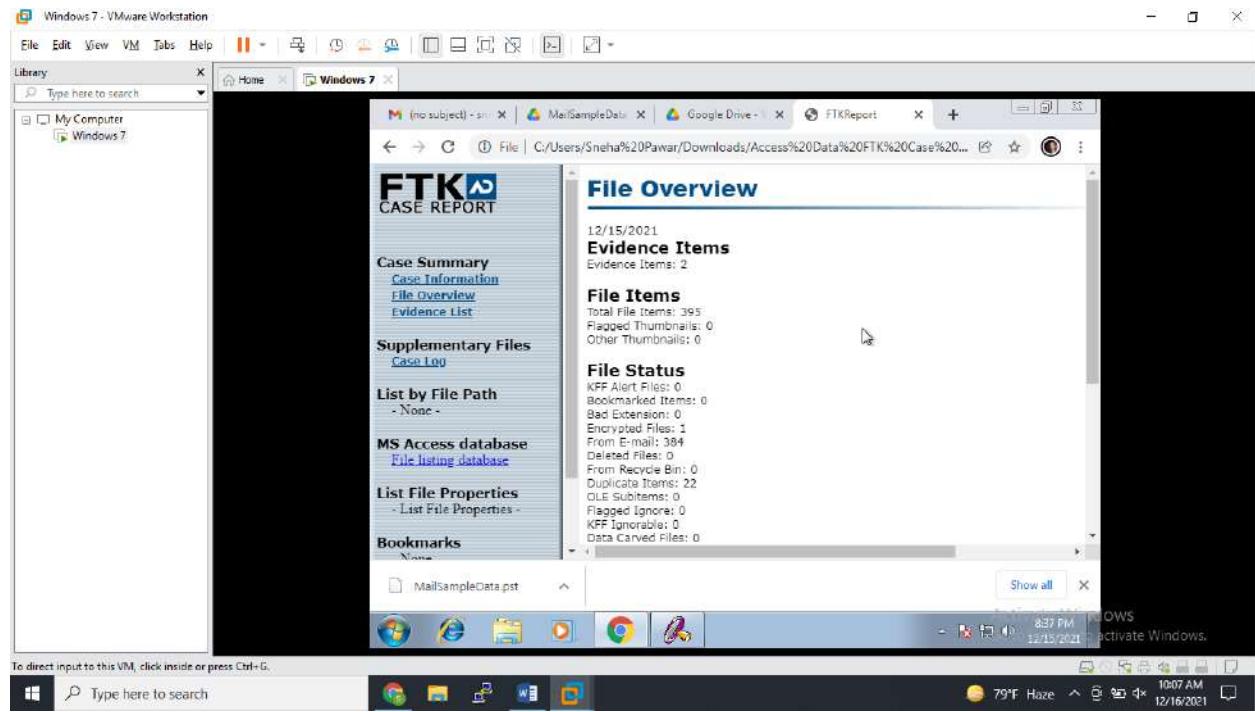
Now click on Report Wizard. And keep options by default and click on Next.





Click on Yes.





Practical No. 03

Aim: Using Data Acquisition Tools [ProDiscover Pro]

What is Data Acquisition?

Forensic Data Acquisition. Data acquisition is the **process of making a forensic image** from computer media such as a hard drive, thumb drive, CDROM, removable hard drives, thumb drives, servers and other media that stores electronic data including gaming consoles and other devices.

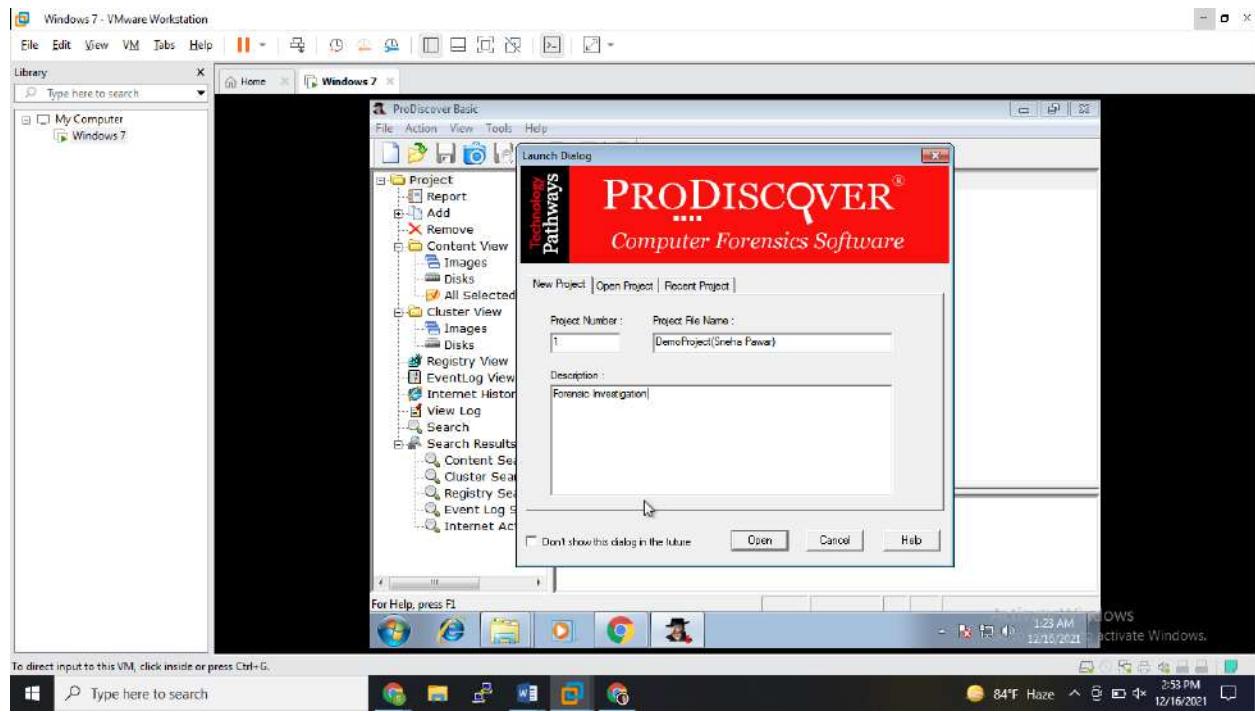
ProDiscover Tool:

ProDiscover Forensics is a comprehensive digital forensics software that empowers investigators to capture key evidence from computer systems. ProDiscover has capabilities to handle all aspects of an in-depth forensic investigation to collect, preserve, filter, and analyze evidence.

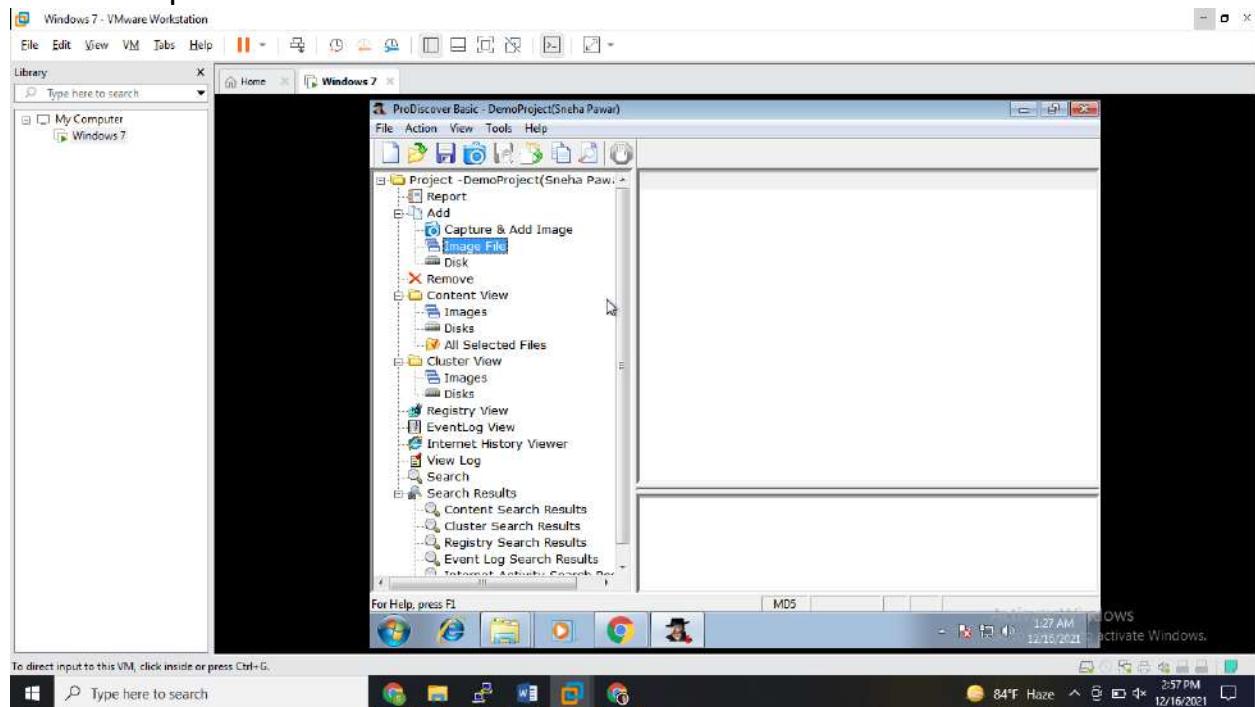
An investigator can use the tools and features of ProDiscover to identify discrete bits of evidence and connect those to form a cohesive picture. ProDiscover provides capabilities to analyze the nature and the modalities of the cybercrime. Evidentiary quality reports can be prepared and presented in the court of law.

Steps:

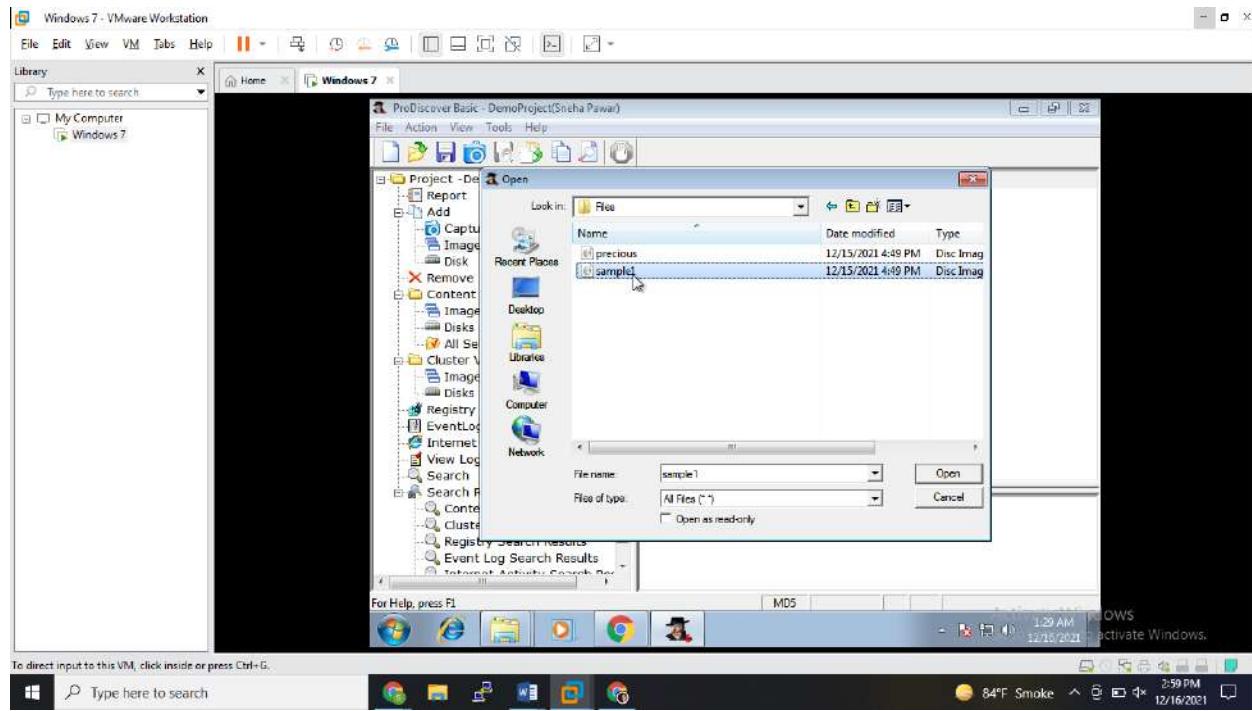
First download the ProDiscover and install it in pc and open. Enter Project Number, Project File Name, and description in ProDiscover Basic software. Click on Open.



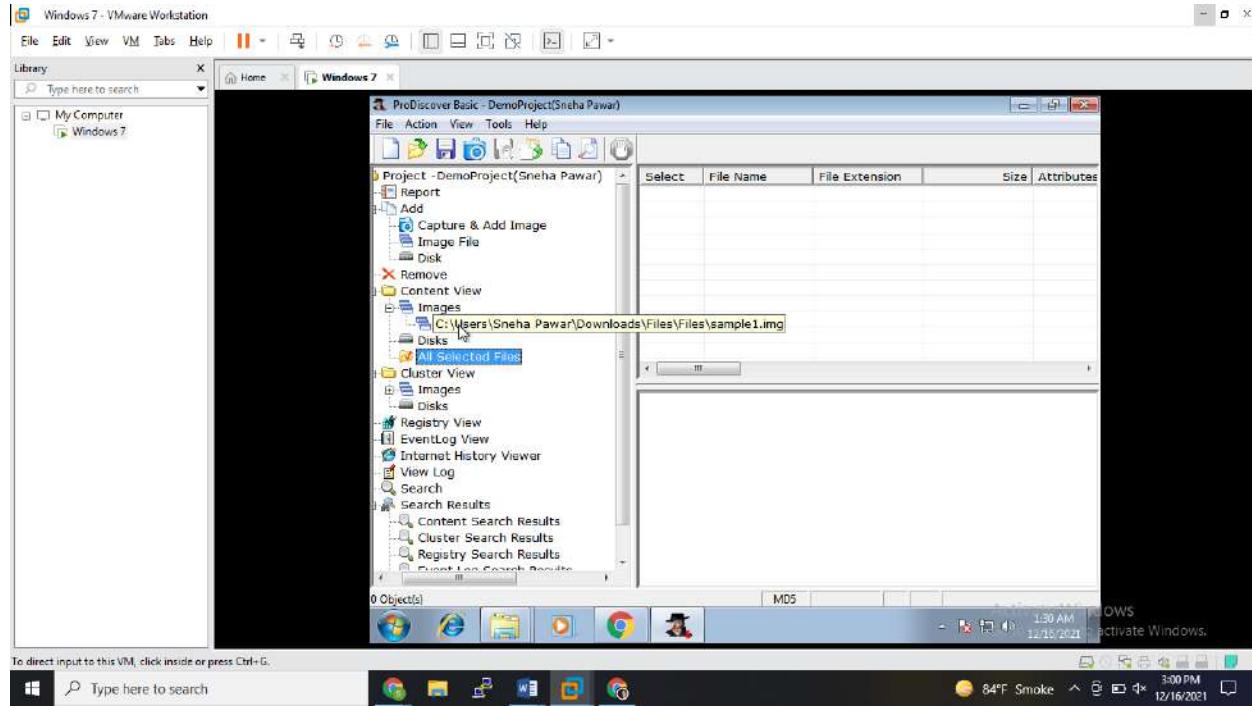
Click on Image File & browse for sample1 file. Sample1 is a sample disk file, as we are not using any USB drive or physical drive. So we will use the sample1 file.

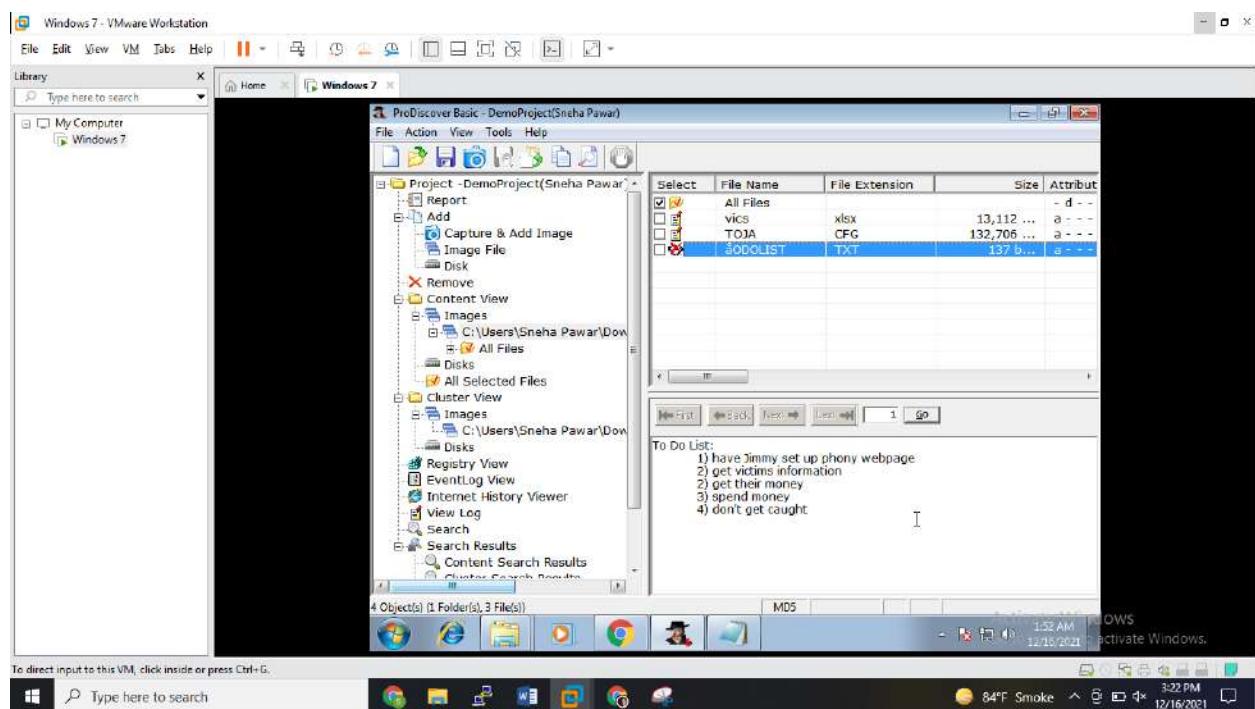
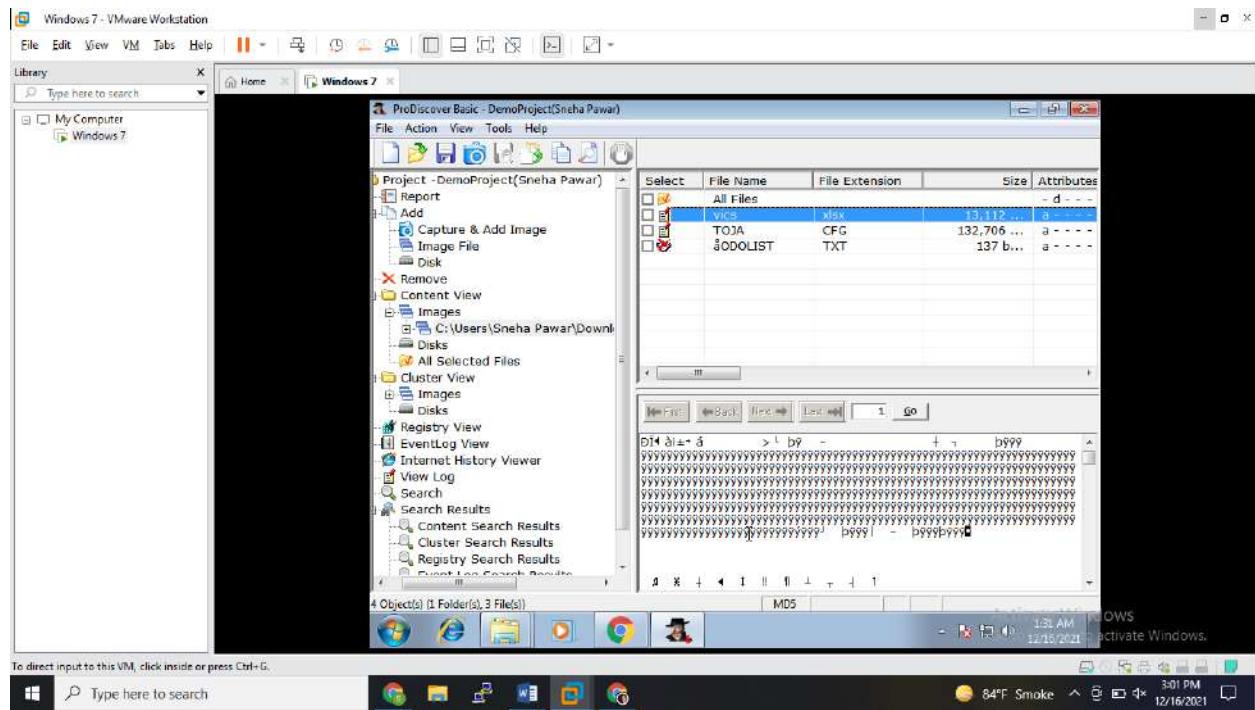


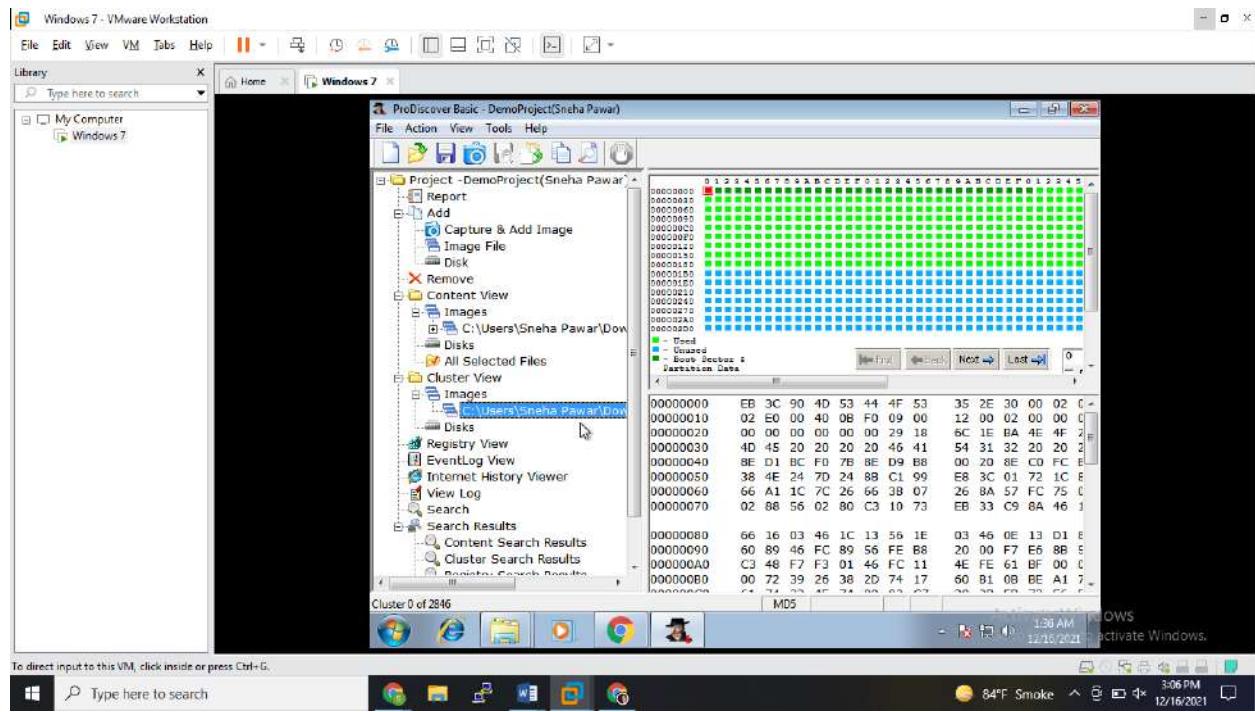
Click on Open.



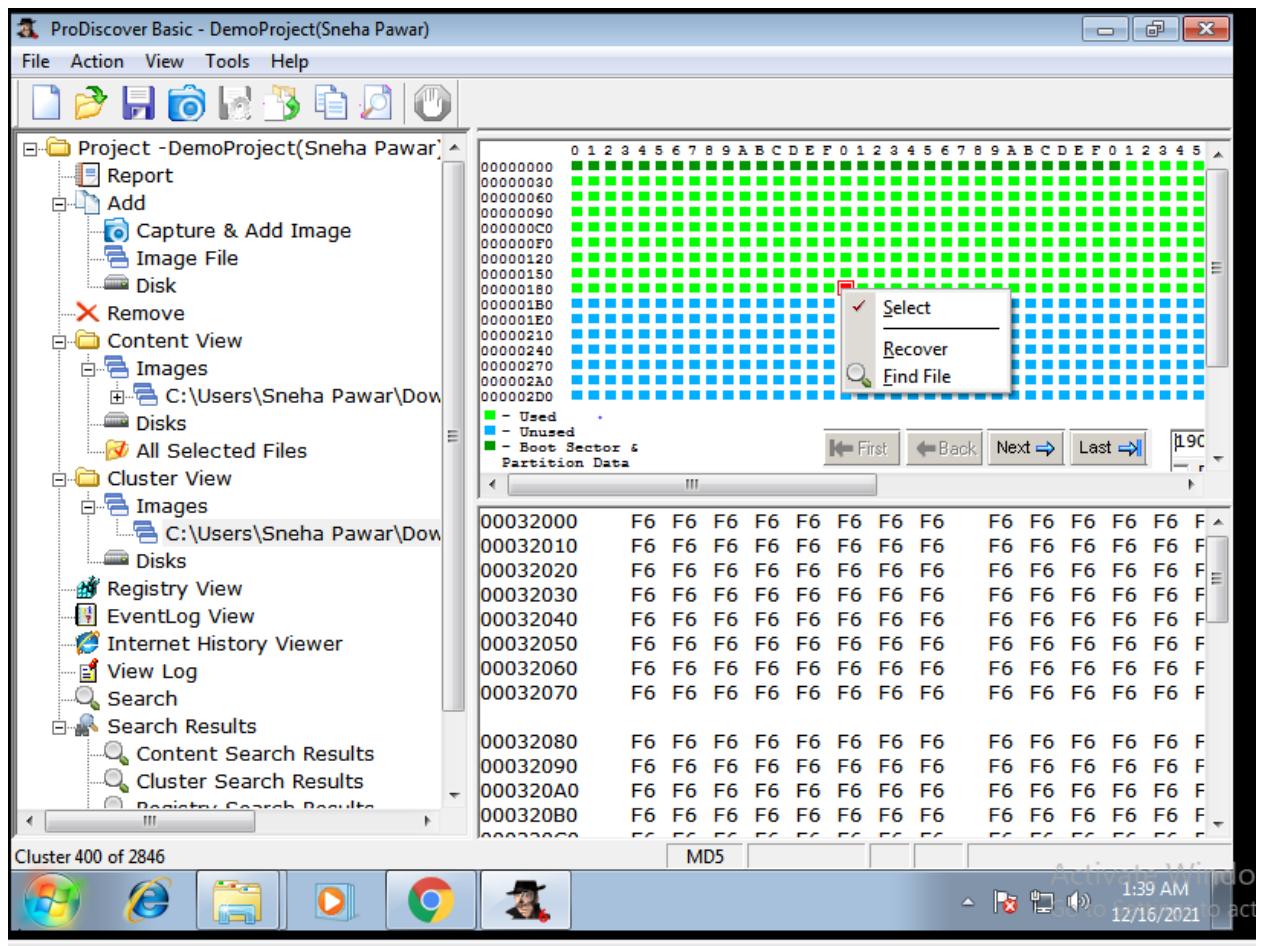
Now the project will open & go to the left menu and click on Content view. Then it will show you all the contents of evidence image file.



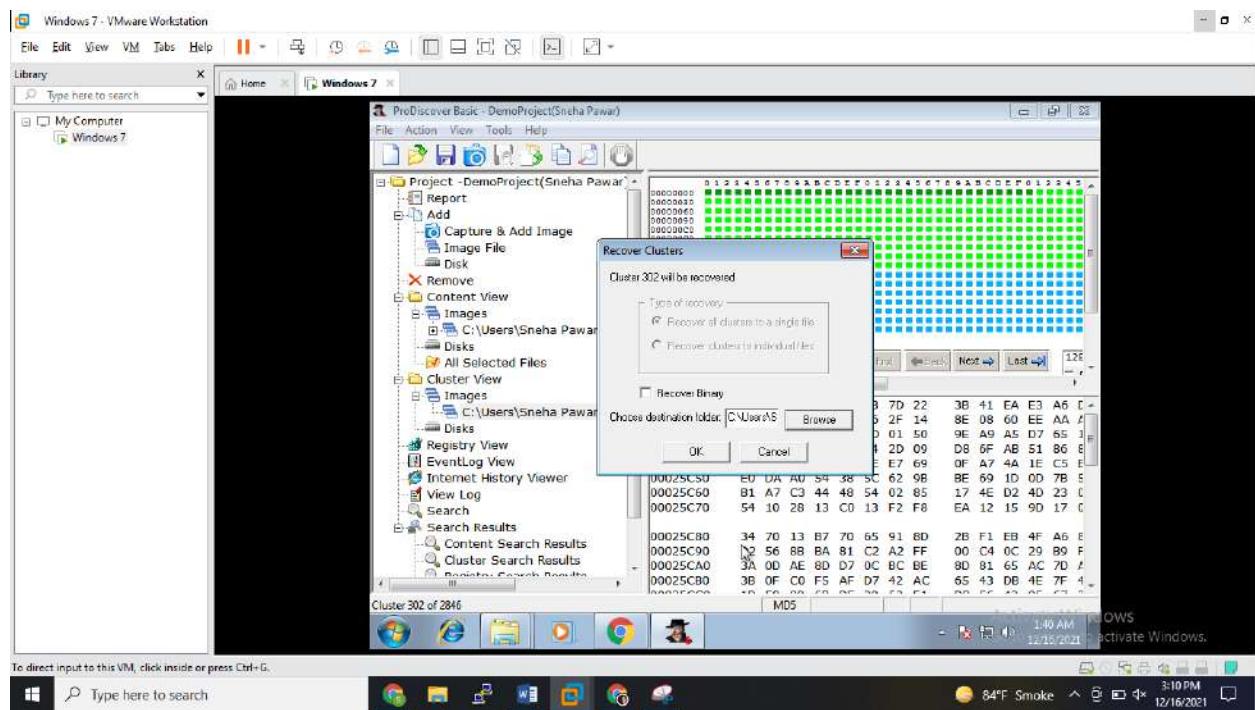
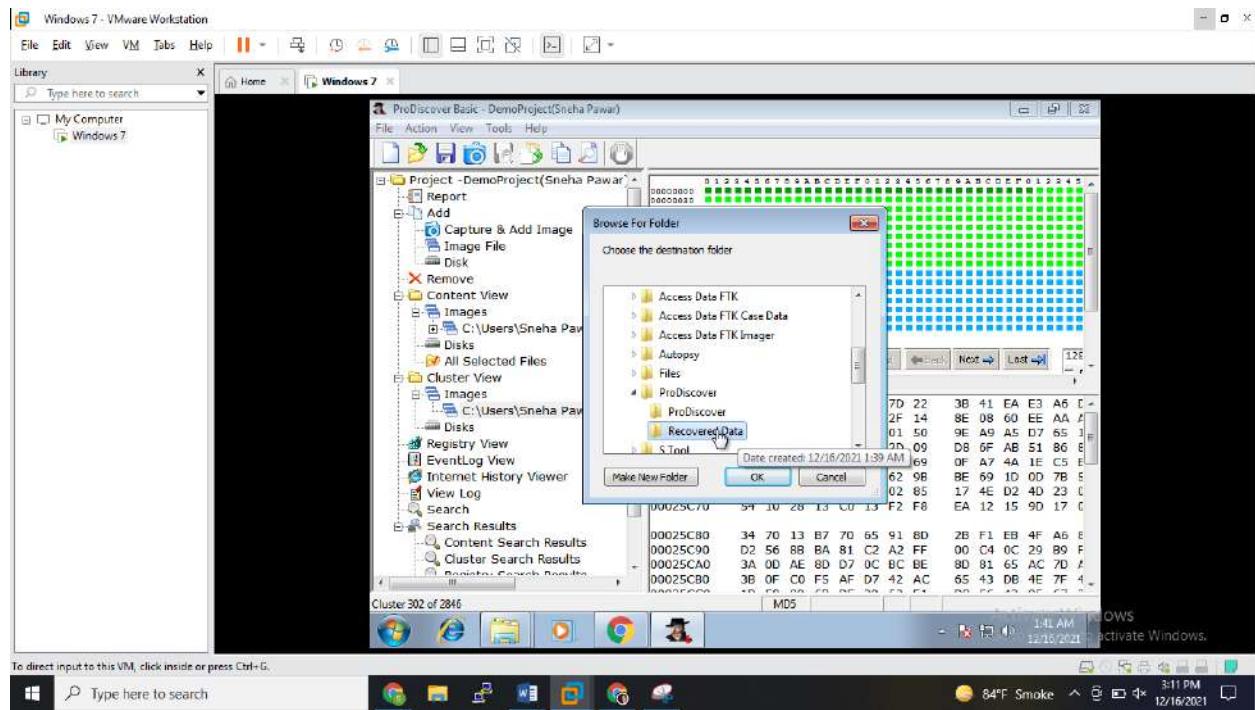


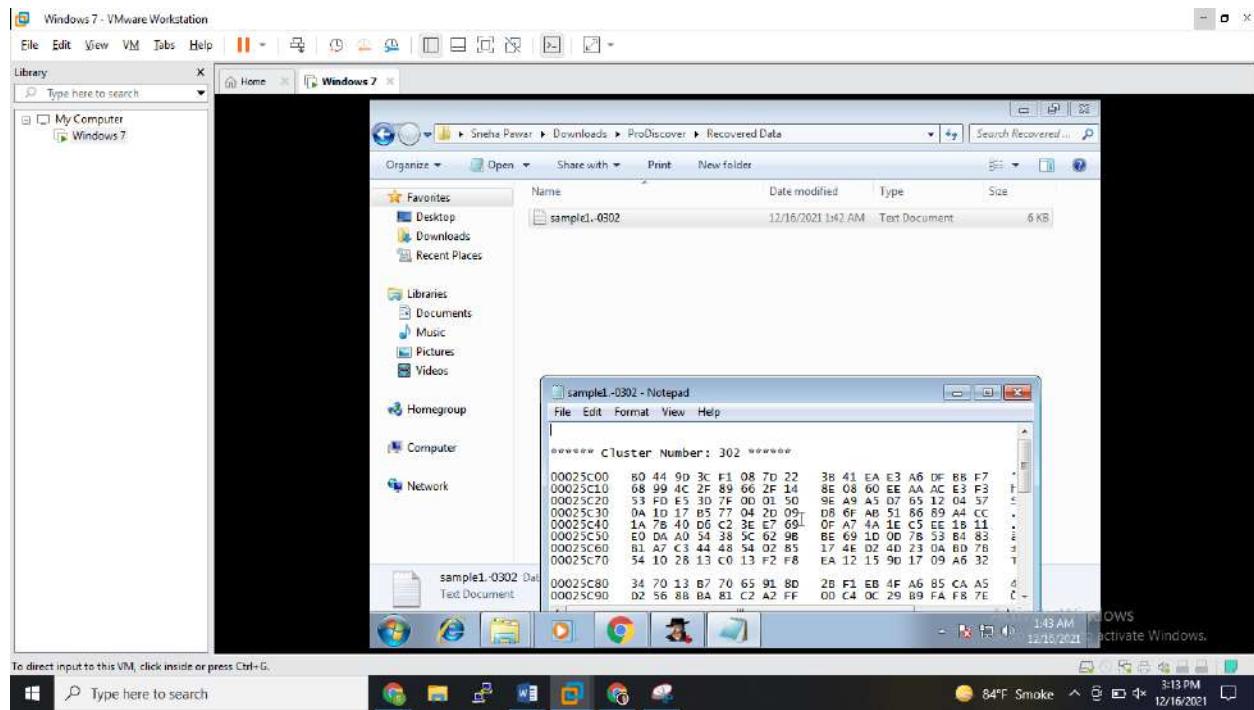


Right click on it and click on recover.

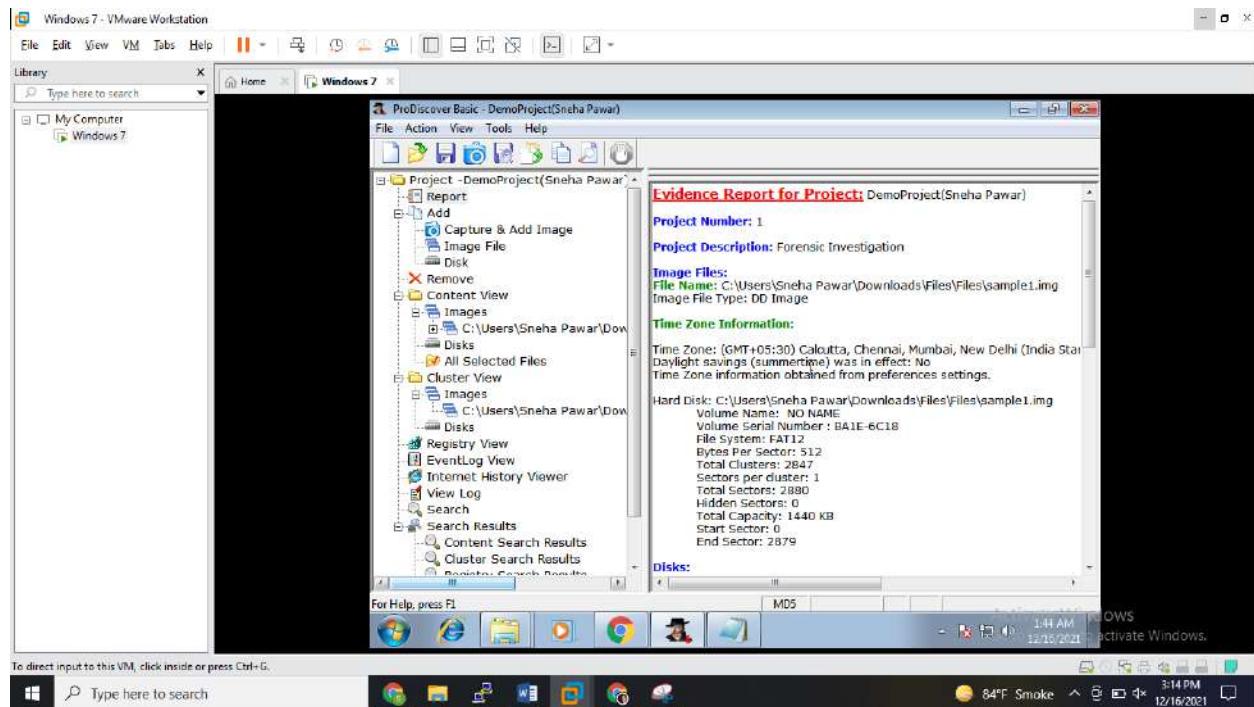


Browse for the path where you want to recover the data.





You can also see the generated report. To generate the automatic report click on report tab under the view menu. Then it will show you Evidence Report.



Practical No. 04

Aim: Creating Image using File Recovery Tools[FTK Imager].

What is File Recover?

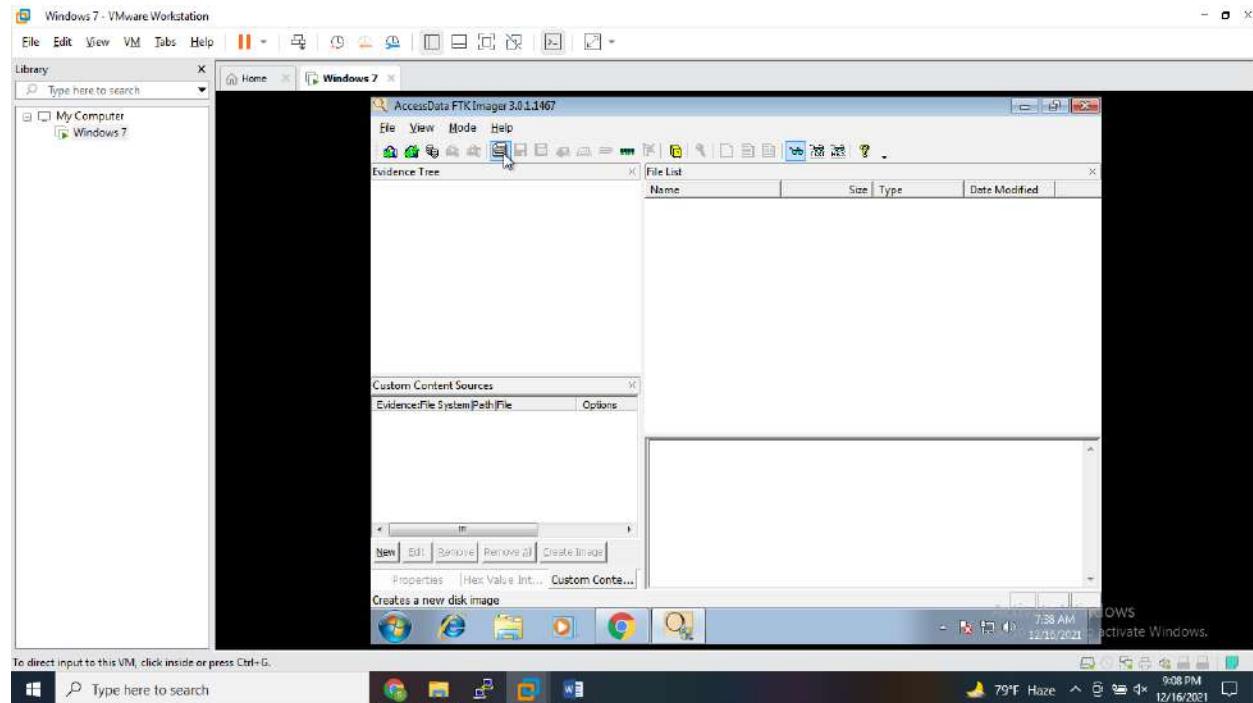
In [computing](#), **data recovery** is a process of salvaging inaccessible, lost, corrupted, damaged or formatted data from [secondary storage](#), [removable media](#) or [files](#), when the data stored in them cannot be accessed in a usual way. The data is most often salvaged from storage media such as internal or external [hard disk drives](#) (HDDs), [solid-state drives](#) (SSDs), [USB flash drives](#), [magnetic tapes](#), [CDs](#), [DVDs](#), [RAID](#) subsystems, and other [electronic devices](#). Recovery may be required due to physical damage to the storage devices or logical damage to the [file system](#) that prevents it from being [mounted](#) by the host [operating system](#) (OS).

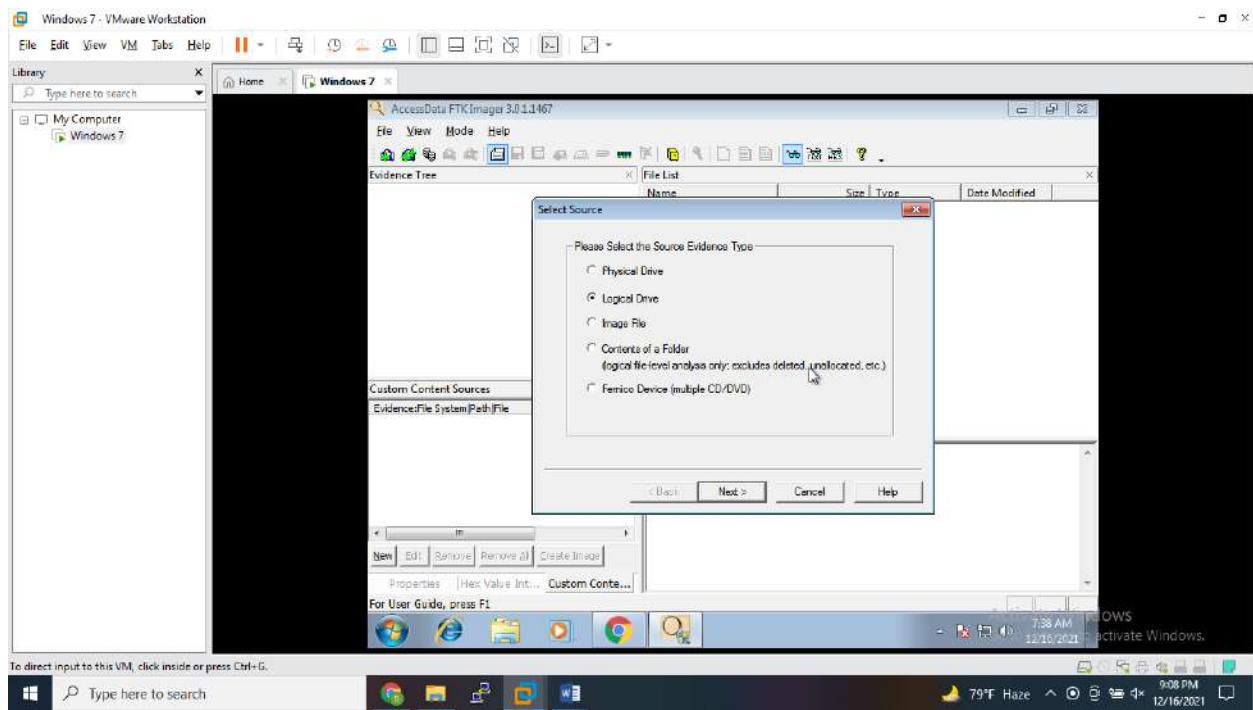
What is FTK Imager?

FTK® Imager is a **data preview and imaging tool used to acquire data (evidence) in a forensically sound manner** by creating copies of data without making changes to the original evidence. ... Export files and folders from forensic images.

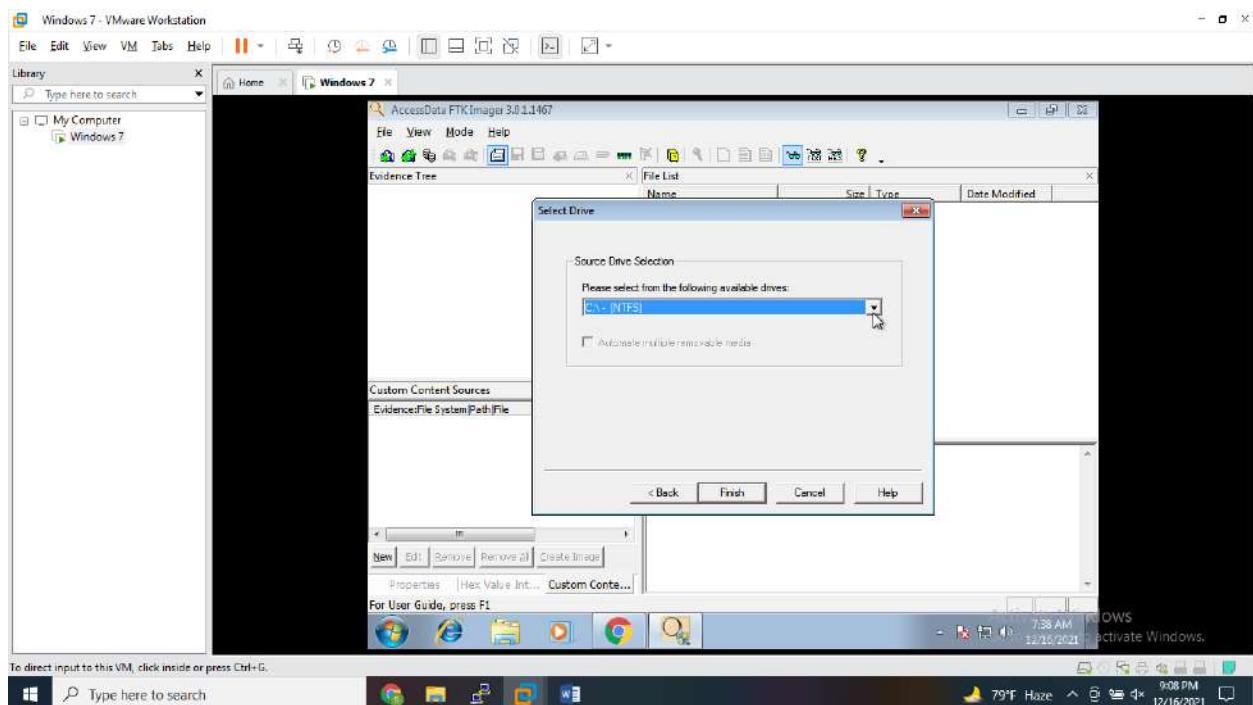
Steps:

Open Access FTK Imager. Click on create Disk image of a logical drive. Select create disk image.

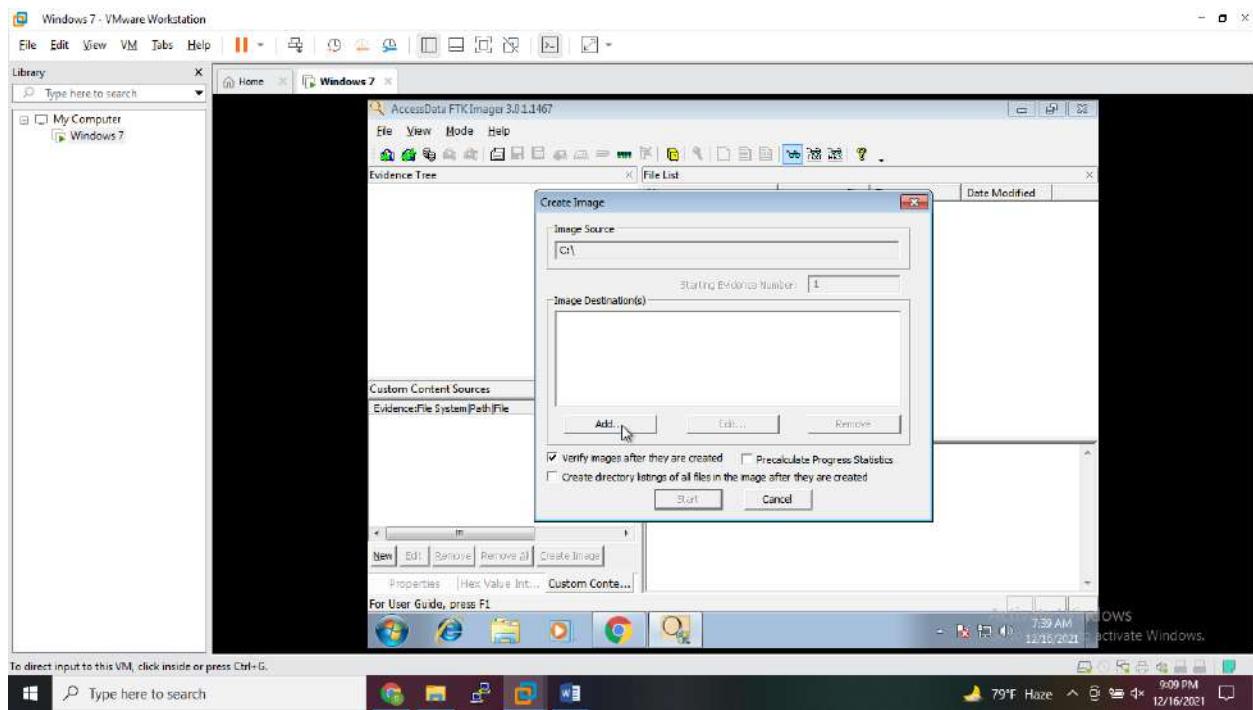




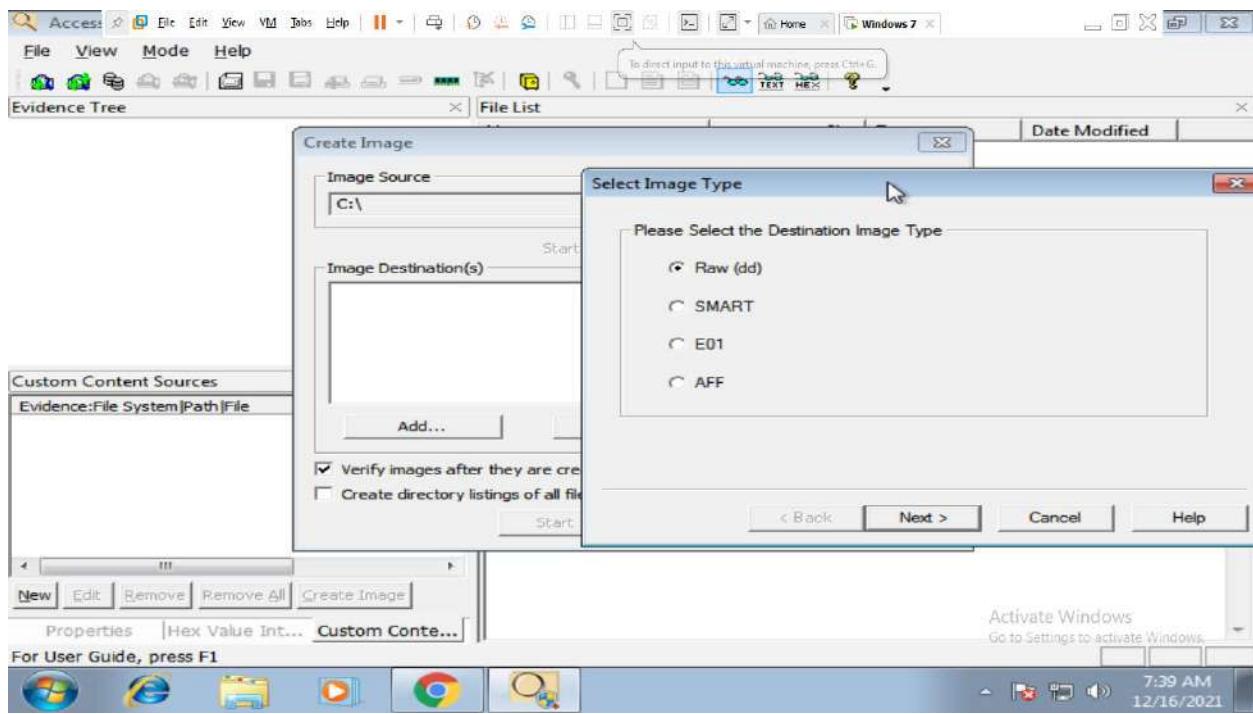
Select a Drive and click on Finish.



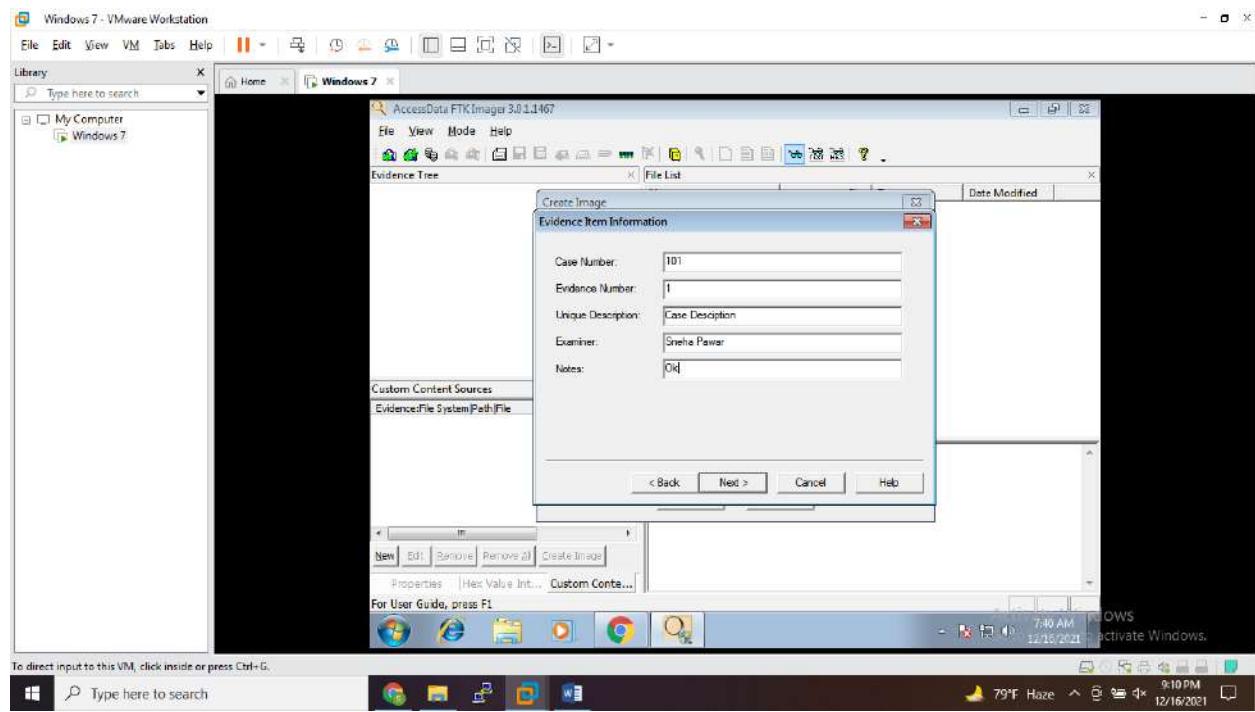
Click on ADD.



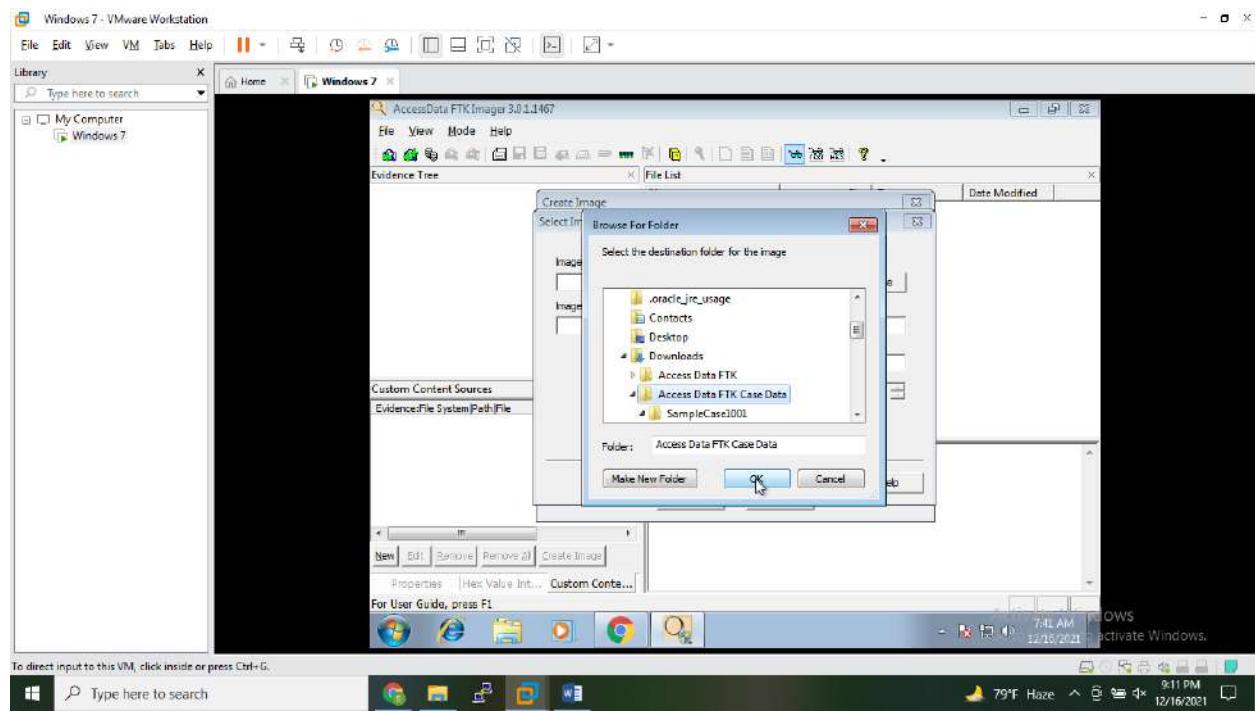
And select Image type as Raw(dd).

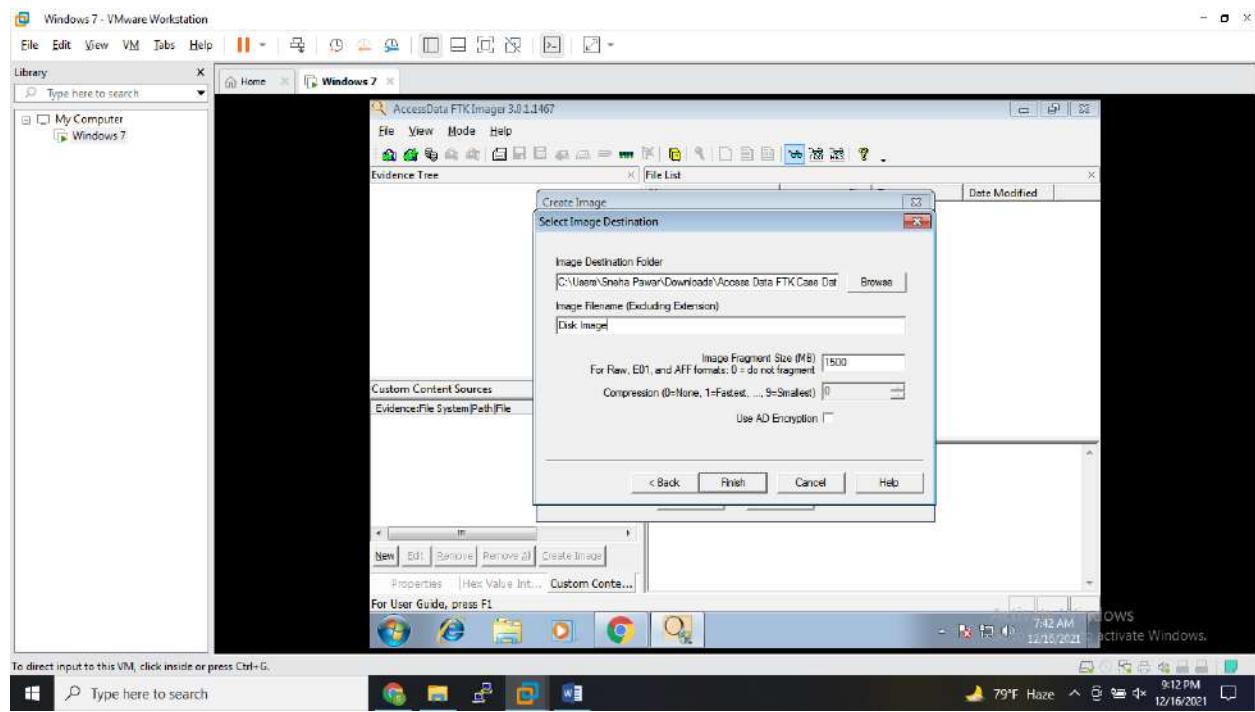


Fill the evidence item information.

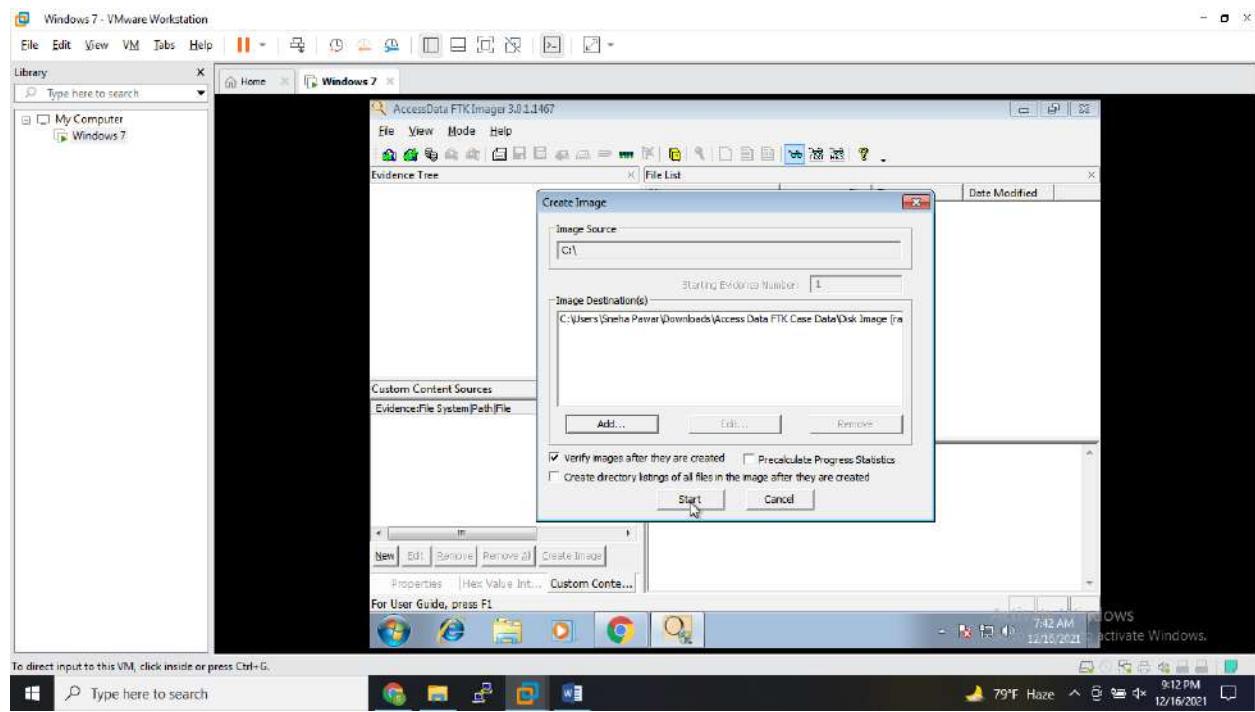


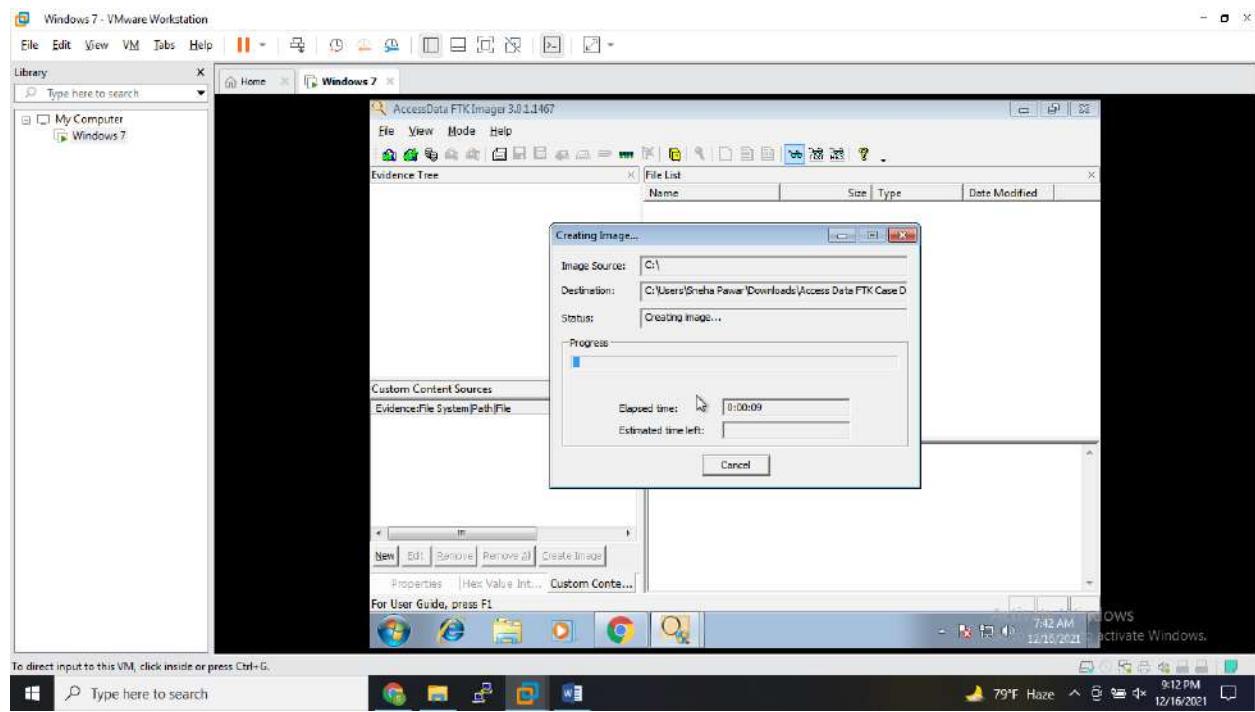
And browse for the location where you want to store the case data.





Then click on Start.





It will create the hashes of the data and verify it. After The Processing, A Dialog Box Will Show the Results.

Drive/Image Verify Results	
diskImage.001	
Name	diskImage.001
Sector count	60749824
MDS Hash	
Computed hash	62a554ae2ec2796a563521ba7921c084
Report Hash	62a554ae2ec2796a563521ba7921c084
Verify result	Match
SHA1 Hash	
Computed hash	5829ccb87ad68703b243a7d3a18e2c8328
Report Hash	5829ccb87ad68703b243a7d3a18e2c8328
Verify result	Match
Bad Sector List	
Bad sector(s)	No bad sectors found
Close	

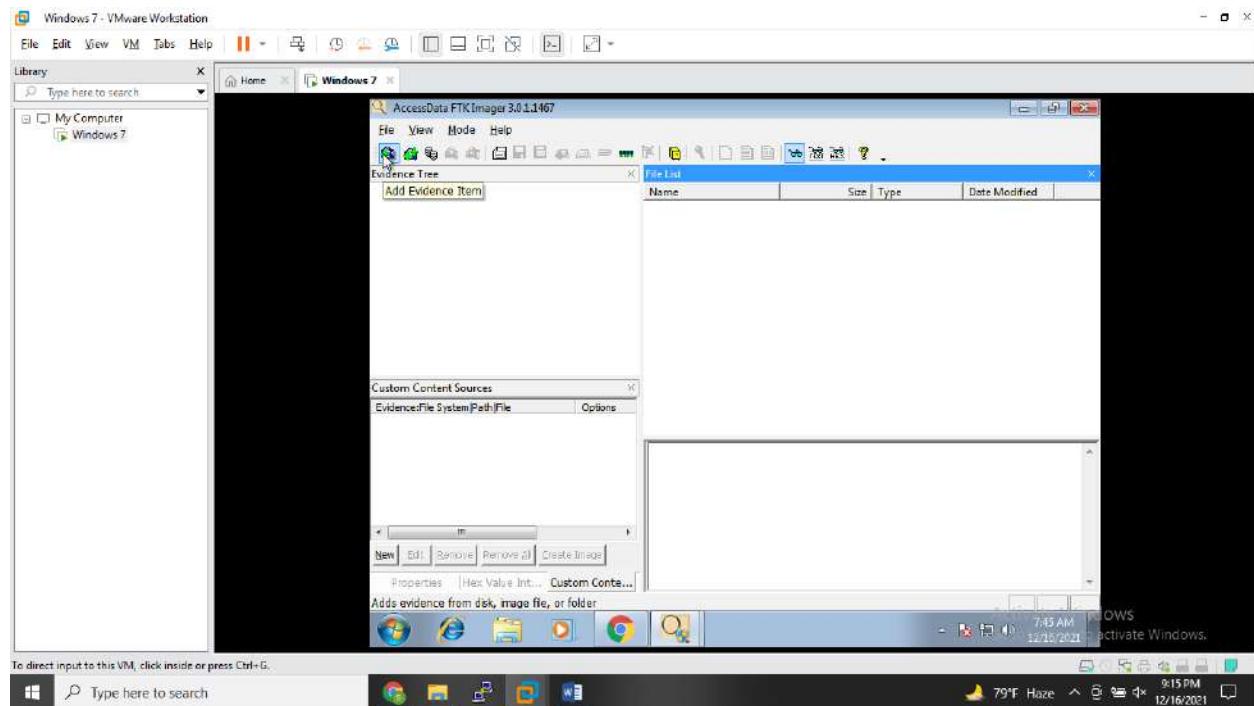
Practical No. 05

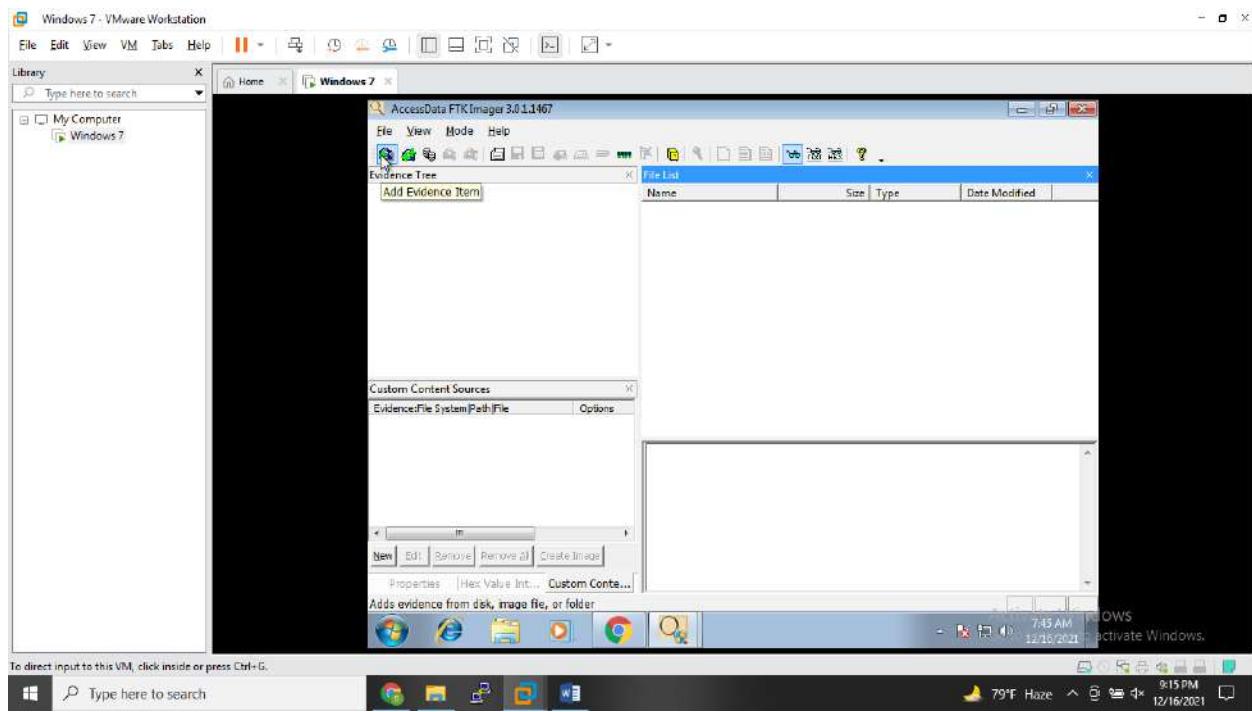
Aim: File Recovery Tools [FTK Imager] using evidence

What is FTK Imager?

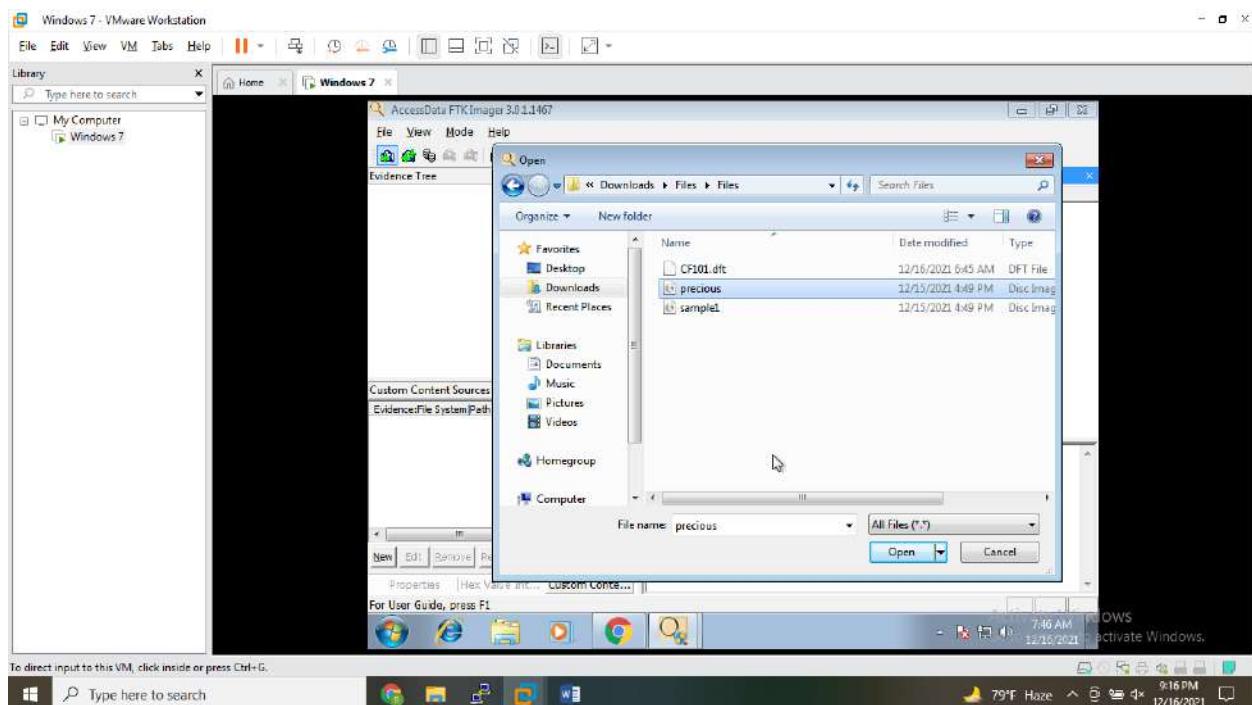
FTK® Imager is a **data preview and imaging tool used to acquire data (evidence) in a forensically sound manner** by creating copies of data without making changes to the original evidence. ... Export files and folders from forensic images.

Open Access Data FTK Imager and click on Add Evidence Item.

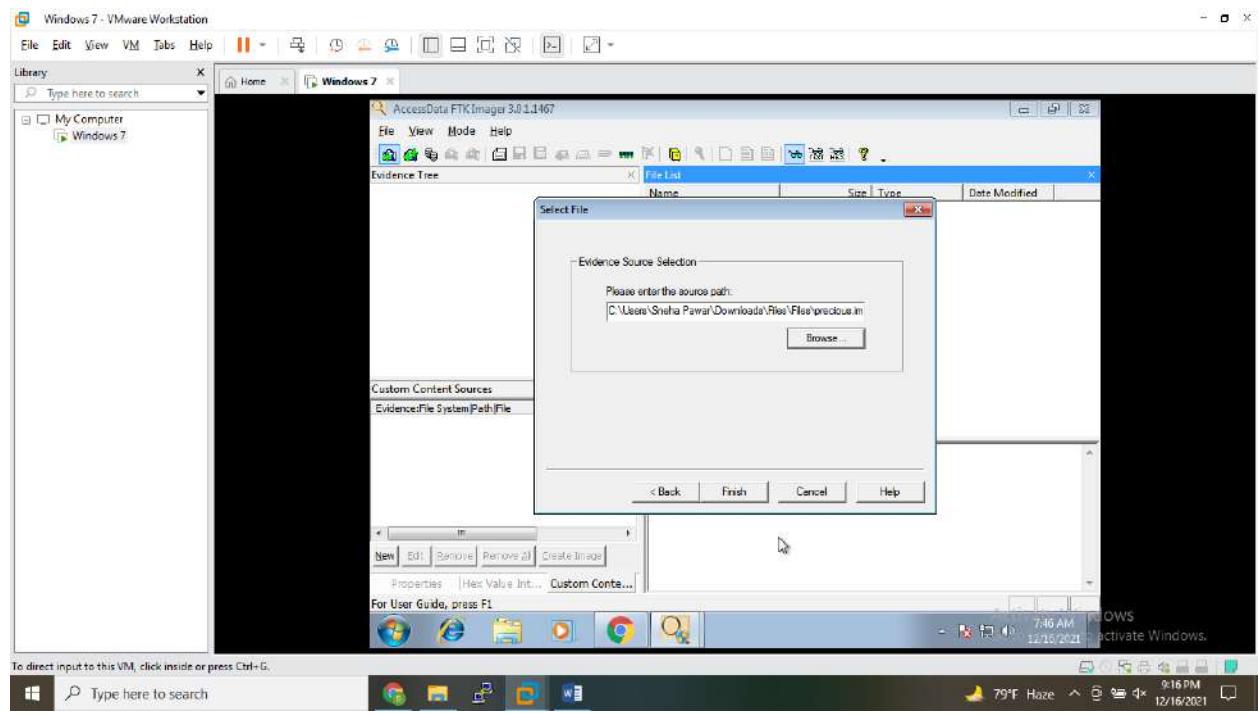




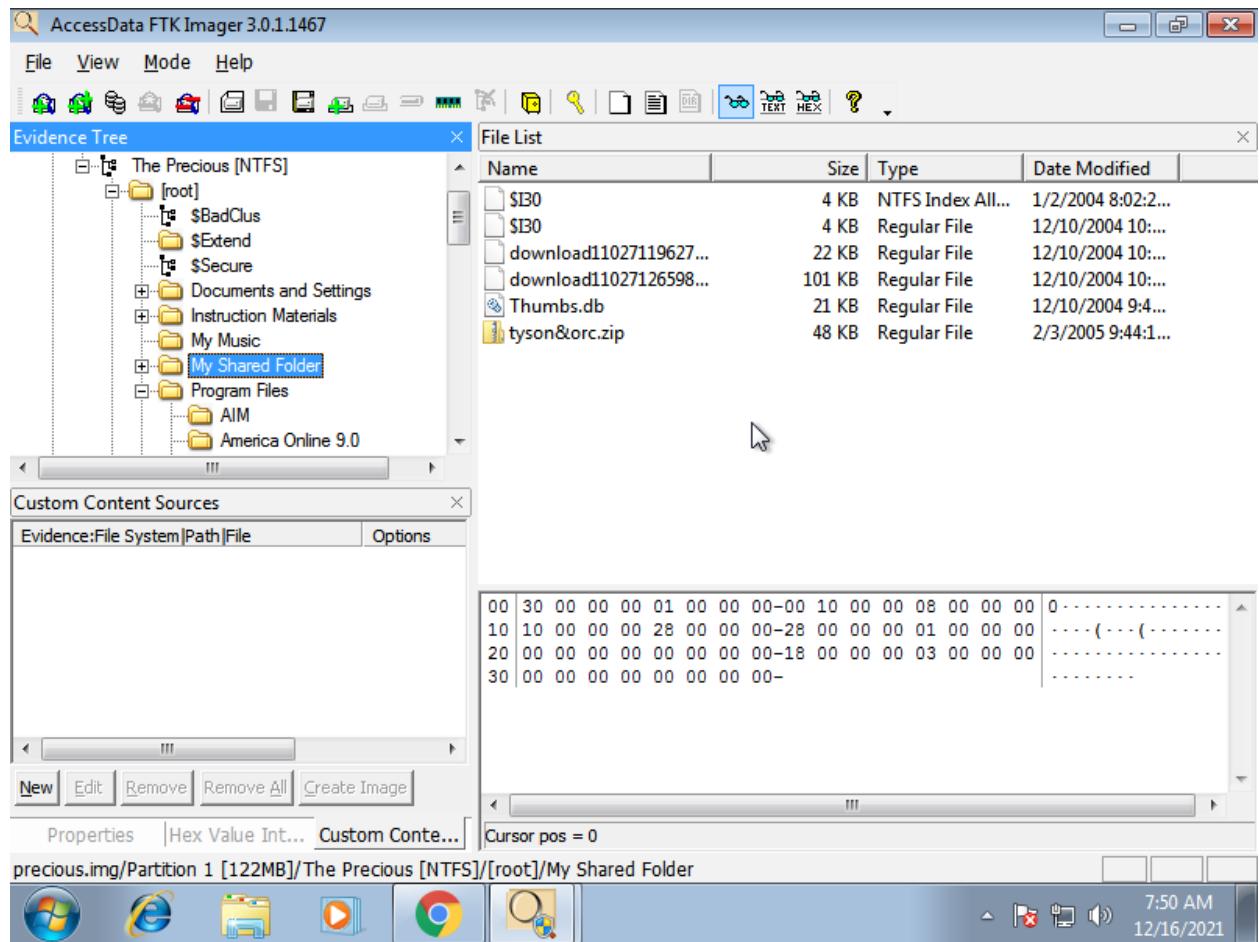
And browse for the precious.img disk image file to add as an evidence.

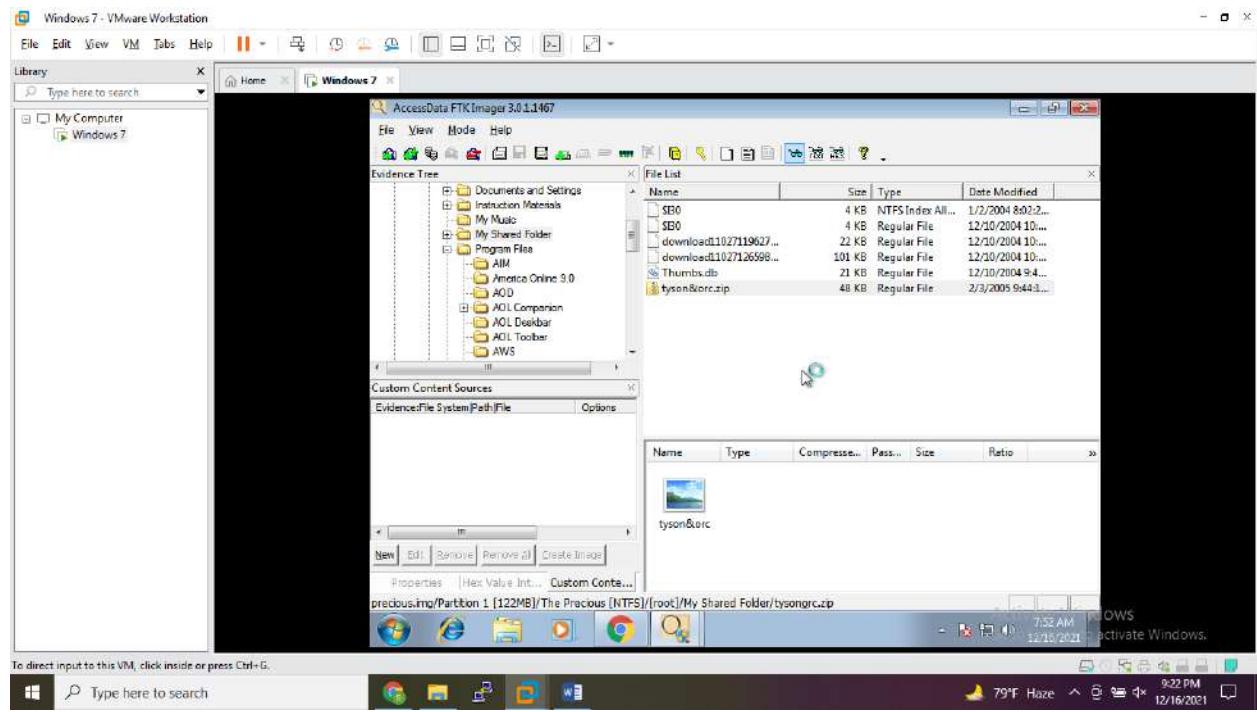


Click on Finish.



Click on My shared folder.





Practical No. 06

Aim: Forensic Investigation Using Steganography Tools [S-Tools].

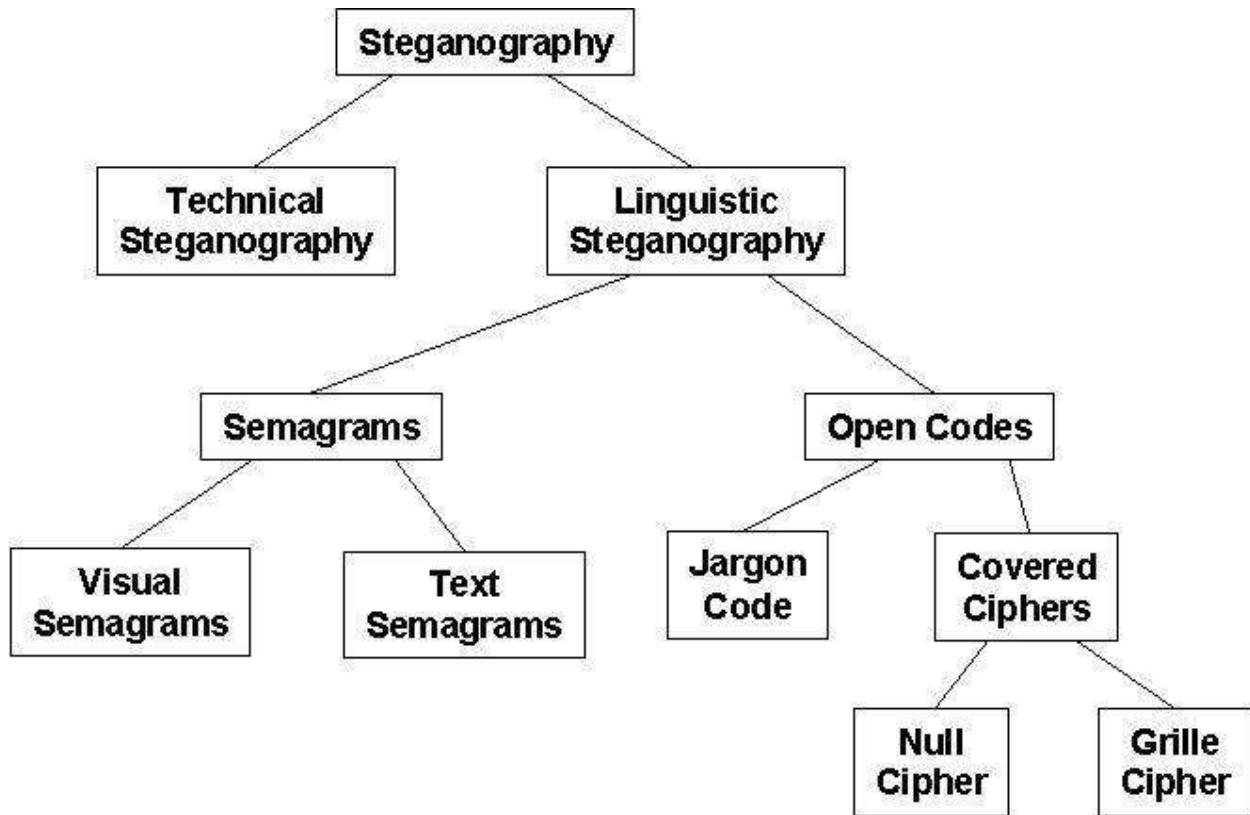
What is Steganography?

Steganography is the art of covered or hidden writing. The purpose of steganography is covert communication to hide a message from a third party. This differs from cryptography, the art of secret writing, which is intended to make a message unreadable by a third party but does not hide the existence of the secret communication. Although steganography is separate and distinct from cryptography, there are many analogies between the two, and some authors categorize steganography as a form of cryptography since hidden communication is a form of secret writing (Bauer 2002). Nevertheless, this paper will treat steganography as a separate field.

Although the term steganography was only coined at the end of the 15th century, the use of steganography dates back several millennia. In ancient times, messages were hidden on the back of wax writing tablets, written on the stomachs of rabbits, or tattooed on the scalp of slaves. Invisible ink has been in use for centuries-for fun by children and students and for serious espionage by spies and terrorists. Microdots and microfilm, a staple of war and spy movies, came about after the invention of photography (Arnold et al. 2003; Johnson et al. 2001; Kahn 1996; Wayner 2002).

Steganography hides the covert message but not the fact that two parties are communicating with each other. The steganography process generally involves placing a hidden message in some transport medium, called the carrier. The secret message is embedded in the carrier to form the steganography medium. The use of a steganography key may be employed for encryption of the hidden message and/or for randomization in the steganography scheme. In summary:

$$\text{steganography_medium} = \text{hidden_message} + \text{carrier} + \text{steganography_key}$$



What is S – Tool?

Steganography “Covered Writing”

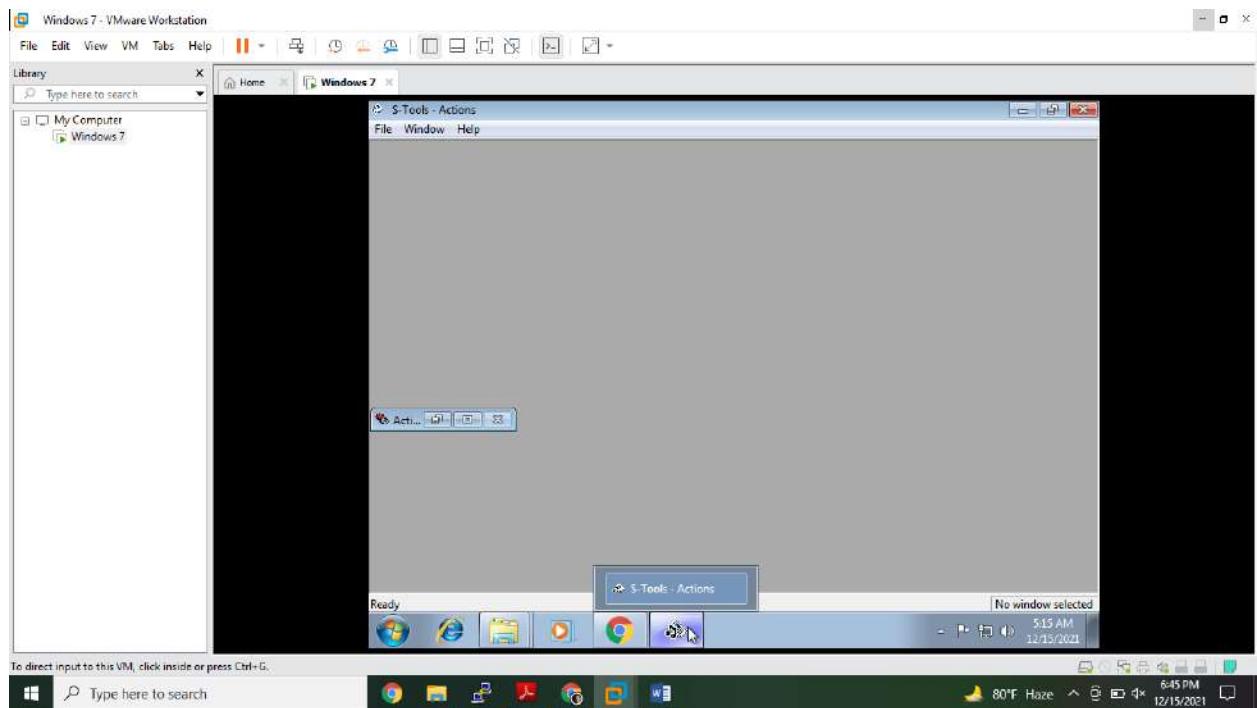
Steganography tools provide a method that allows a user to hide a file in plain sight. For example, there are a number of stego software tools that allow the user to hide one image inside another. Some of these do it by simply appending the “hidden” file at the tail end of a JPEG file and then add a pointer to the beginning of the file. The most common way that steganography is discovered on a machine is through the detection of the steganography software on the machine. Then comes the arduous task of locating 11 of the files that may possibly contain hidden data. Other, more manual stego techniques may be as simple as hiding text behind other text. In Microsoft Word, text boxes can be placed right over the top of other text, formatted in such a way as to render the text undetectable to a casual observer. Forensic tools will allow the analyst to locate this text, but on opening the file the text won’t be readily visible. Another method is to hide images behind other images using the layers feature of some photo enhancement tools, such as Photoshop.

StegAlyzerAS is a tool created by Backbone Security to detect steganography on a system. It works by both searching for known stego artifacts as well as by searching for the program files associated with over 650 steganography toolsets. Steganography hash sets are also available within the NIST database of hash sets. Hash sets are databases of MD5 hashes of known unique files associated with a particular application.

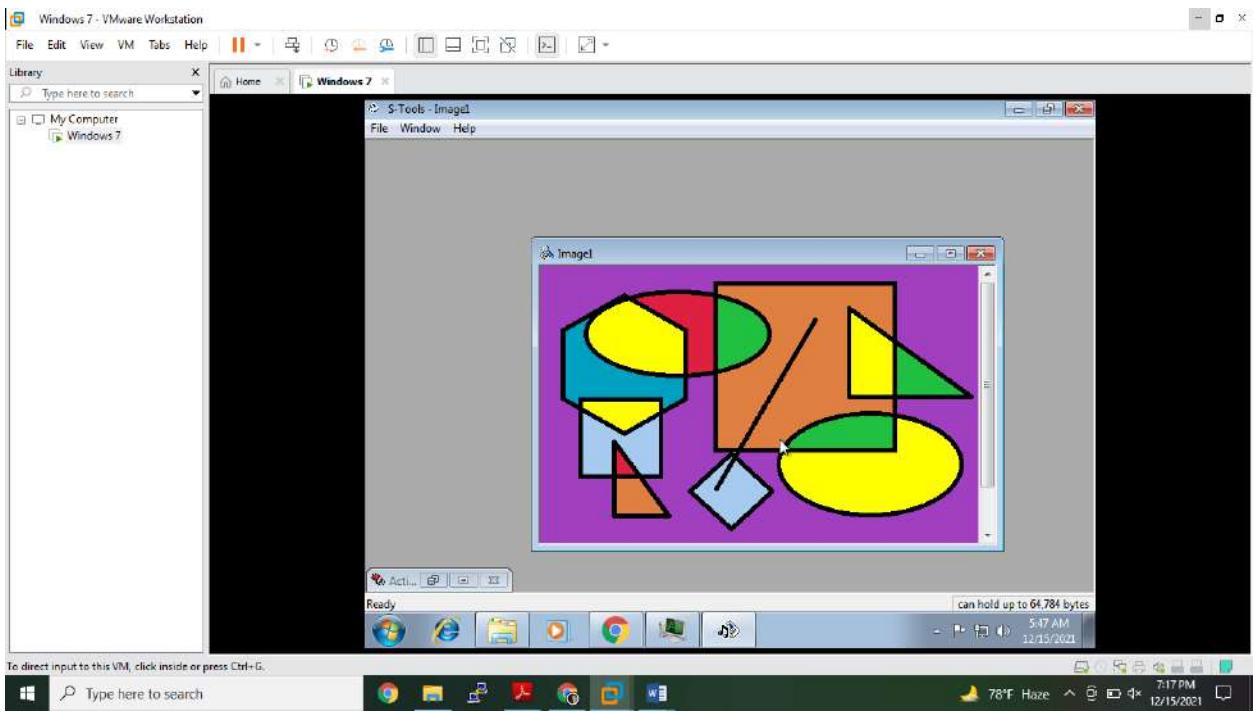
Steps:

Here we are going to hide our textual content in an image file.

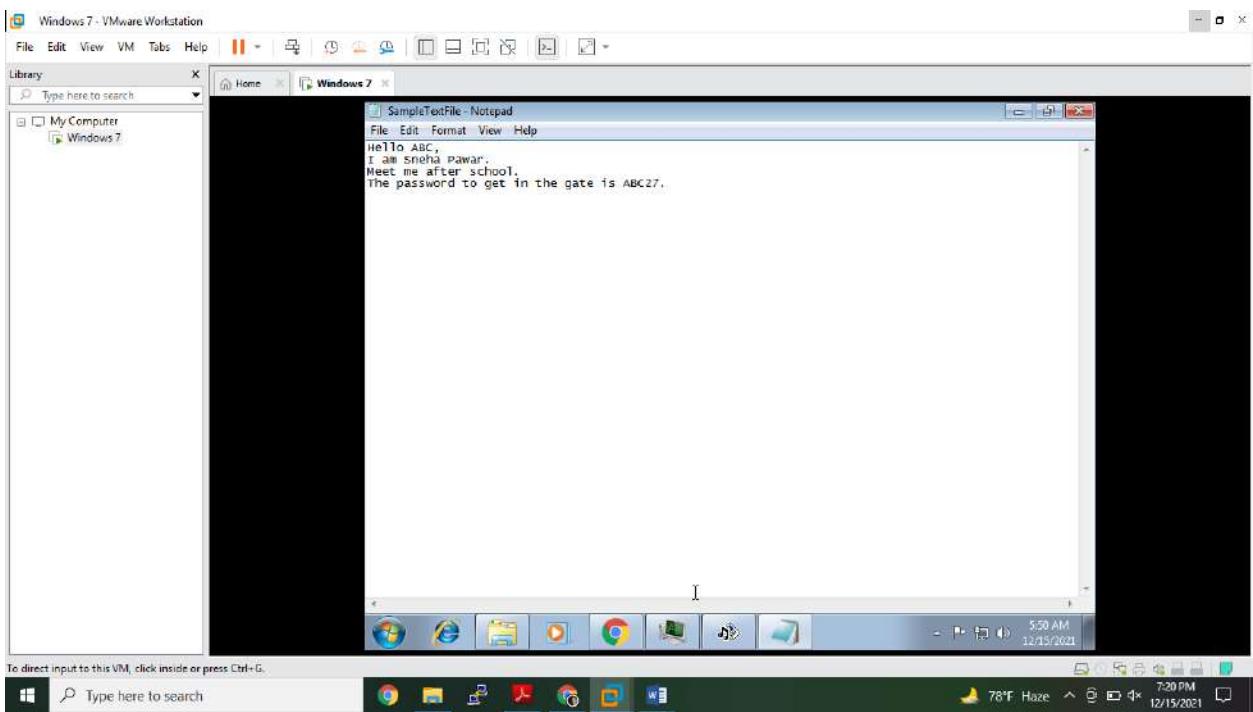
After opening S – Tool Software the interface will look like below.



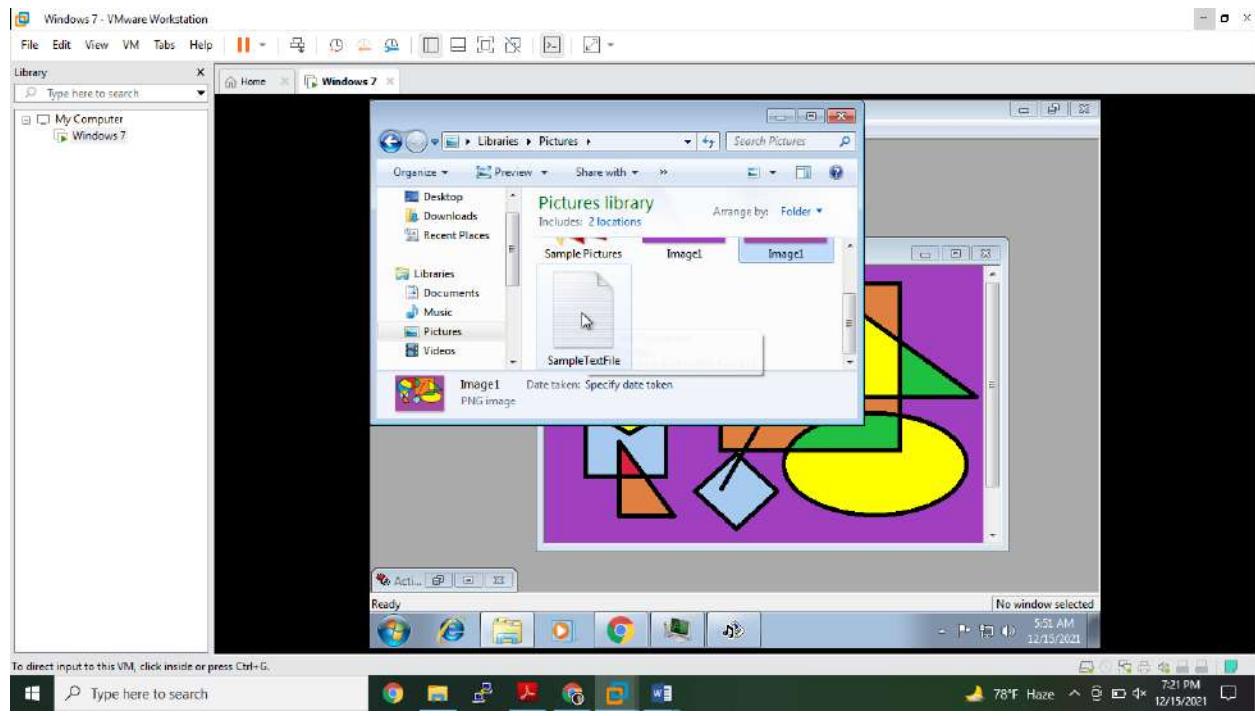
The S – Tool only supports GIF or BMP image files. So drag and drop any image on S – Tool.



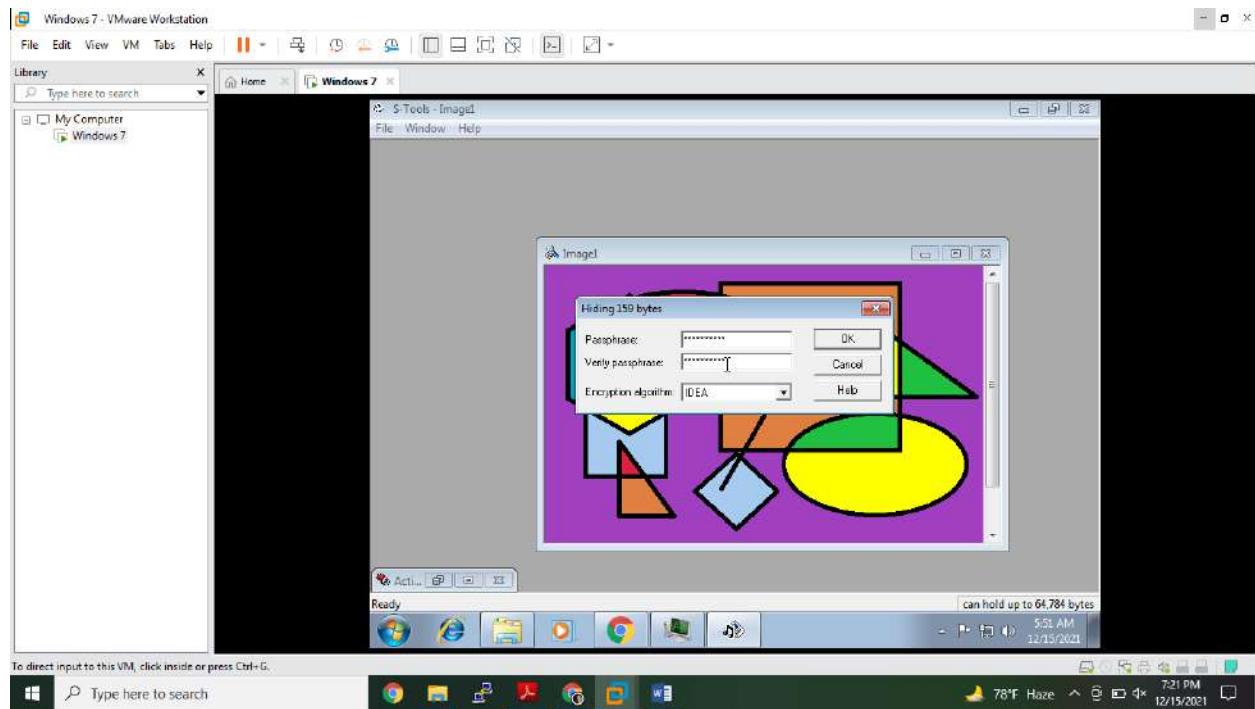
Now create one text file. Type any content that you want to in it.

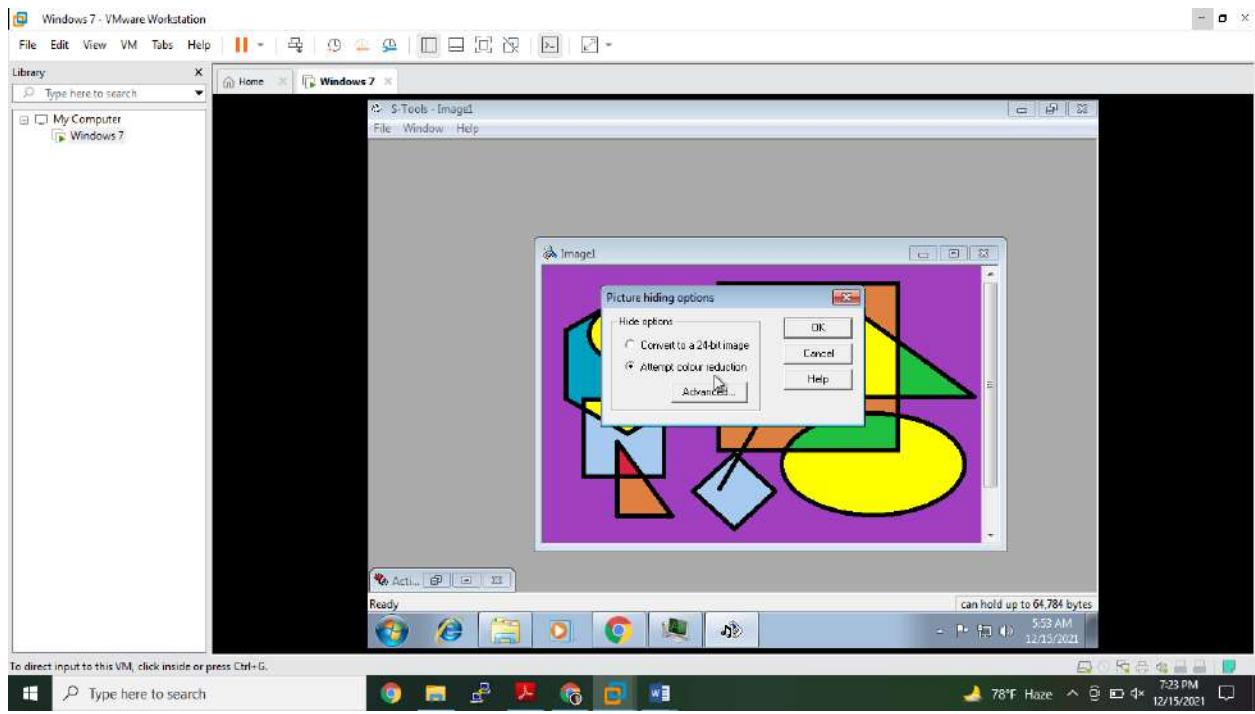


Drag and drop the text file onto the image.

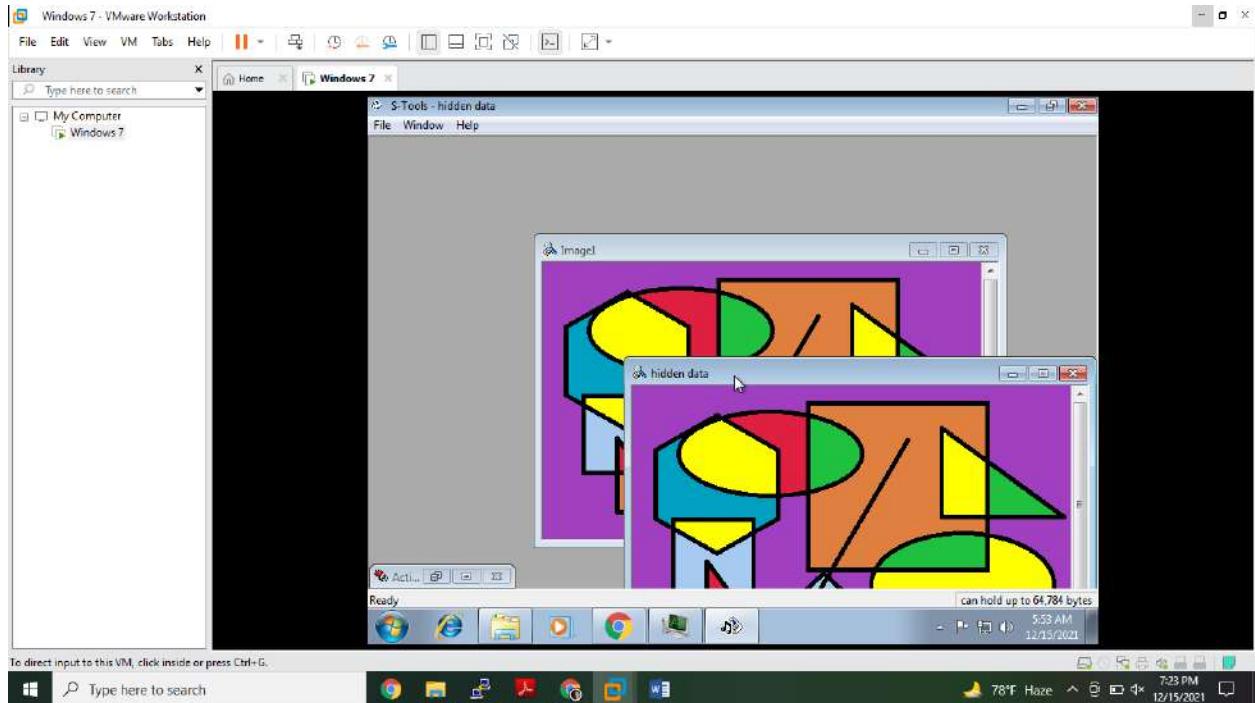


Now enter passphrase, you can type here any type of password.
I have typed here, as Sneha@12345.

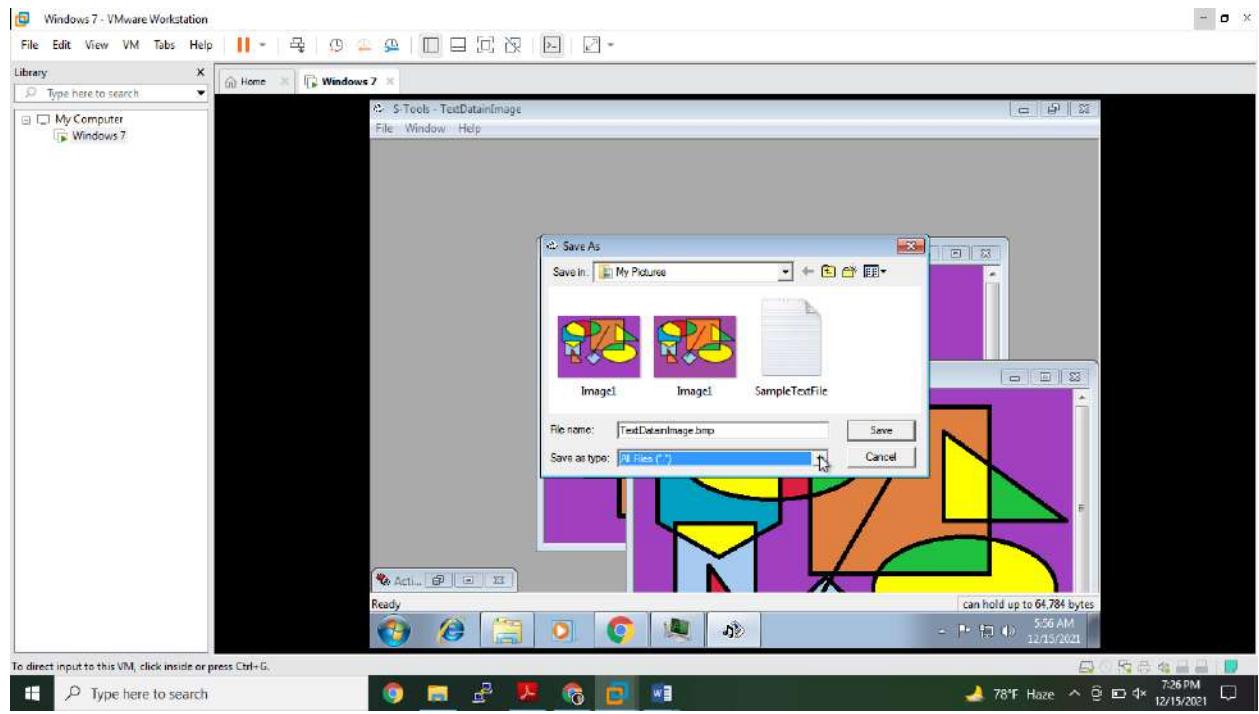




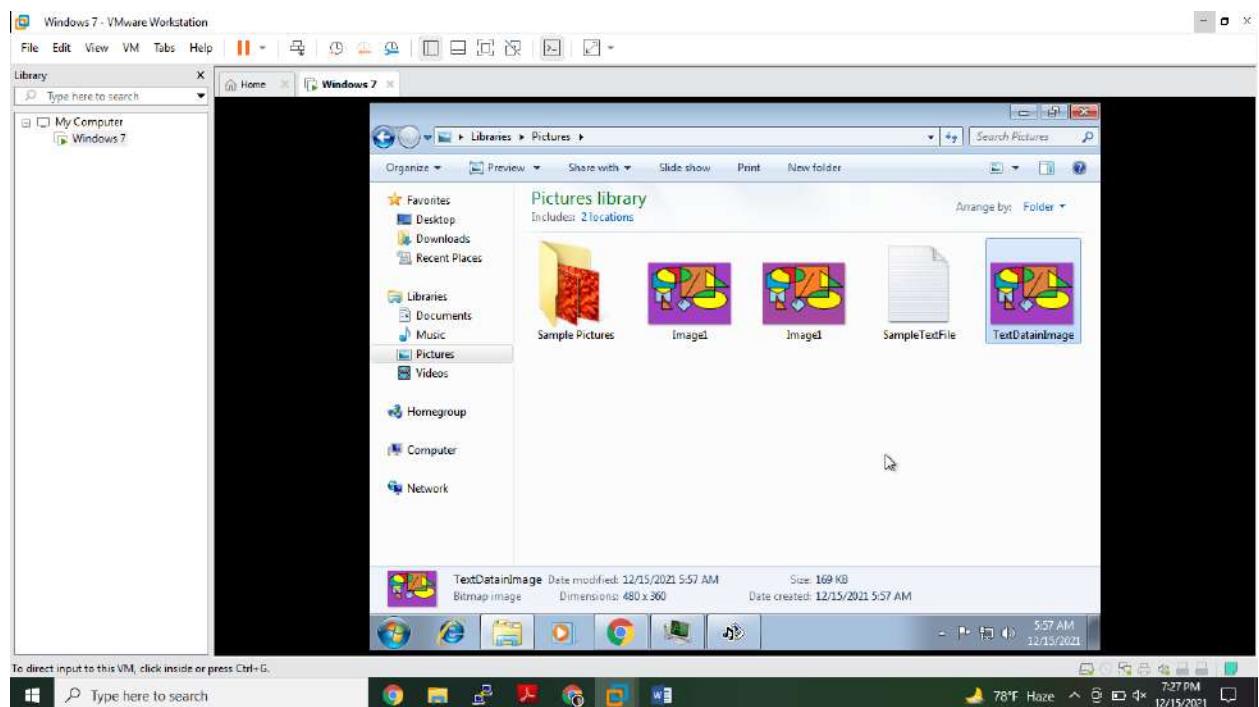
Now here is your hidden data.



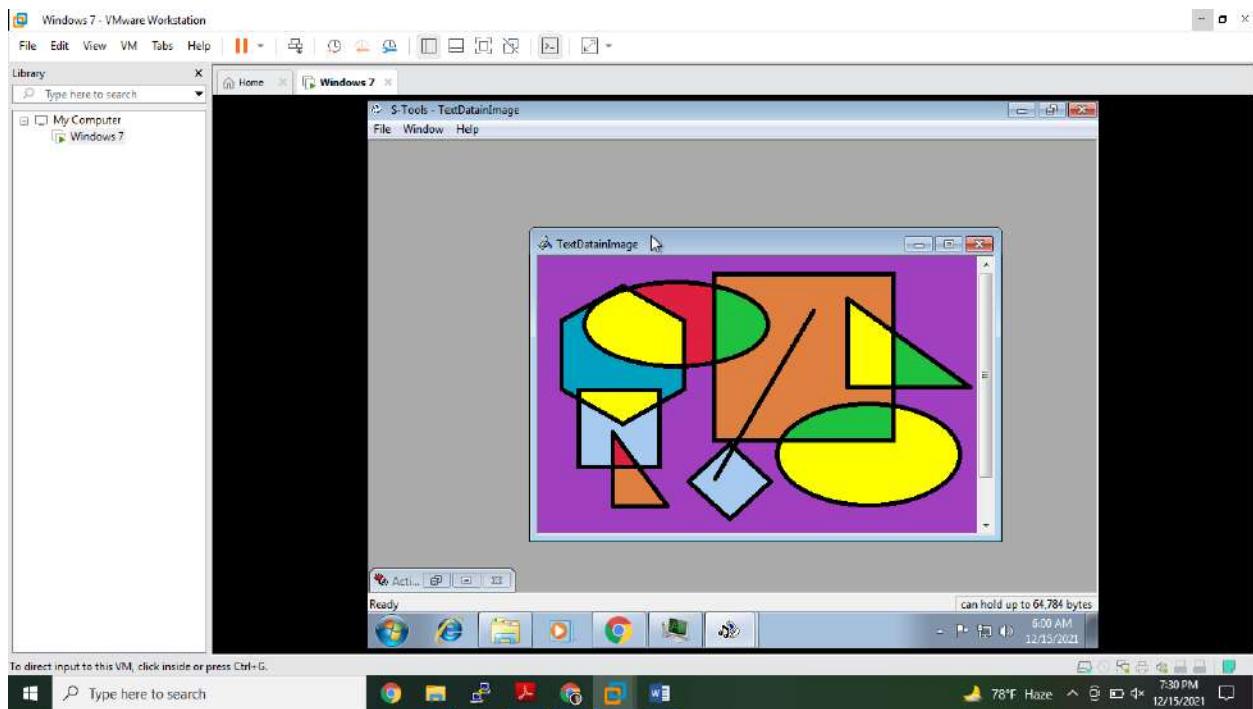
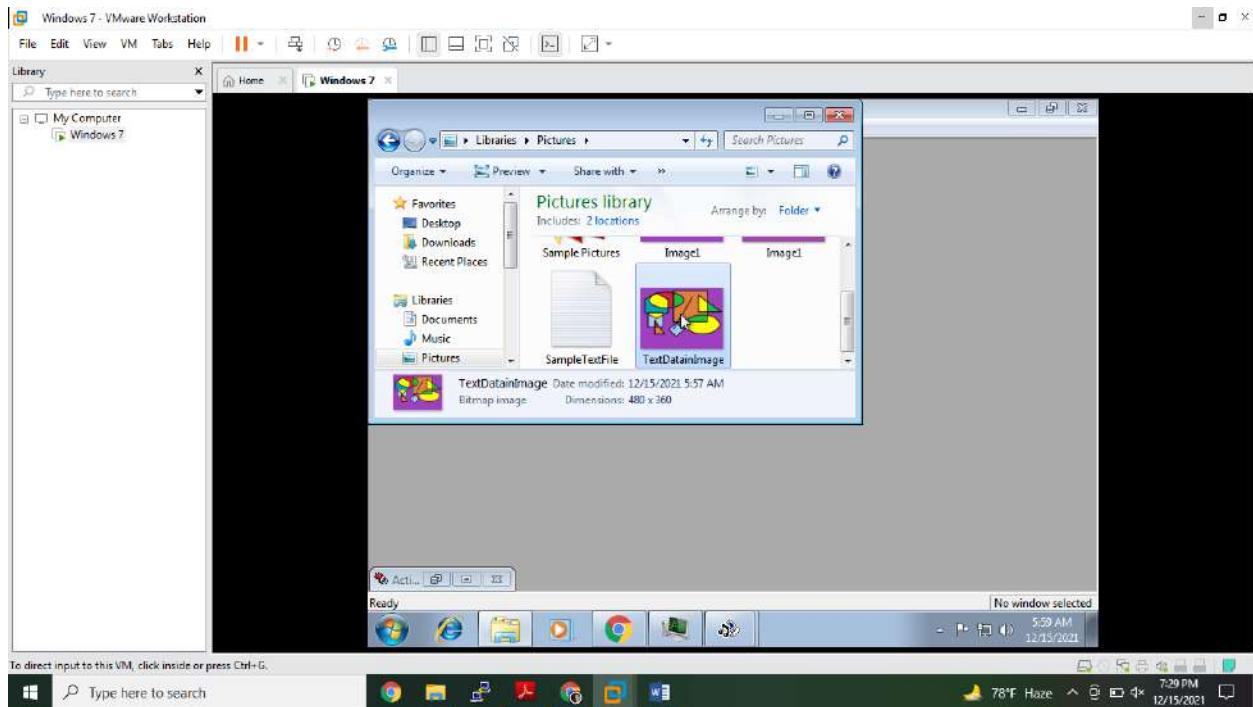
Right click on it, and save it as TextDatainImage.



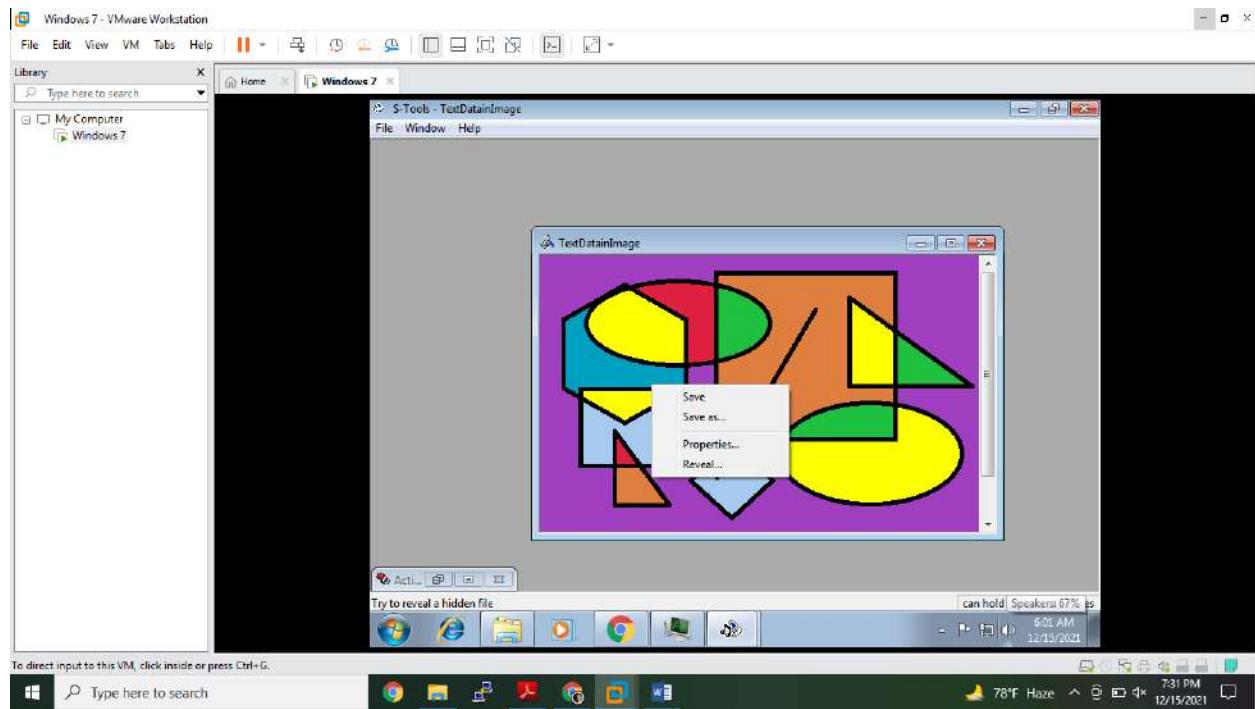
So here is your image file which has hidden text data in it.



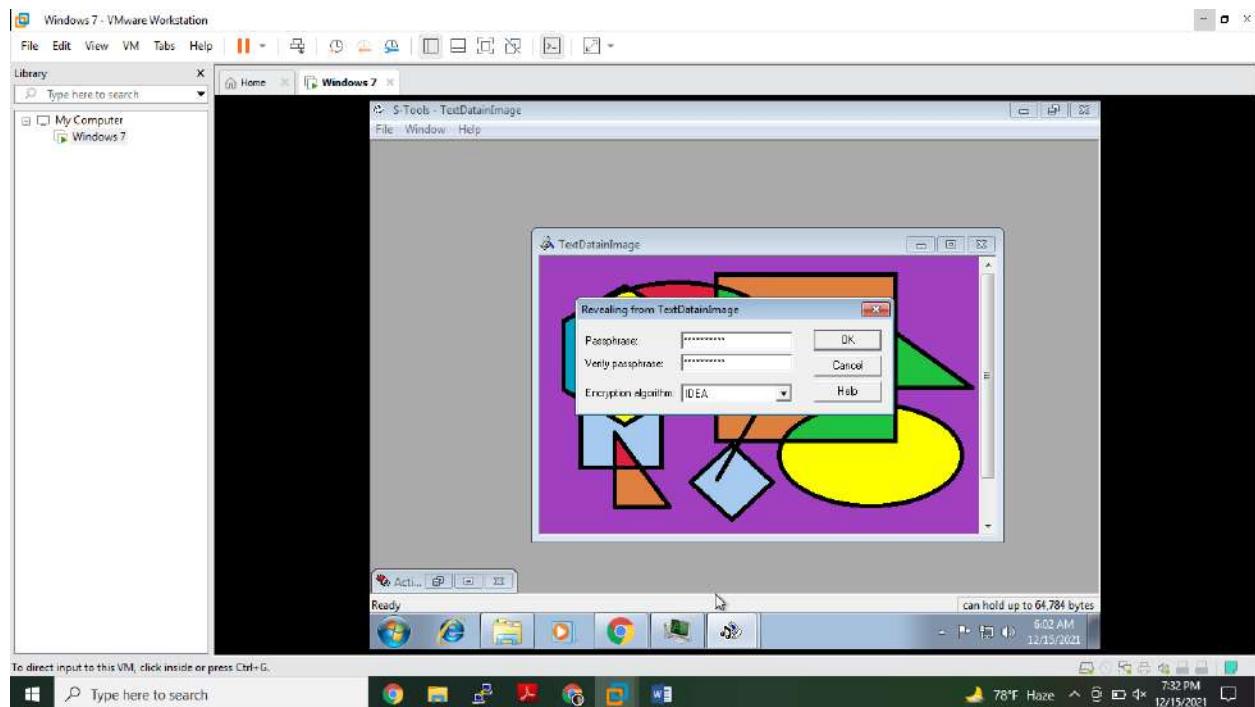
Again open the S – Tool , and drag and drop the Image file which have the text data hidden in it.

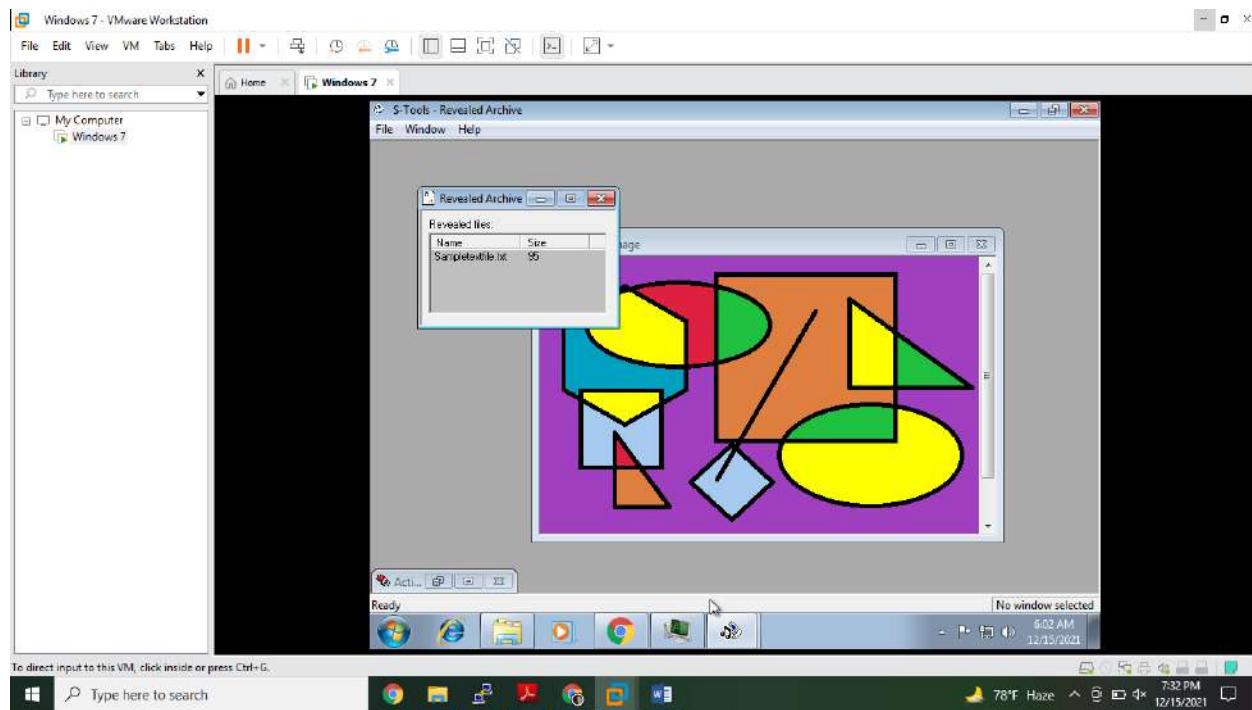


Right click on image and click on Reveal.

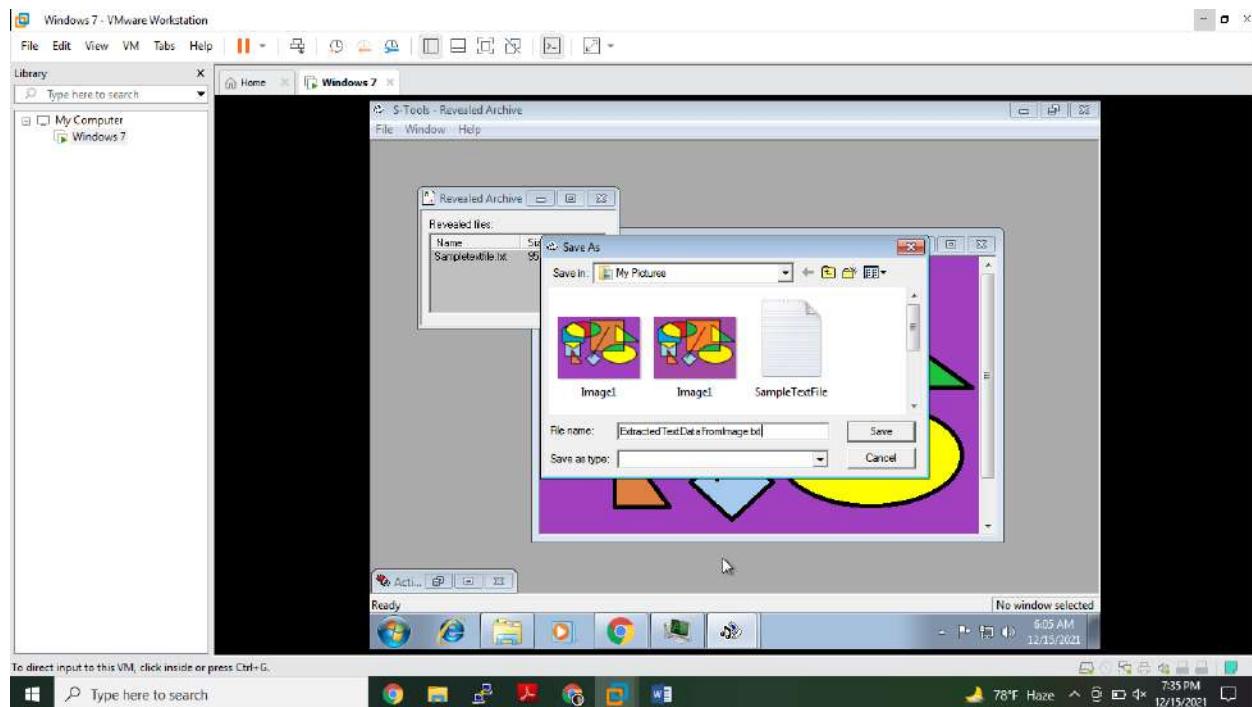


Enter the passphrase. And click on Ok

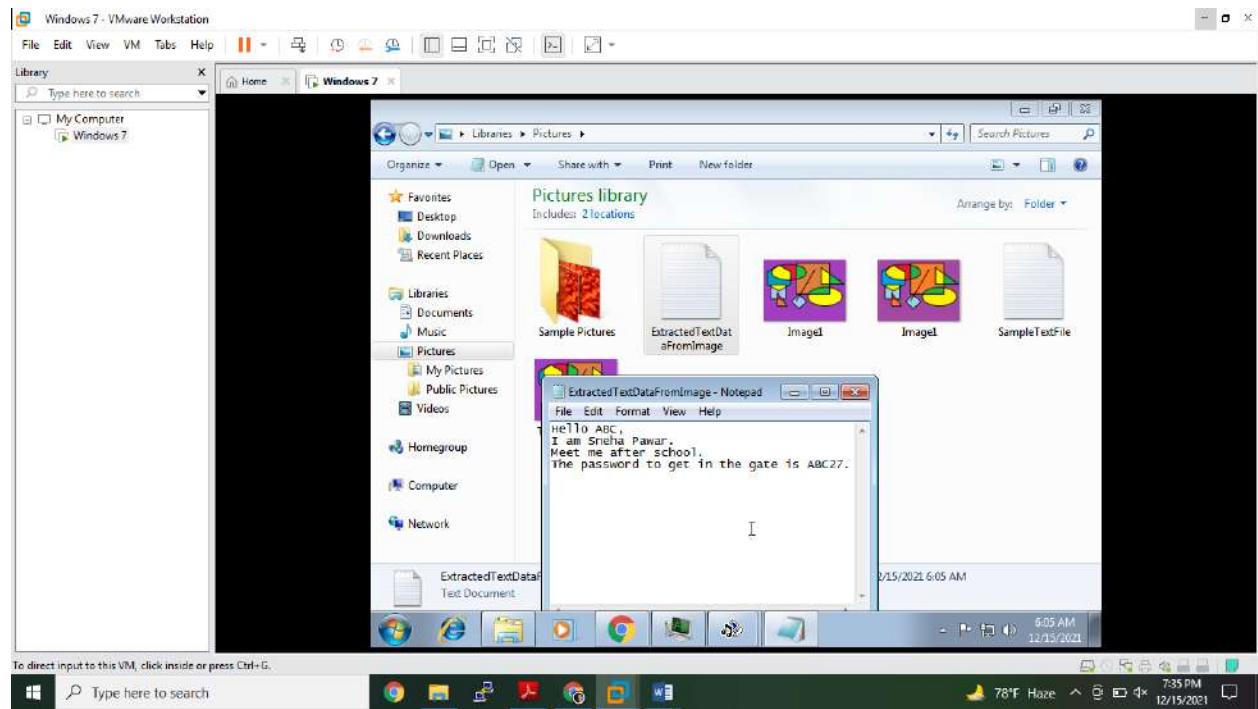




Right click on the Text file and save it as ExtractedTextDataFromImage.



Here is your extracted content from an image.



Practical No. 07

Aim: Using Log and Traffic Capturing and Analysis Tools [Wireshark].

Wireshark is a network protocol analyzer, or an application that captures packets from a network connection, such as from your computer to your home office or the internet. Packet is the name given to a discrete unit of data in a typical Ethernet network.

Wireshark is the most often-used packet sniffer in the world. Like any other packet sniffer, Wireshark does three things:

1. **Packet Capture:** Wireshark listens to a network connection in real time and then grabs entire streams of traffic – quite possibly tens of thousands of packets at a time.
2. **Filtering:** Wireshark is capable of slicing and dicing all of this random live data using filters. By applying a filter, you can obtain just the information you need to see.
3. **Visualization:** Wireshark, like any good packet sniffer, allows you to dive right into the very middle of a network packet. It also allows you to visualize entire conversations and network streams.
4. Packet sniffing can be compared to spelunking – going inside a cave and hiking around. Folks who use Wireshark on a network are kind of like those who use flashlights to see what cool things they can find. After all, when using Wireshark on a network connection (or a flashlight in a cave), you’re effectively using a tool to hunt around tunnels and tubes to see what you can see.

What Is Wireshark Used For?

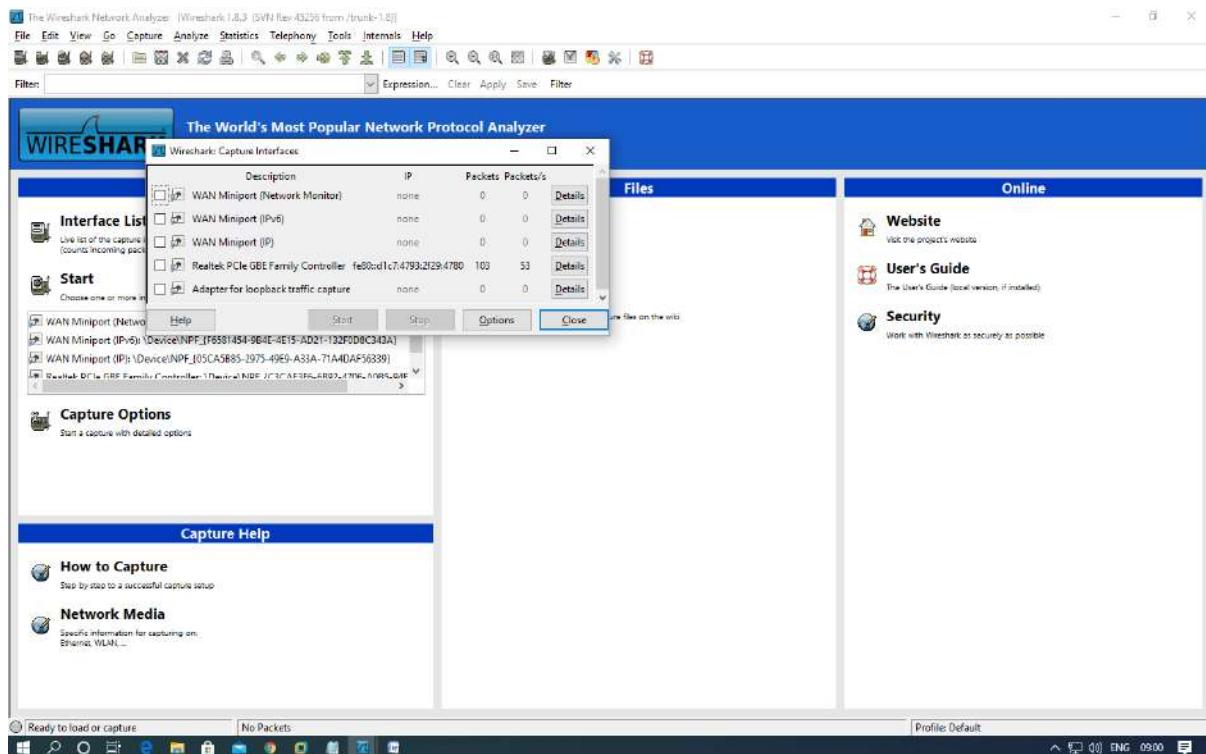
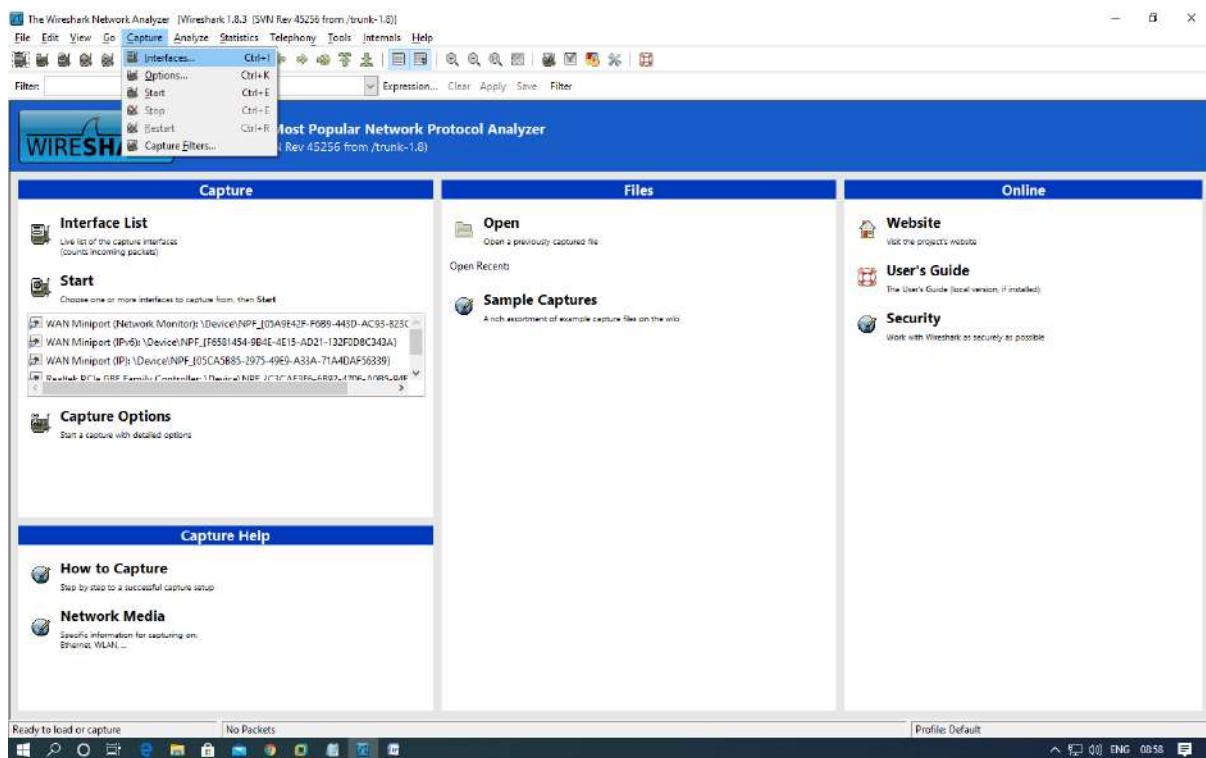
5. Wireshark has many uses, including **troubleshooting networks** that have performance issues. Cybersecurity professionals often use Wireshark to trace connections, view the contents of suspect network transactions and identify bursts of network traffic. It’s a major part of any IT pro’s toolkit – and hopefully, the IT pro has the knowledge to use it.

Steps:

Wireshark

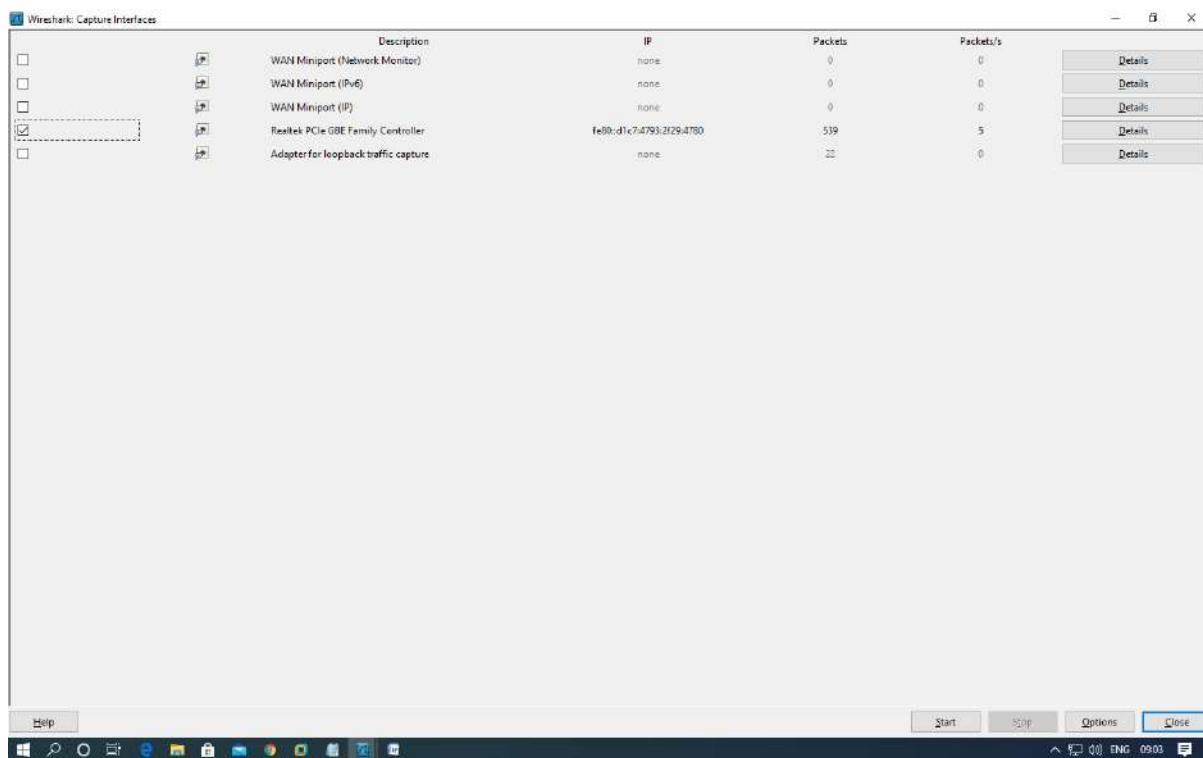
An open source protocol analyzer that can capture traffic in real time for unsecured sites..

Go to Capture - Interface.



Click on Start

Select the option as shown in image and click on start



Go to unsecured site mytaxindia or some other and do some post and get operation

Inbox (617) - sneharanmandir.com | Classwork for Aditi Ch-R MSc Rail | InCase5 - Google Drive | Outstation Taxi Booking (Online) +

Not secure | mytaxiindia.com

+91-888-200-1133 | 0124 - 6263626

mytaxiindia Smart Mobility Solutions

Attach Taxi Corporate Services MICE Packages Offers Customer Login & Signup

Local **Outstation** **City Tour** **Holidays**

One Way Return Add More Cities

Pickup City Drop City Travel Date Drop Date

Pickup City Drop City 17 DEC 2023 17 DEC 2023 SEARCH

Special Offers

SMART OFFICE COMMUTE SOLUTION **COVID -19 PROOF**

SEND INQUIRY

Capturing from Realtek PCIe GBE Family Controller: \Device\NPF_{CJCAF3E5-6B92-4706-A0B5-94FA4C8EA4D8} [Wireshark 1.8.3 (SVN Rev 43256 from /trunk-1.8)]

File Edit View Go Capture Analyze Statistics Telephony Tools Internets Help

Filter Expression... Clear Apply Save Filter

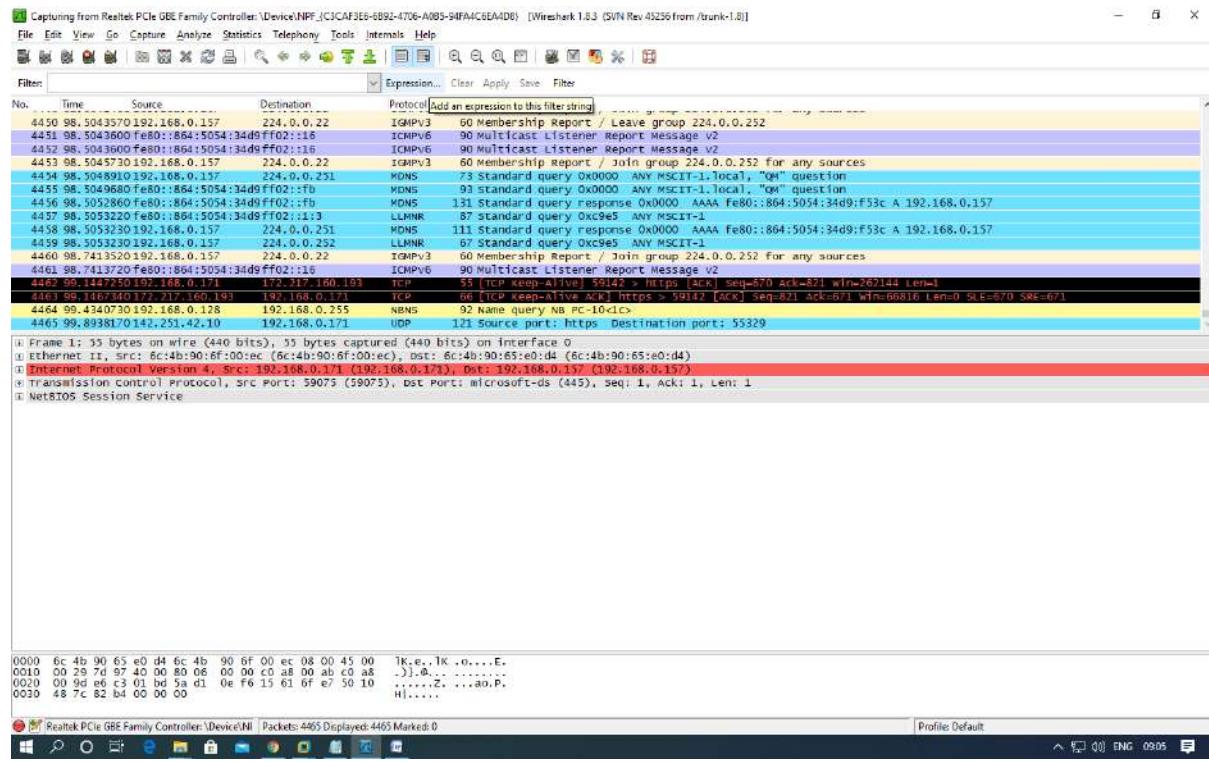
No.	Time	Source	Destination	Protocol	Length	Info
3514	32.8812970192.168.0.119	239.255.255.250		SSDP	216	M-SEARCH * HTTP/1.1
3515	32.8812860192.168.0.119	234.0.0.251		DNS	80	standard query 0x0000 A dsyvpqewydyko.local. "or" question
3516	32.88126470fe80::f1sc:bad2:da2#ff02::fb			DNS	100	standard query 0x0000 A dsyvpqewydyko.local. "or" question
3517	32.88992480192.168.0.119	239.255.255.250		SSDP	216	M-SEARCH * HTTP/1.1
3518	32.89995480192.168.0.119	234.0.0.251		DNS	77	standard query 0x0000 A gyuaspchcw.local. "or" question
3519	32.8998130fe80::f15c:bad2:da2#ff02::fb			DNS	97	standard query 0x0000 A gyuaspchcw.local. "or" question
3520	32.0818860192.168.0.171	142.251.10.189		UDP	75	source port: 50774 destination port: https
3521	33.06235480142.251.10.189	192.168.0.171		UDP	68	source port: https destination port: 50774
3522	33.1967570192.168.0.119	239.255.255.250		SSDP	179	M-SEARCH * HTTP/1.1
3523	33.27086100192.168.0.171	142.251.10.189		UDP	75	source port: 50774 destination port: https
3524	33.3439350192.168.0.119	192.168.0.255		NBNS	92	Name query NB GSXJKGQJSMCJVOON<00>
3525	33.3476500142.251.10.189	192.168.0.171		UDP	68	source port: https destination port: 50774
3526	33.3999250192.168.0.119	192.168.0.255		NBNS	92	Name query NB DSVPYQMVVNDYK<00>
3527	33.41653120192.168.0.119	192.168.0.255		NBNS	92	Name query NB GYUASPCHCW<00>
3528	33.5518310192.168.0.171	142.251.10.189		UDP	75	source port: 50774 destination port: https
3529	33.6285470142.251.10.189	192.168.0.171		UDP	68	source port: https destination port: 50774

Frame 1: 35 bytes on wire (440 bits), 35 bytes captured (440 bits) on interface 0
 ① ethernet II, src: 8c:4b:90:6f:00:ec (8c:4b:90:6f:00:ec), dst: 6c:4b:90:65:e0:d0 (6c:4b:90:65:e0:d0)
 ② Internet Protocol Version 4, Src: 192.168.0.171 (192.168.0.171), Dst: 192.168.0.157 (192.168.0.157)
 ③ Transmission control protocol, Src Port: 59075 (59075), Dst Port: microft-ds (445), Seq: 1, Ack: 1, Len: 1
 ④ NetBIOS Session Service

0000 6c 4b 90 65 e0 d4 6c 4b 90 6f 00 ec 08 00 45 00 TKE,TKE,TKE,...
 0010 60 29 7d 97 40 00 06 00 90 c8 00 ab c0 a8 ..J...J...J...J...
 0020 00 9d e6 c3 01 00 00 06 0e f6 15 61 07 e7 50 10 ..J...J...J...J...
 0030 48 7c 82 b4 00 00 00 H.....

Profile Default

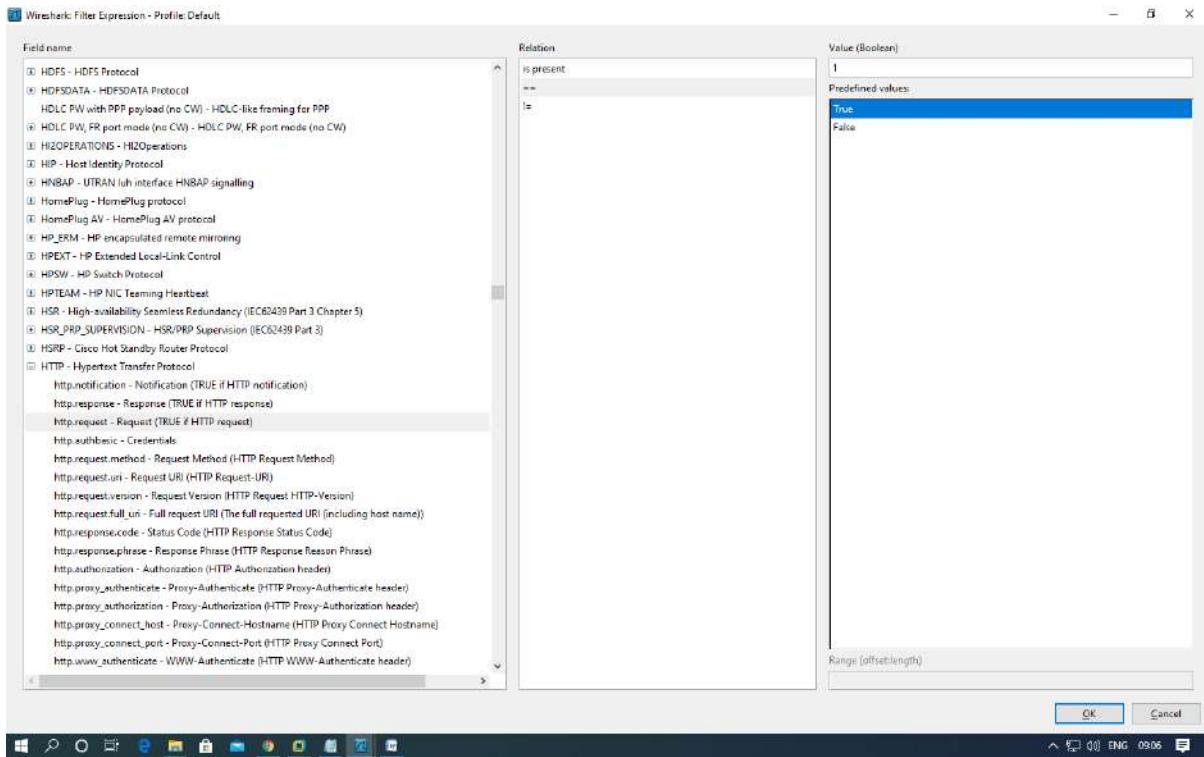
Click on Expression



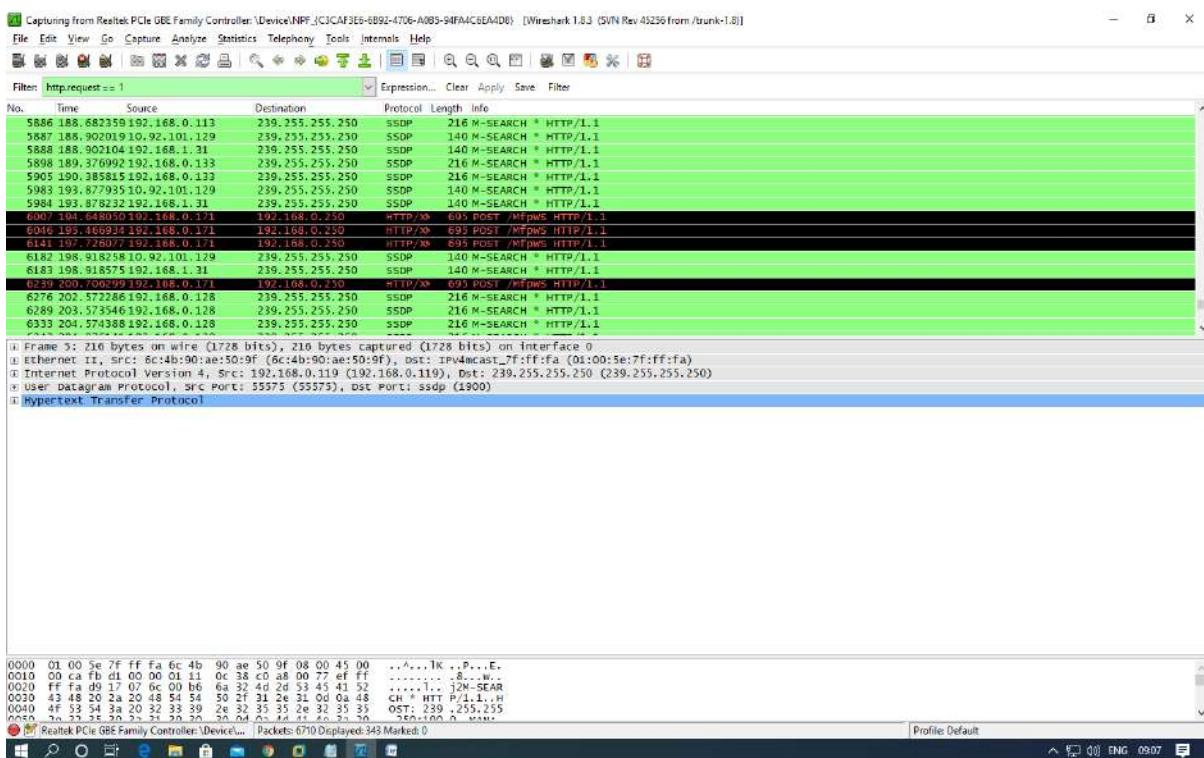
Filter Expressions Can Be Added By Clicking The Expression Button Present On The Right Side

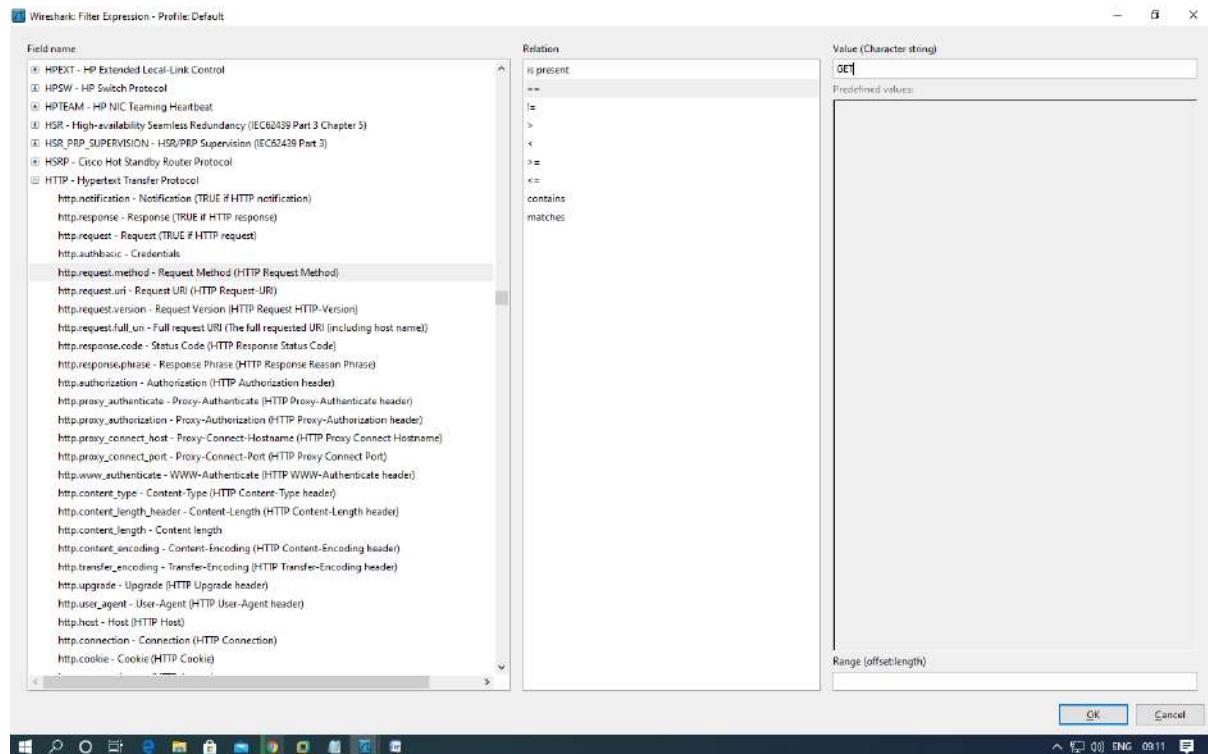
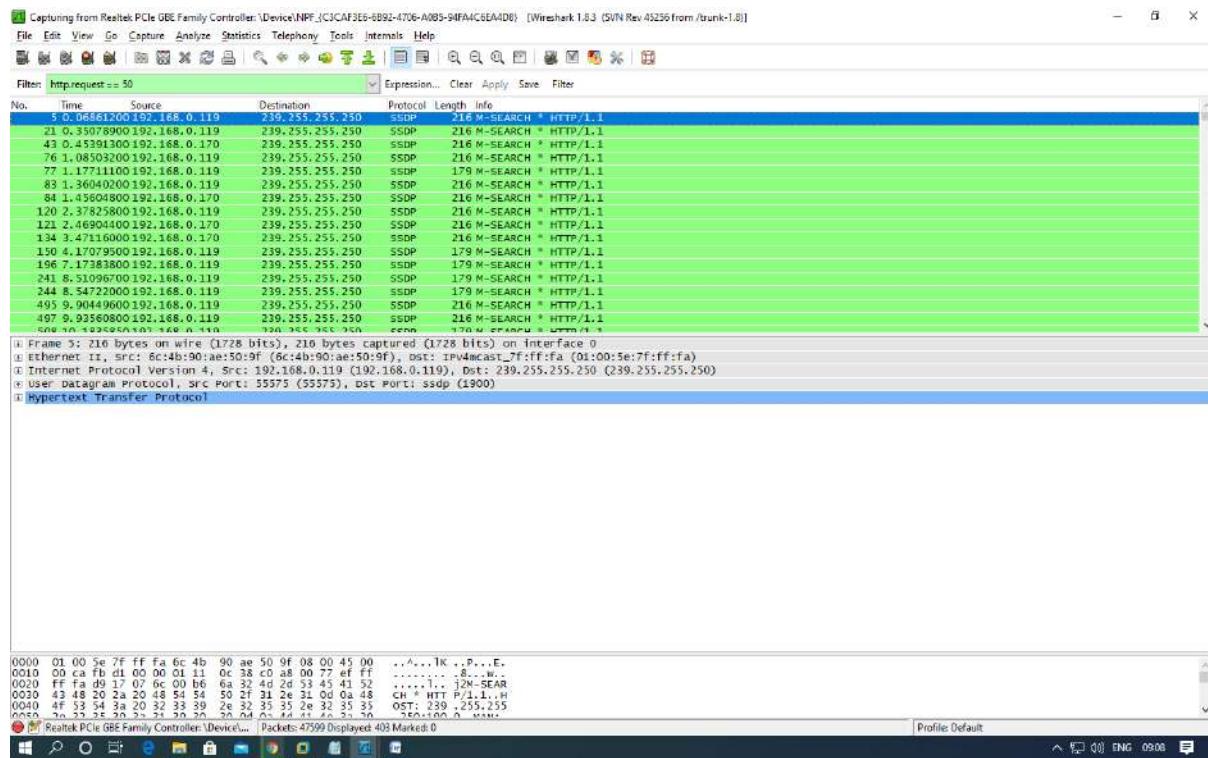
Of The Filter Bar. The Relations And The Entities Can Be Added With The Help Of The

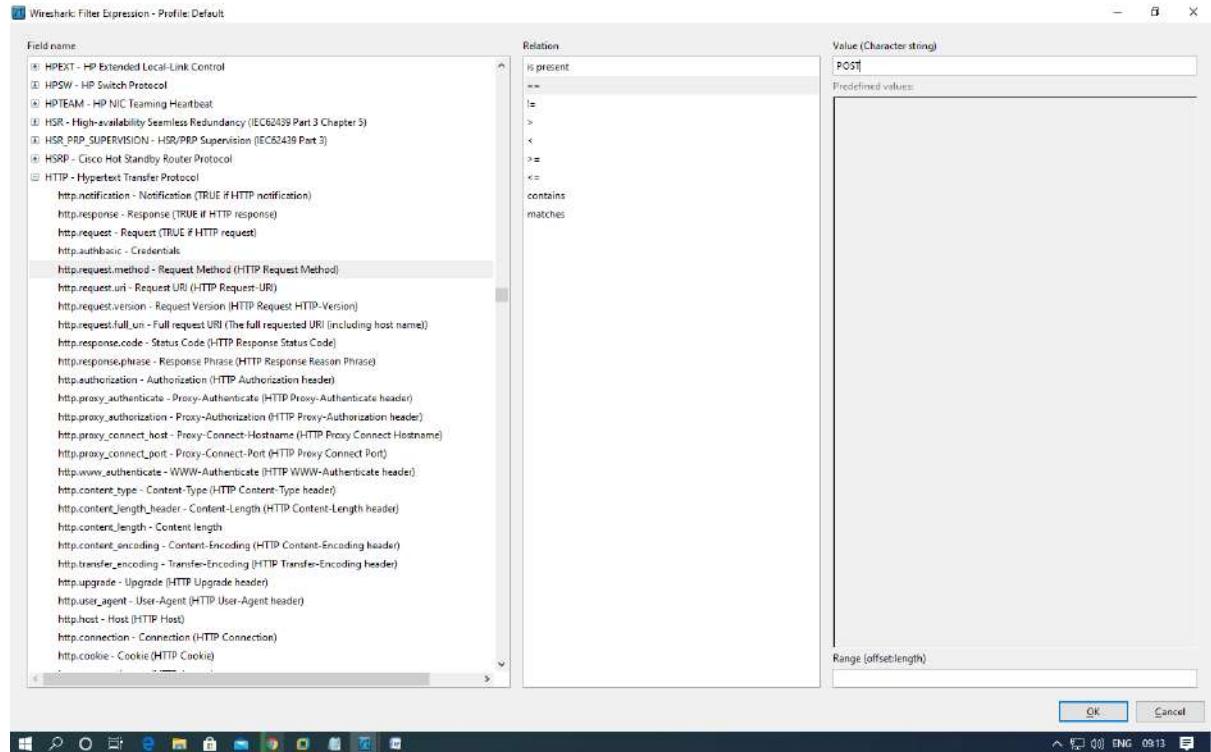
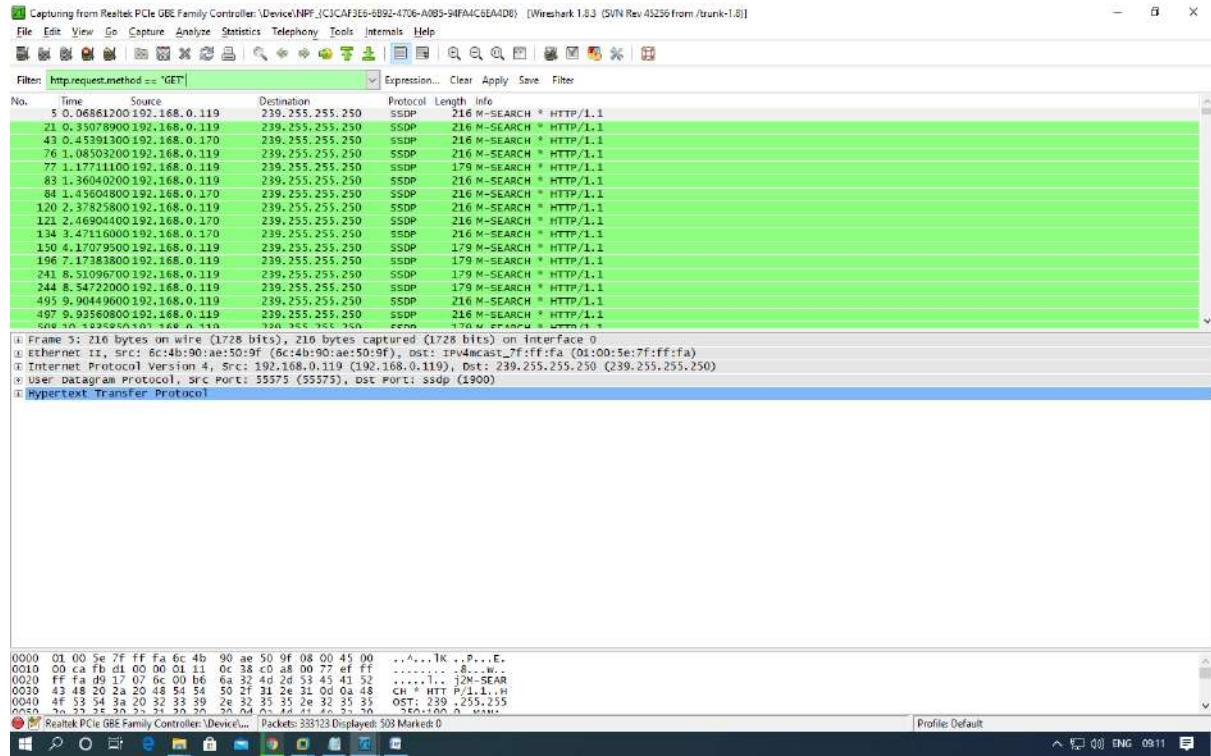
Resulting Dialog

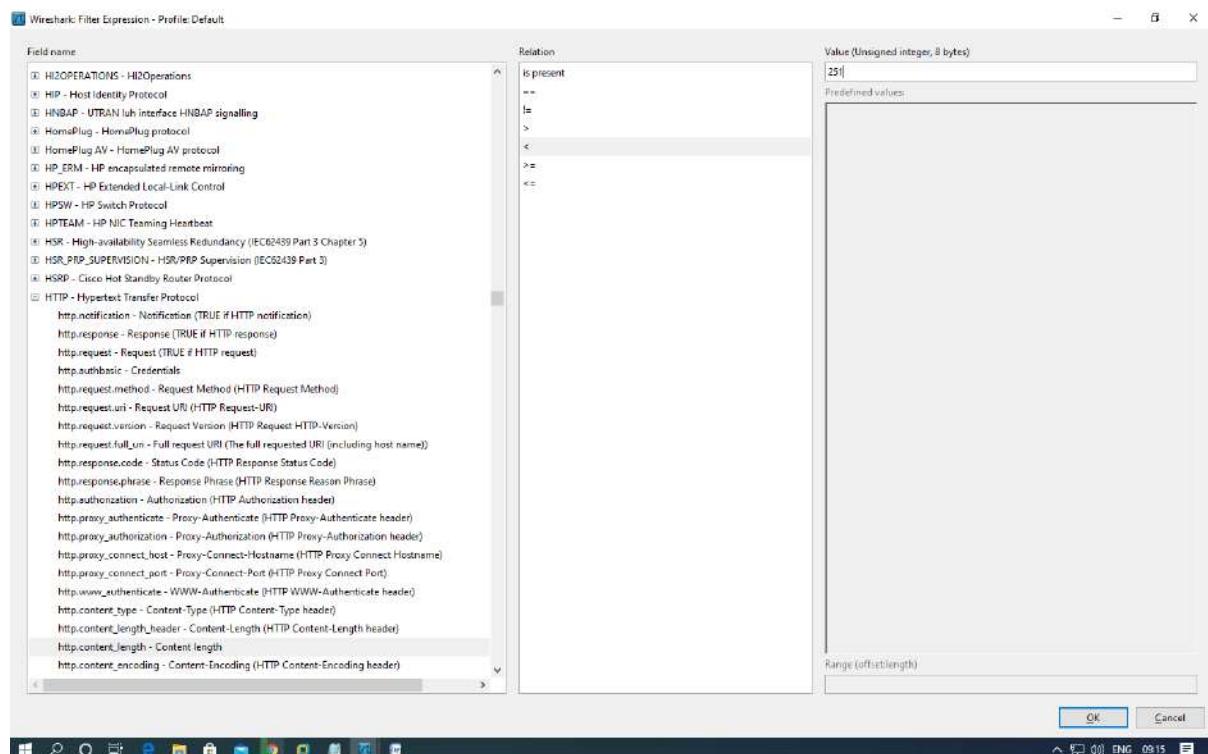
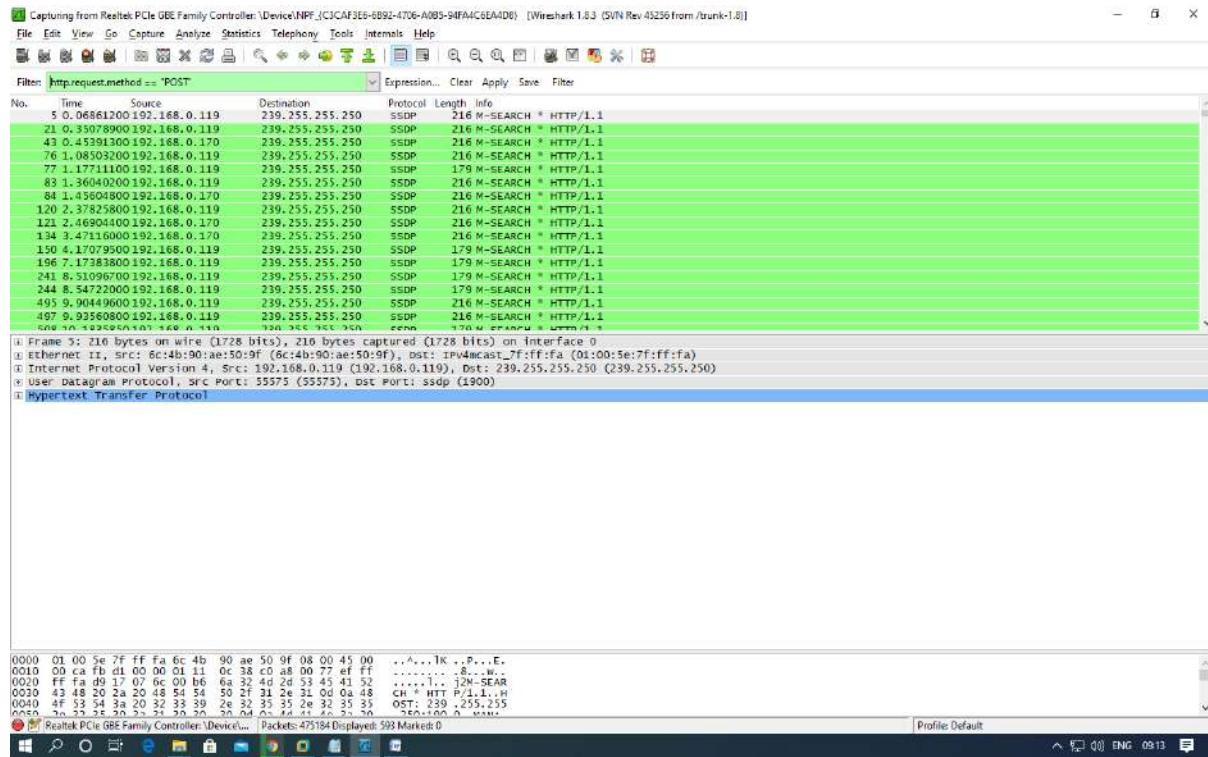


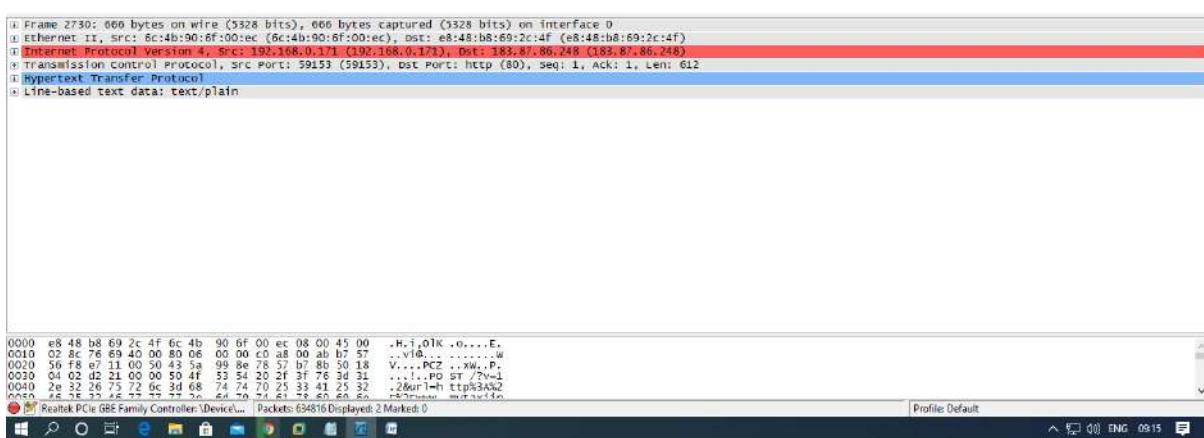
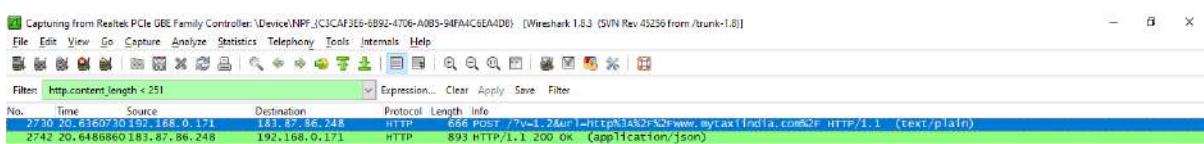
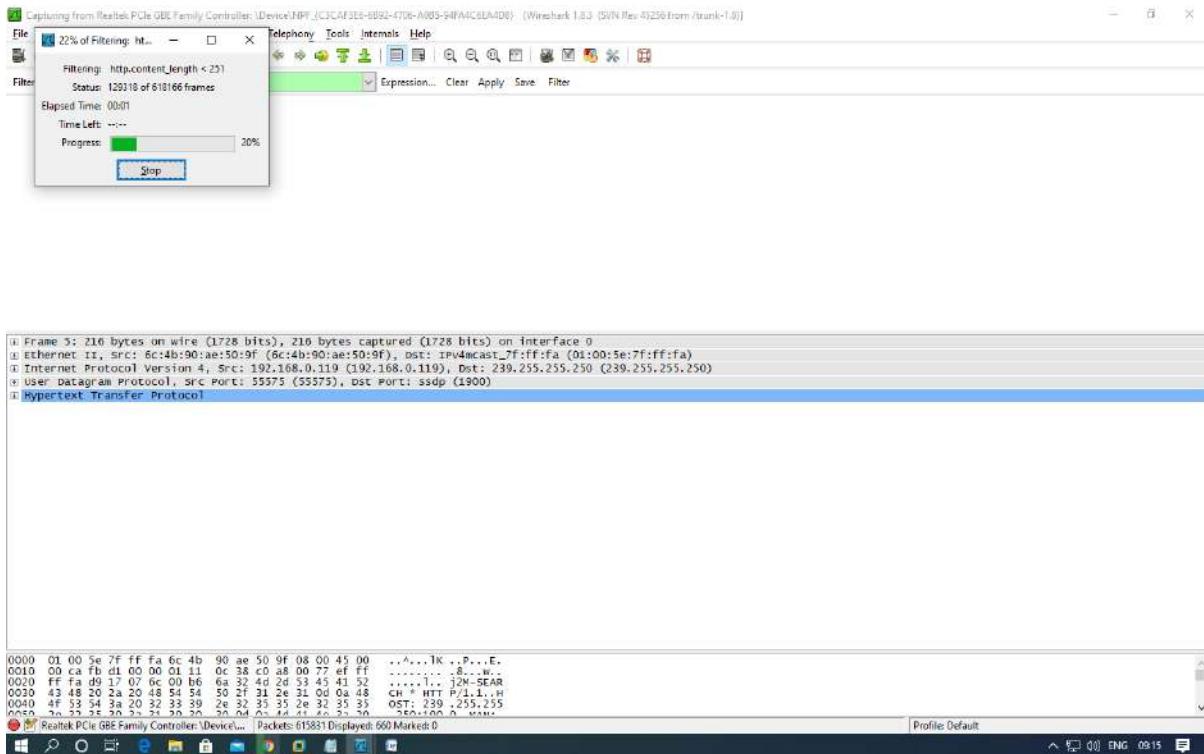
Click on Apply

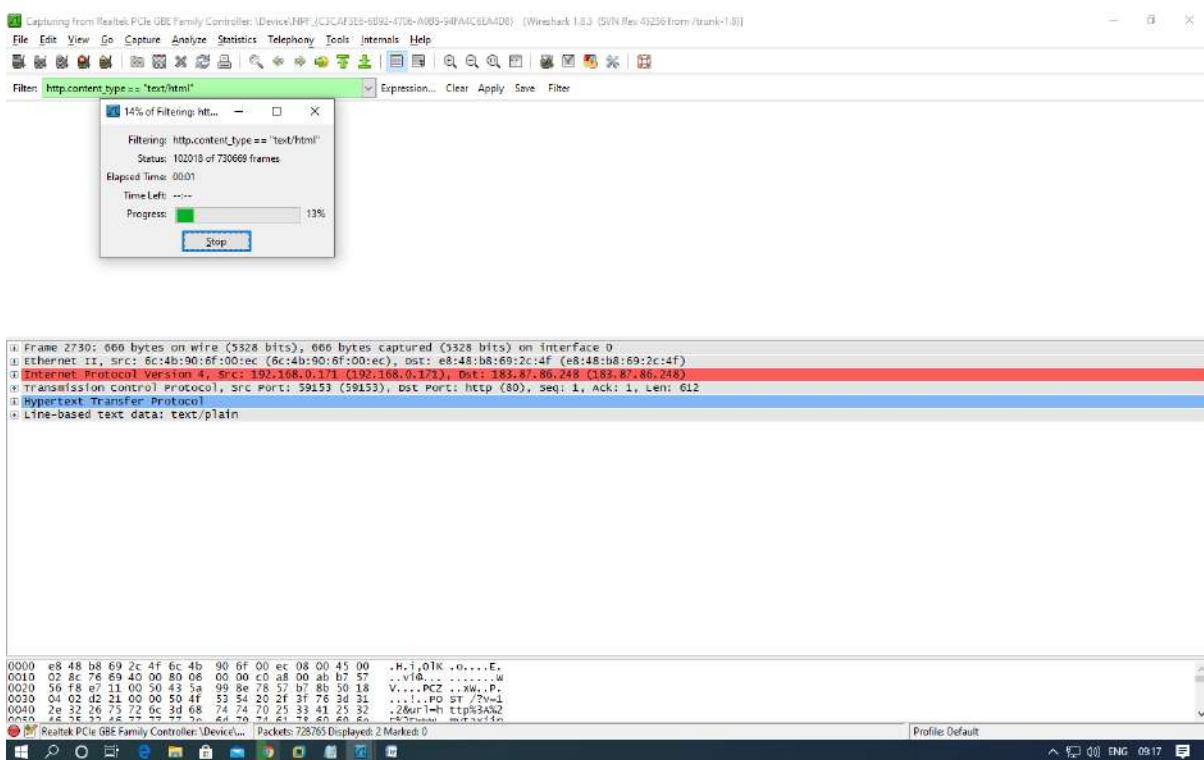
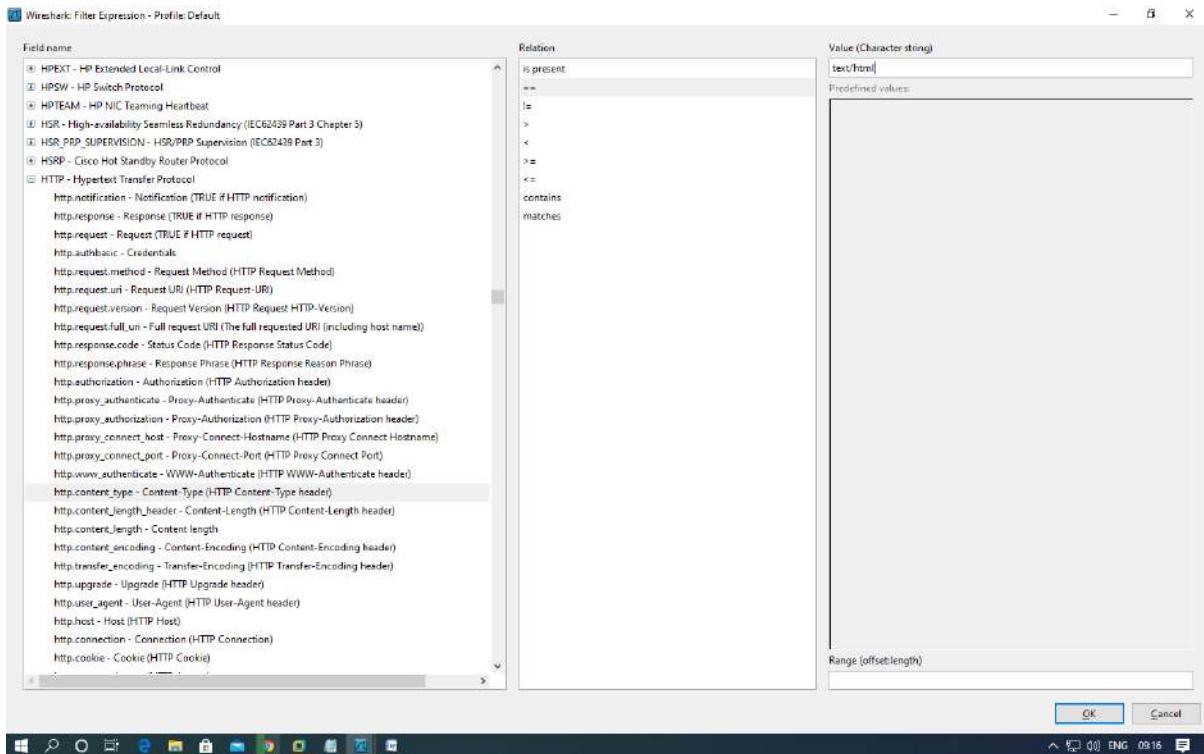


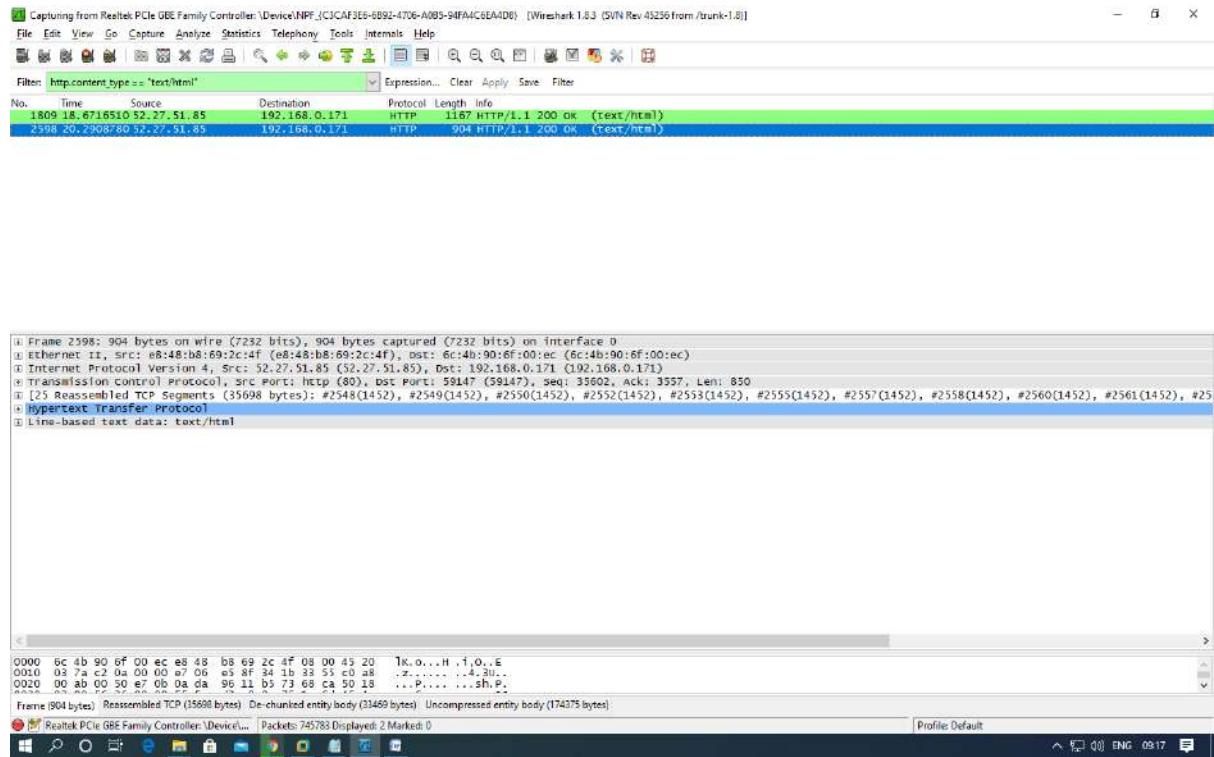












Practical No. 08

Aim: Using Email Forensics Tools [AccessData FTK].

What is Email Forensics?

Email forensics is **the study of source and content of email as evidence to identify the actual sender and recipient** of a message along with some other information such as date/time of transmission and intention of sender. It involves investigating metadata, port scanning as well as keyword searching.

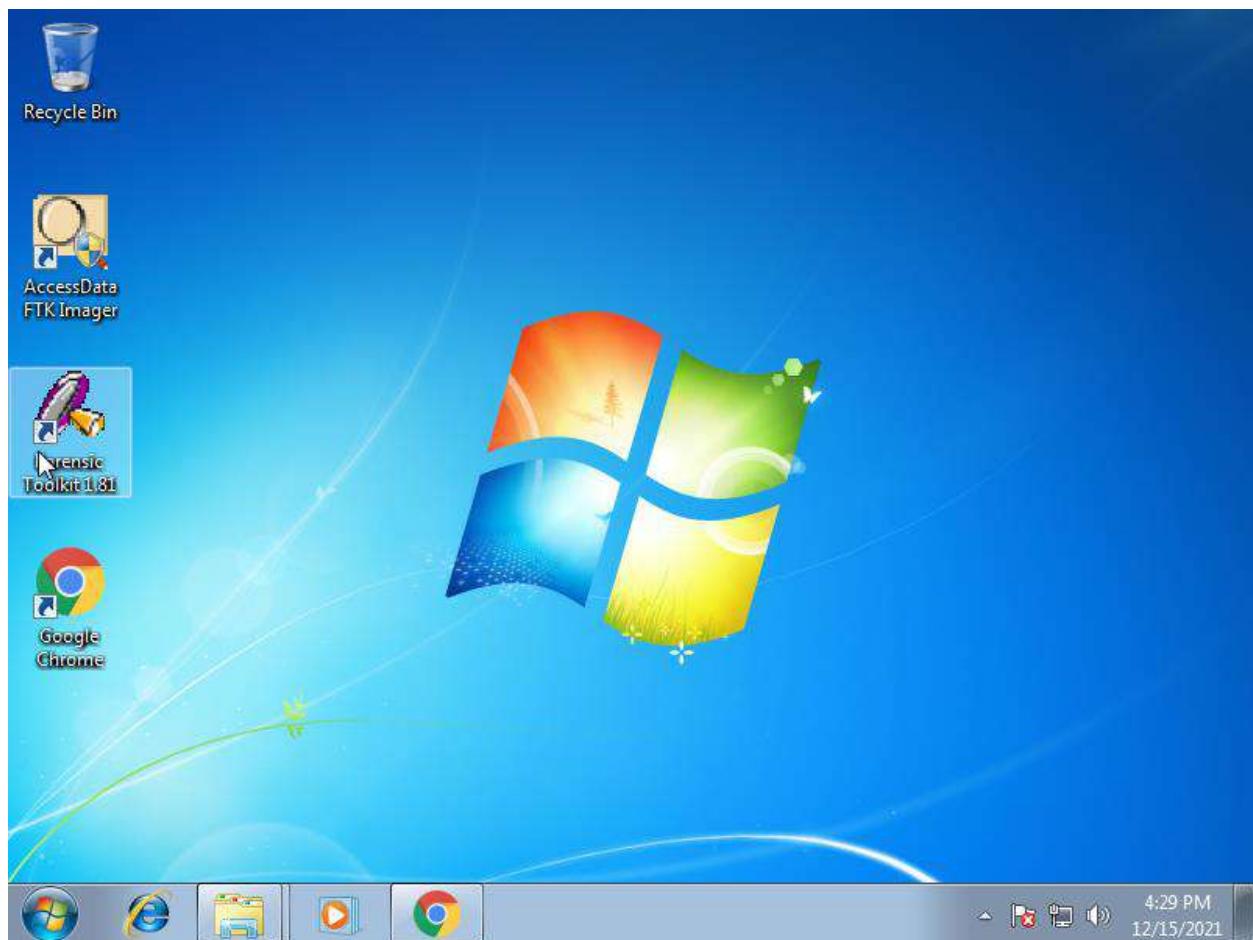
What is AccessData FTK Tool?

Forensic Toolkit, or FTK, is a computer forensics software made by AccessData. It **scans a hard drive looking for various information**. It can, for example, potentially locate deleted emails and scan a disk for text strings to use them as a password dictionary to crack encryption.

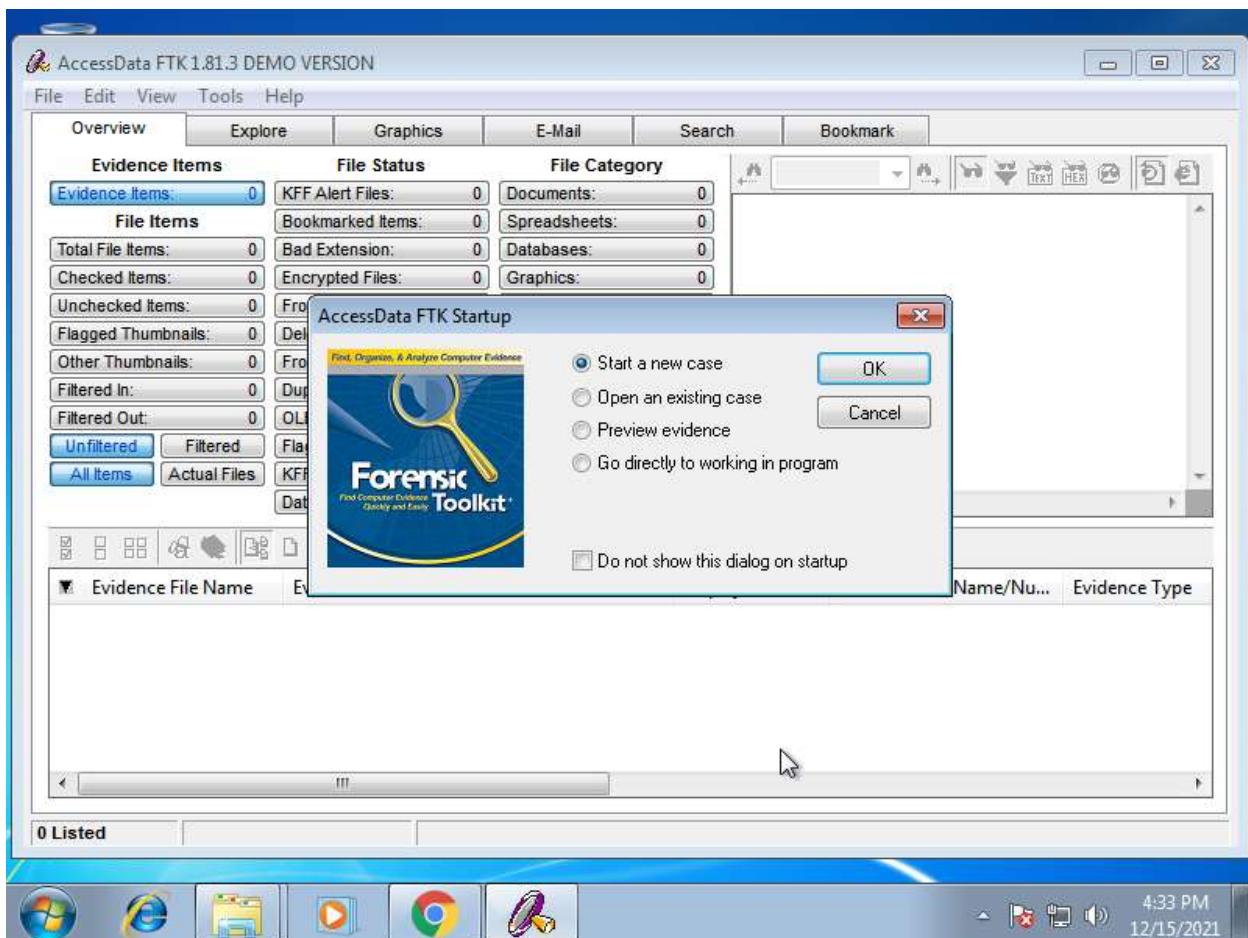
FTK provides an **intuitive interface for email analysis** for forensic professionals. This includes having the ability to parse emails for certain words, header analysis for source IP address, etc. A central feature of FTK, file decryption is arguably the most common use of the software.

Steps:

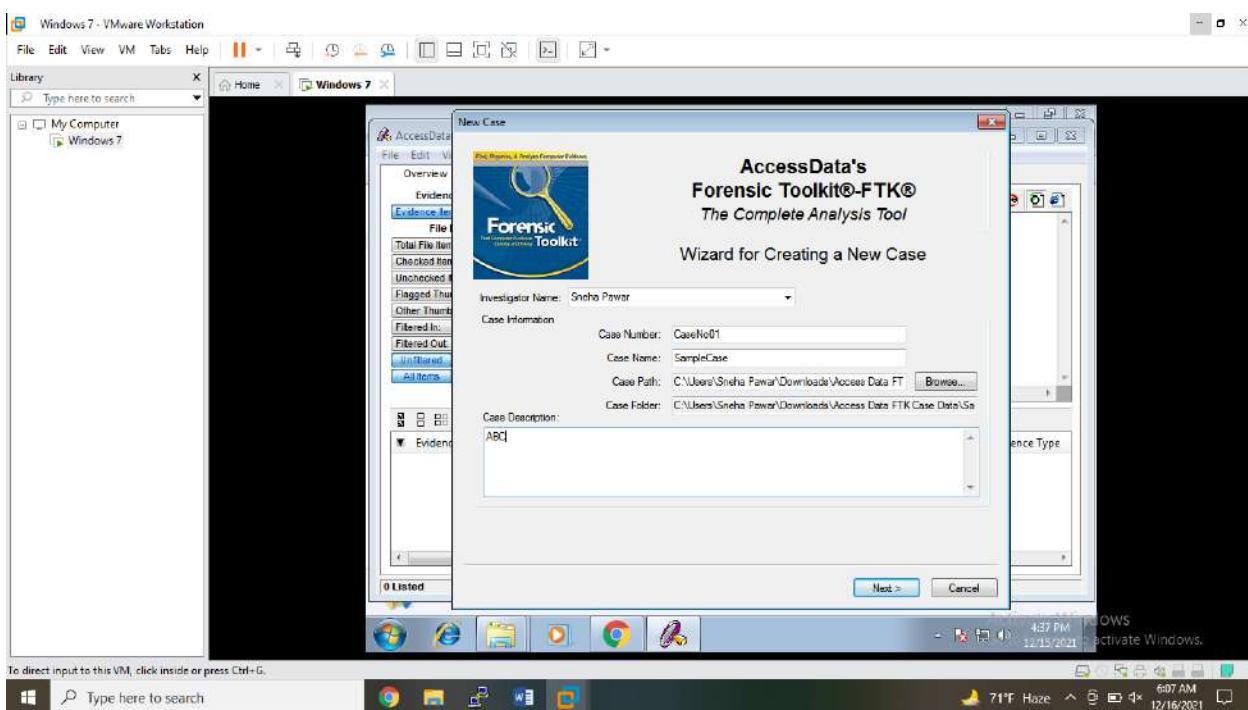
Start the forensic toolkit software.



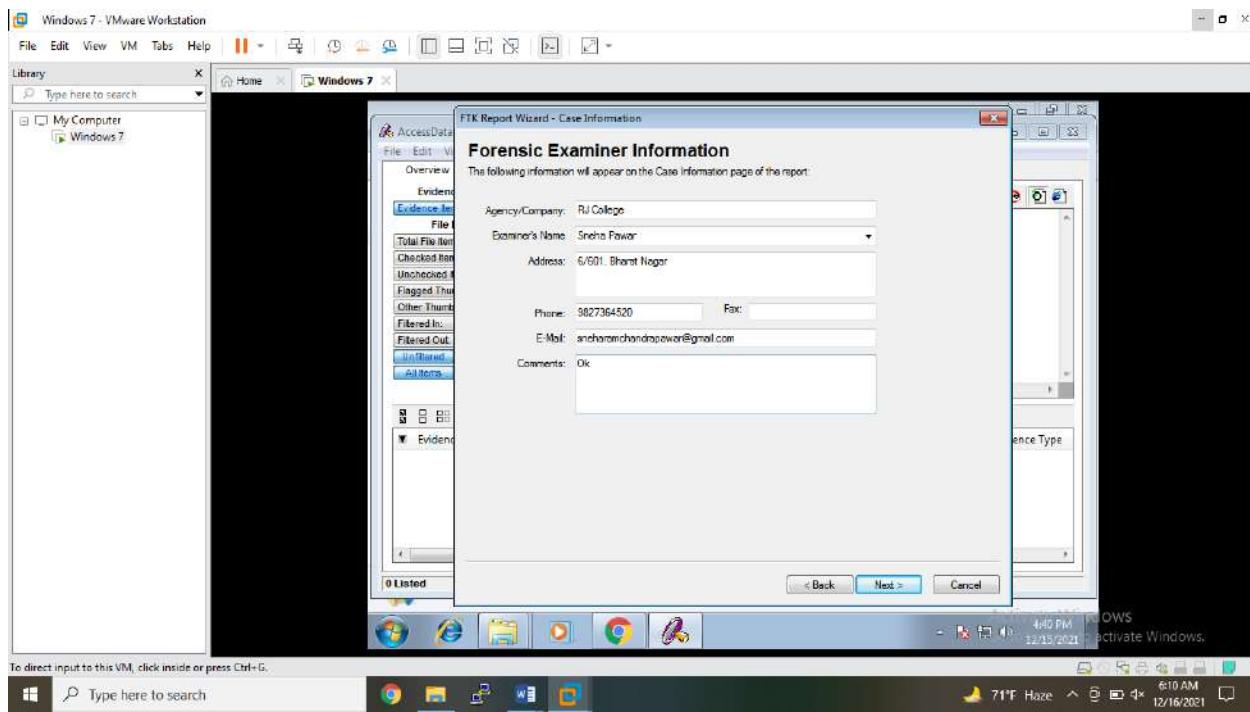
Select Start a New Case.



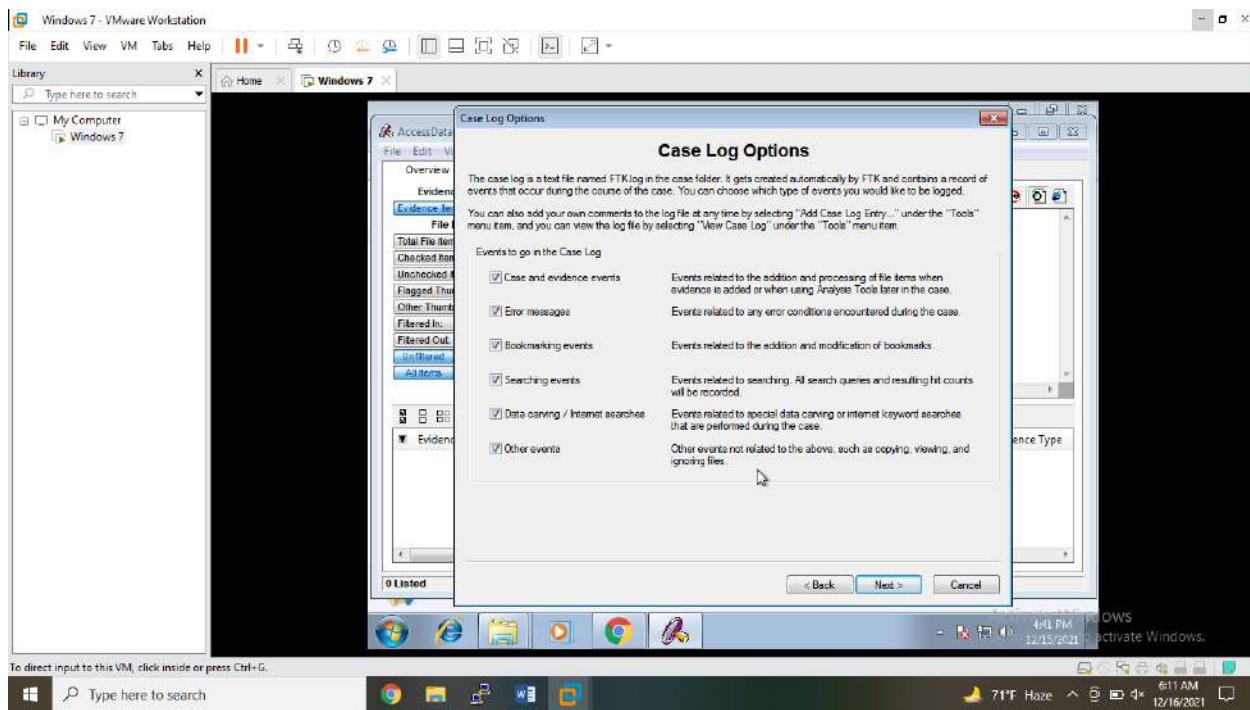
Then enter investigator's name and other details and click on Next.

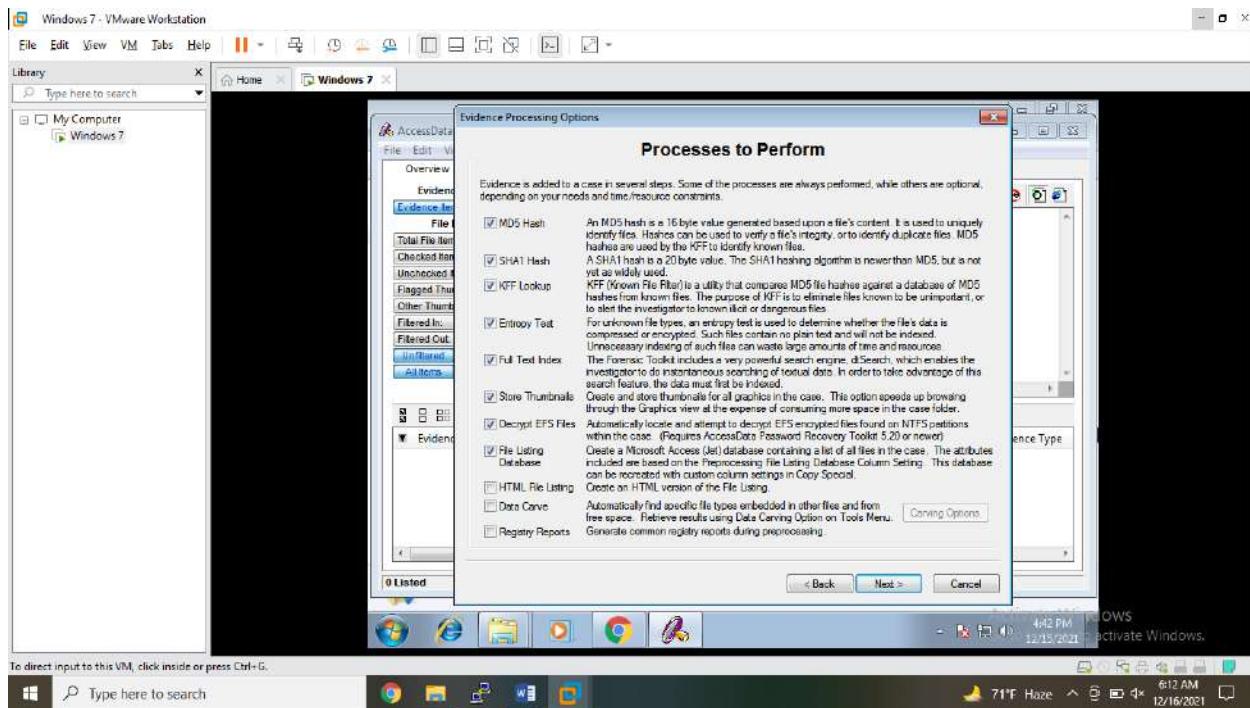


Then enter forensic examiner's details.

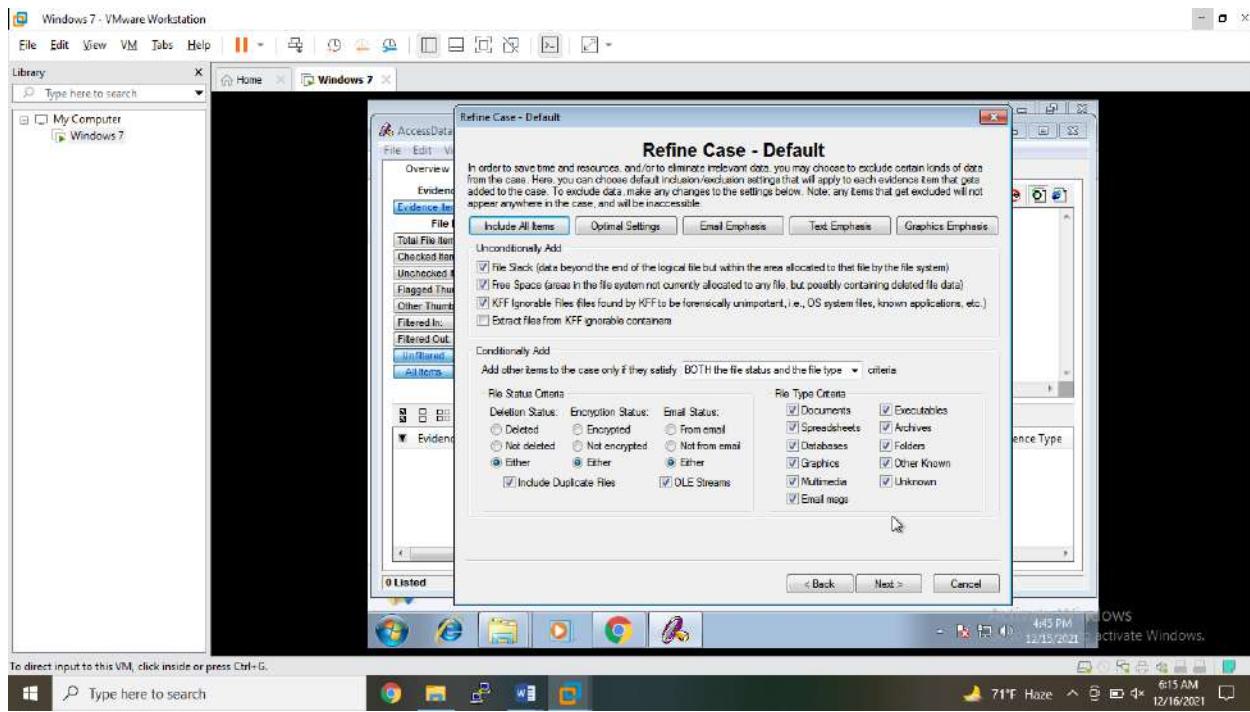


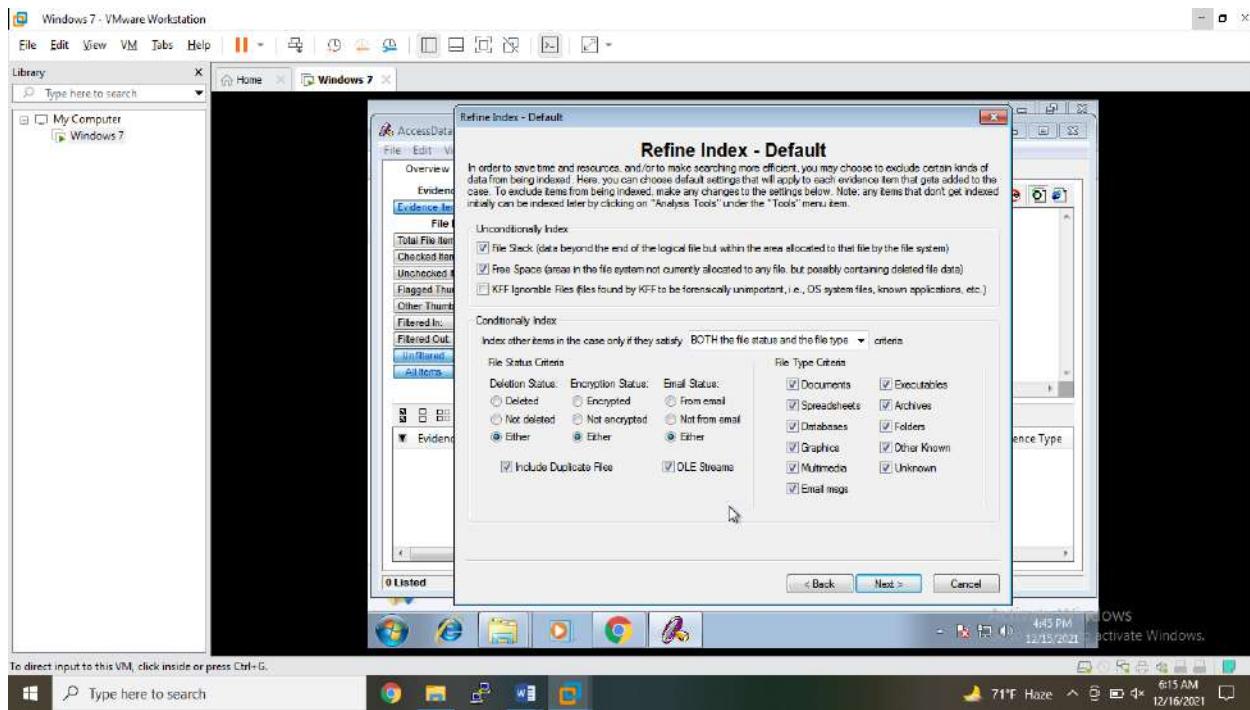
In Case Log Options & Process to perform tabs, keep everything by default.



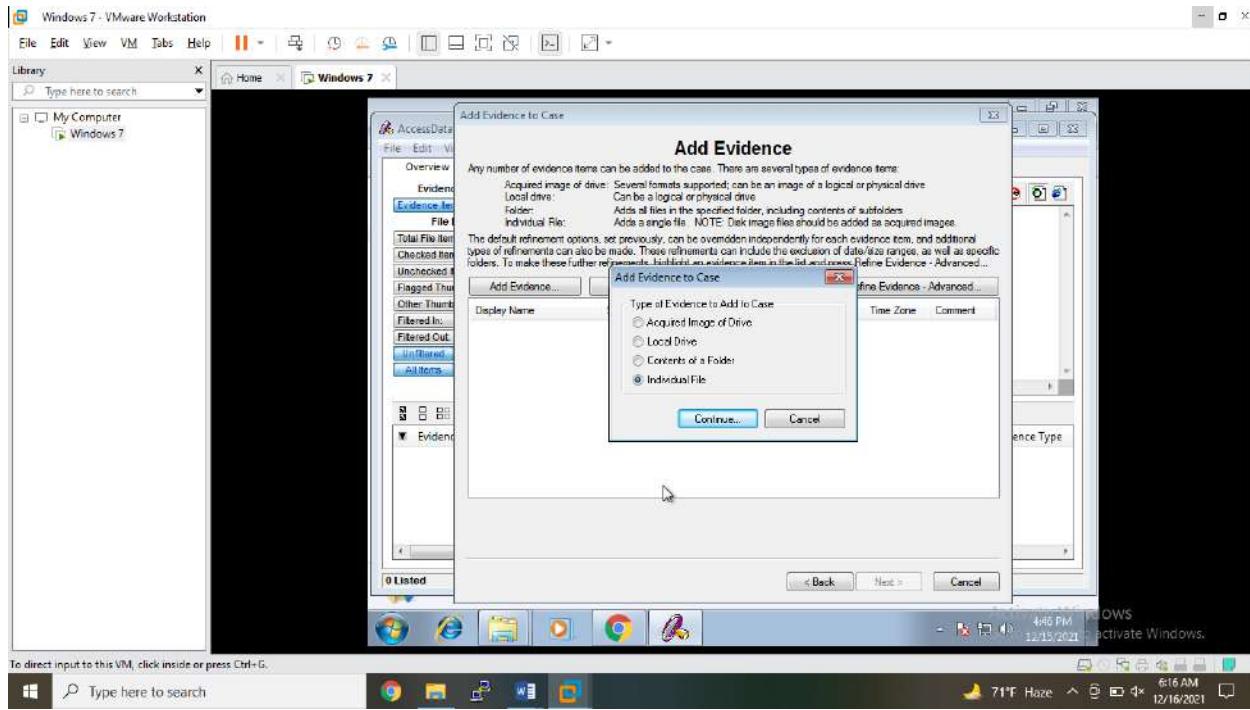


Then in Refine Case Default, Keep everything as it is, and click on Next.

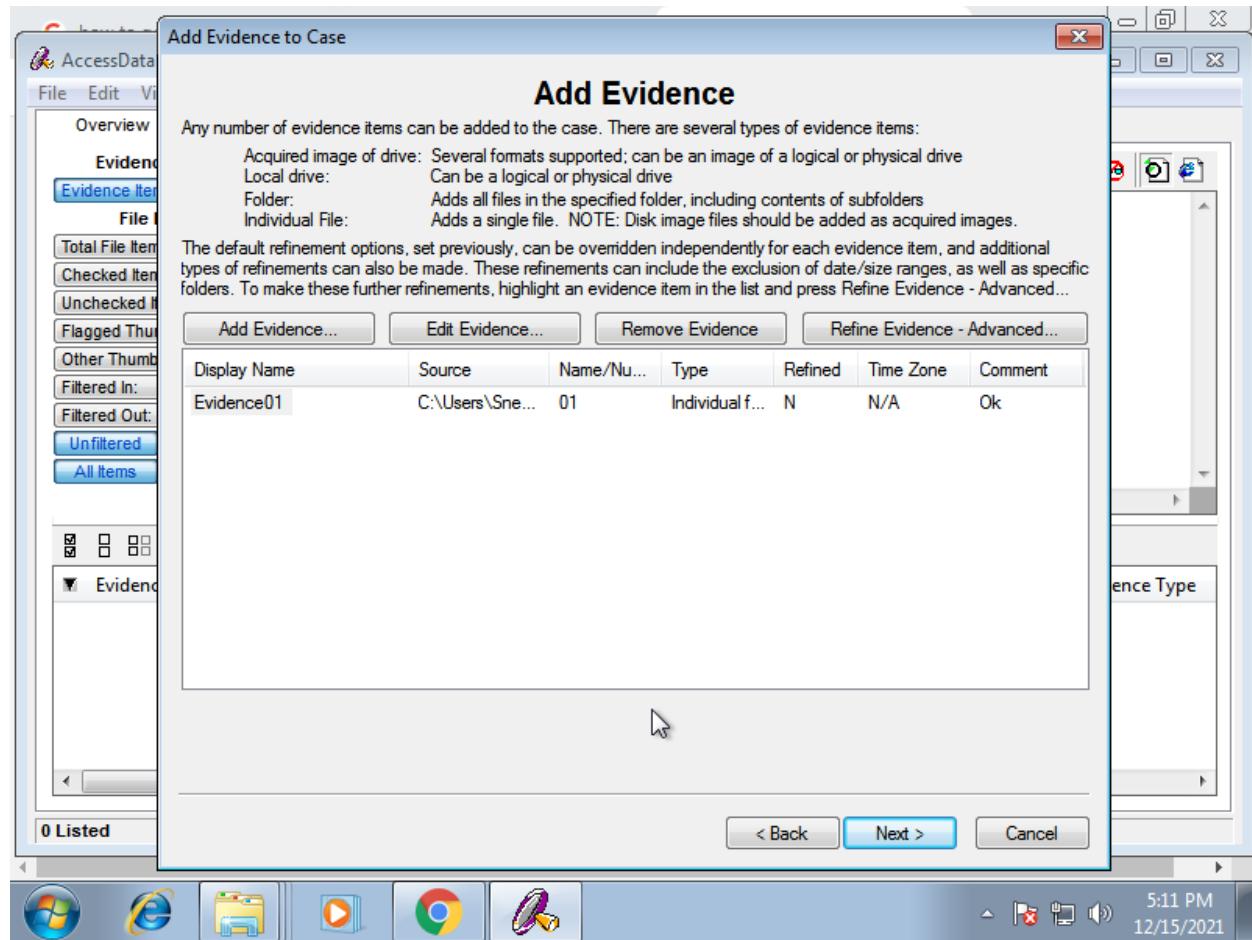
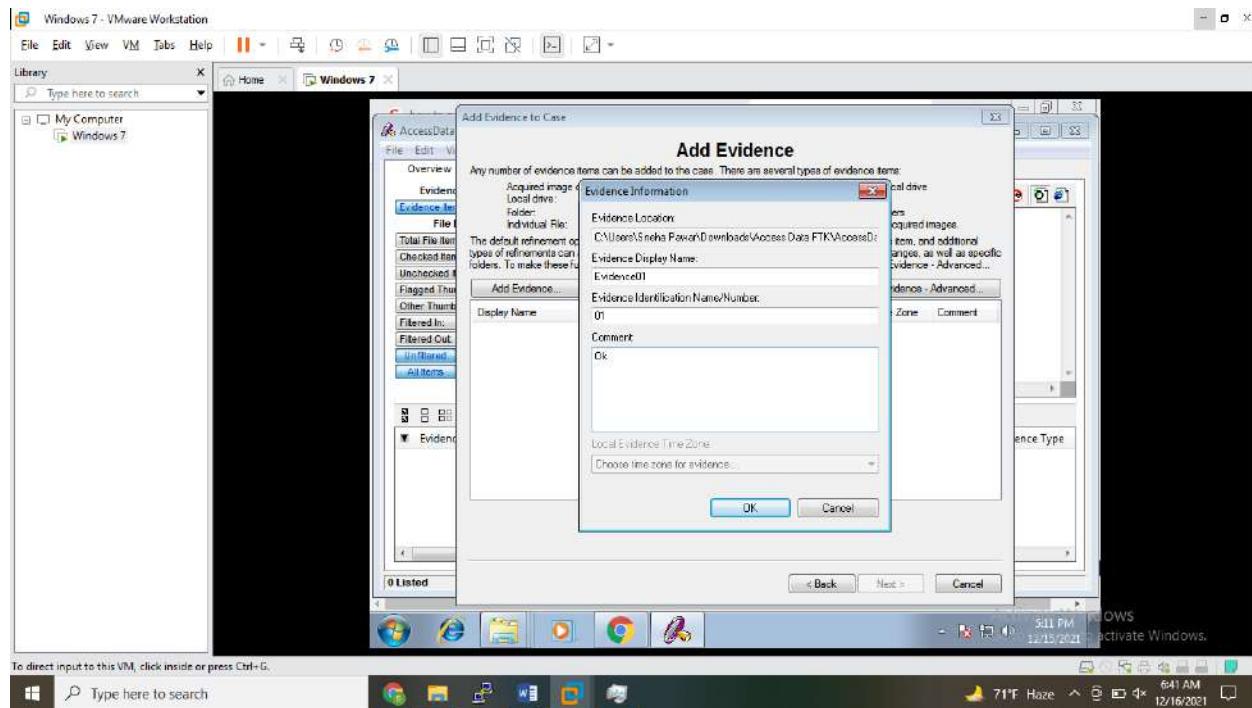


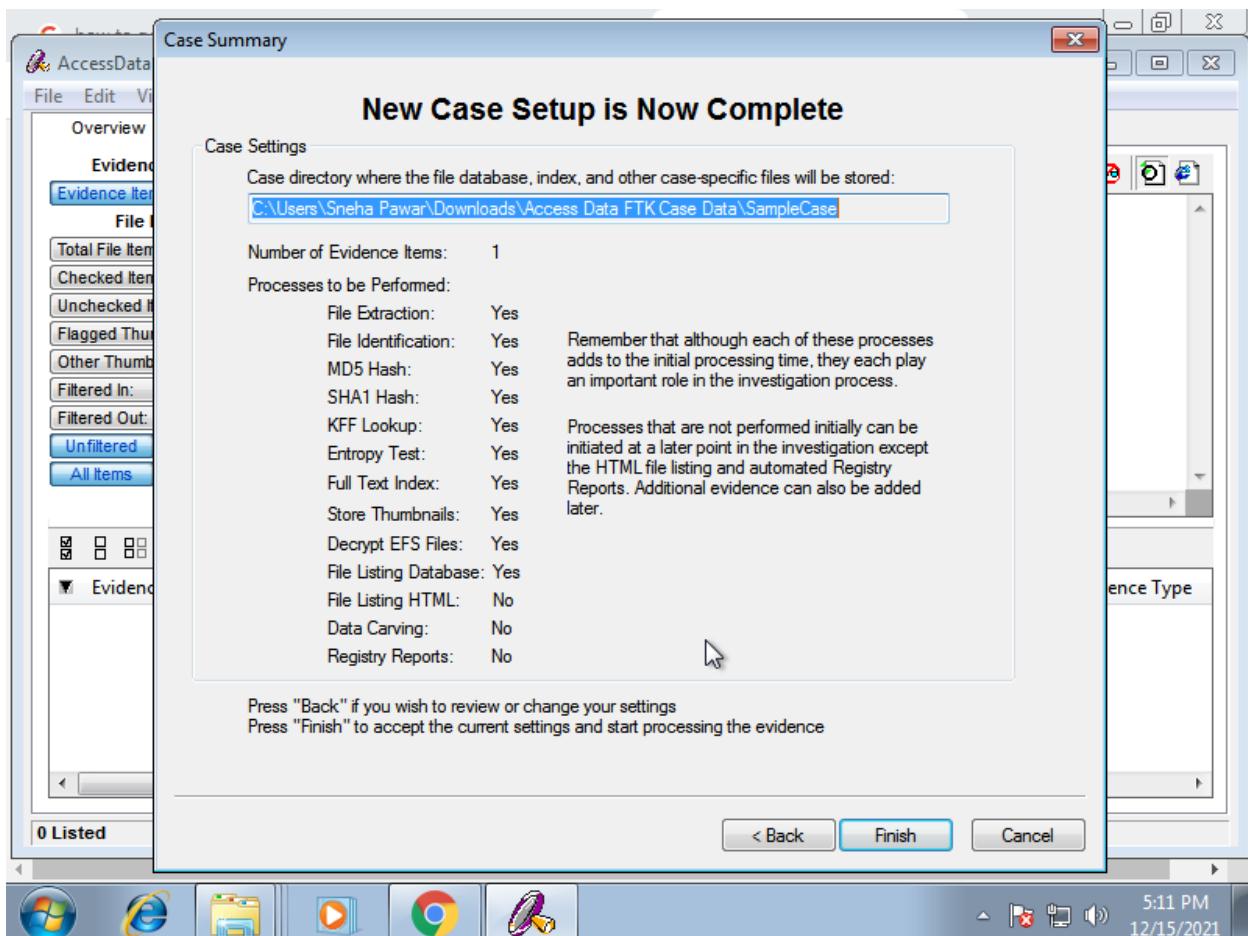


Then click on Add Evidence – Add Individual File.

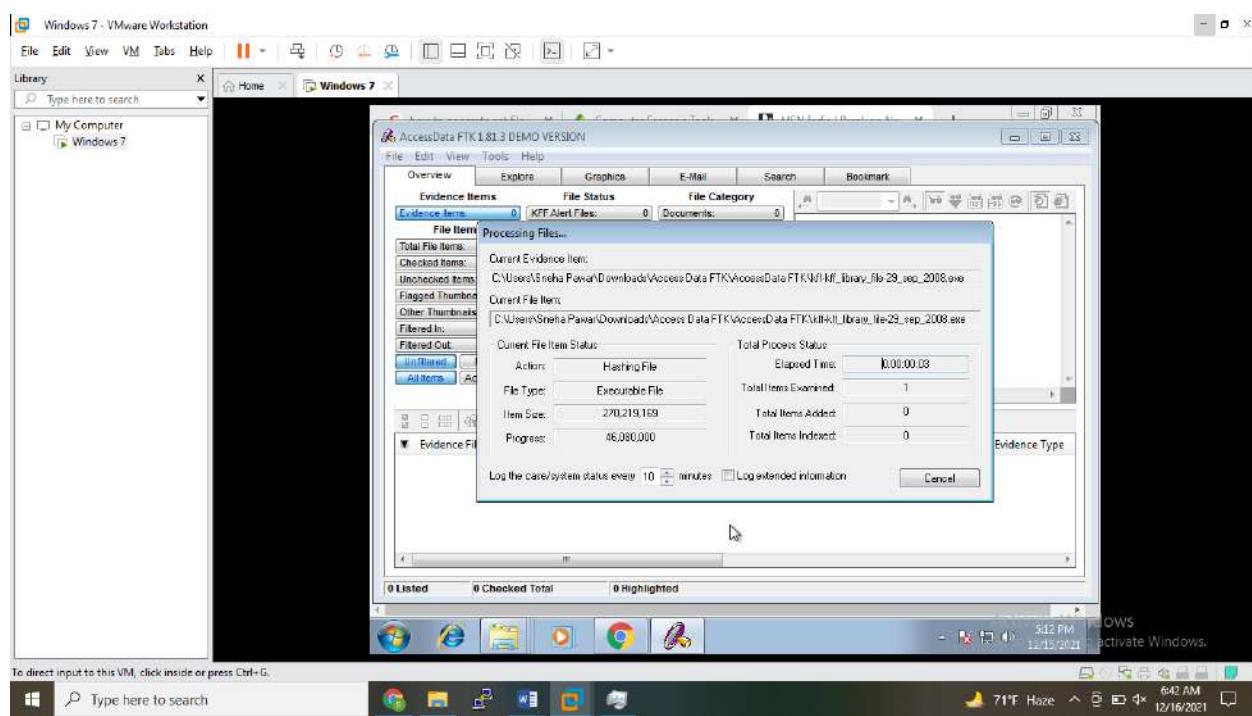


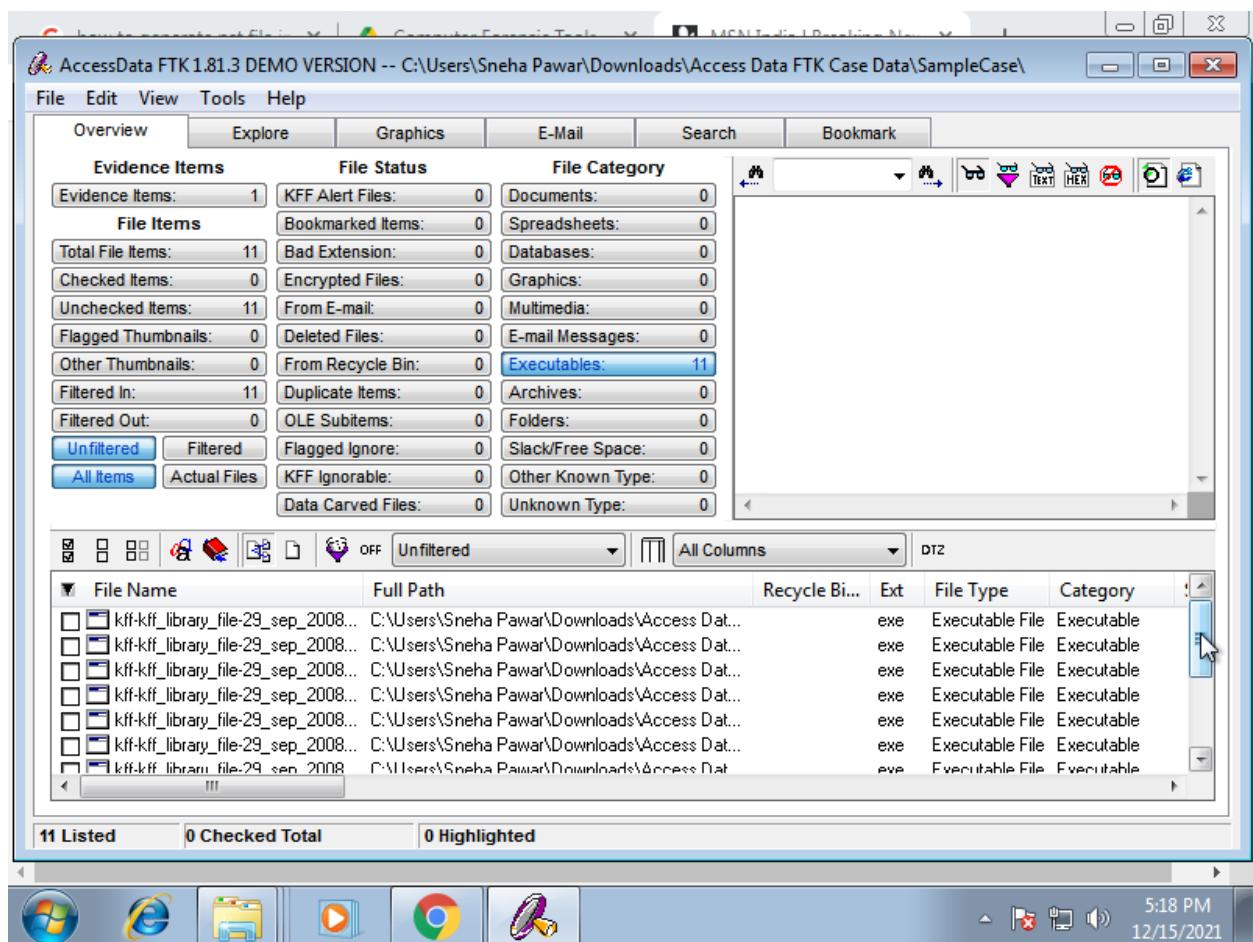
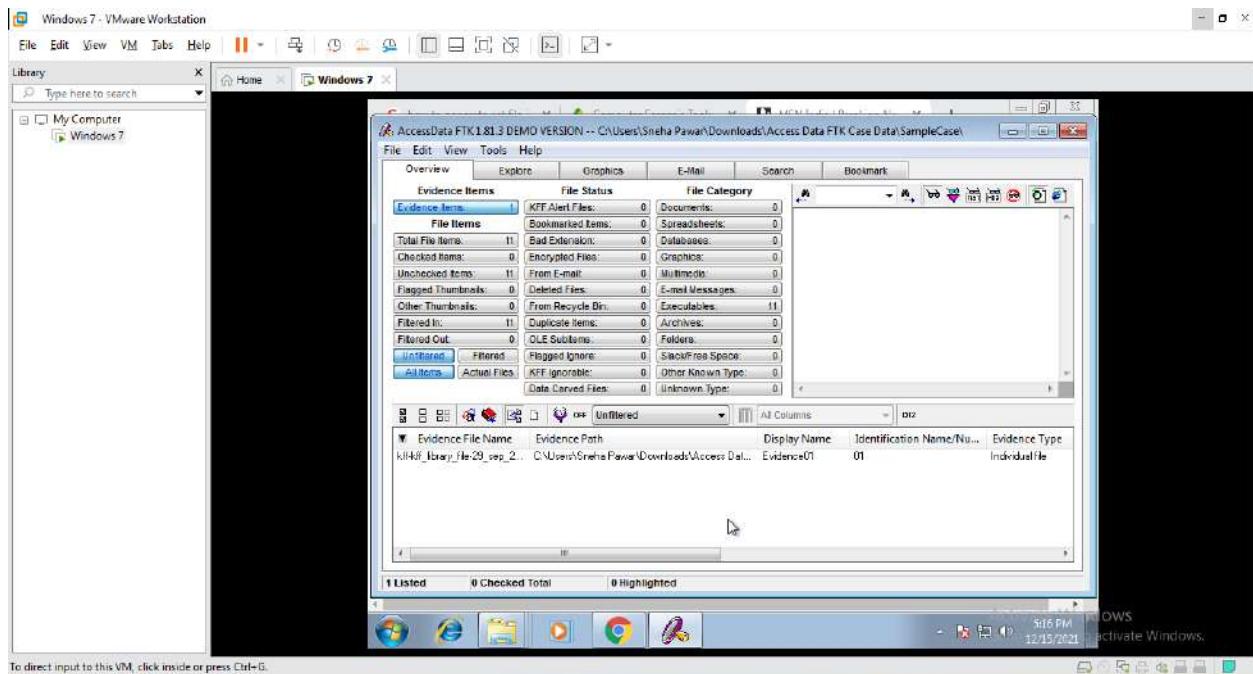
Then Browse for Evidence location, and enter other details.



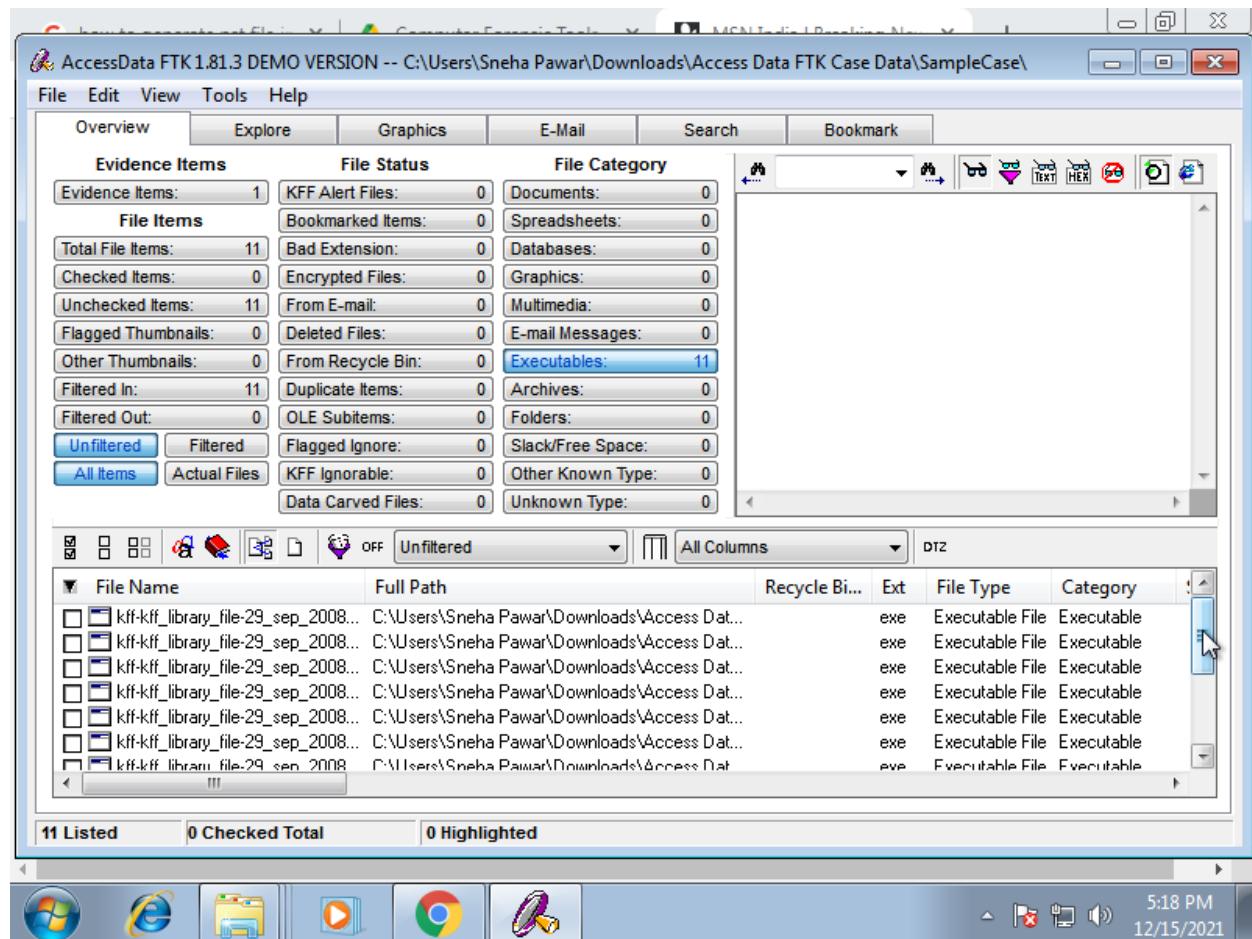


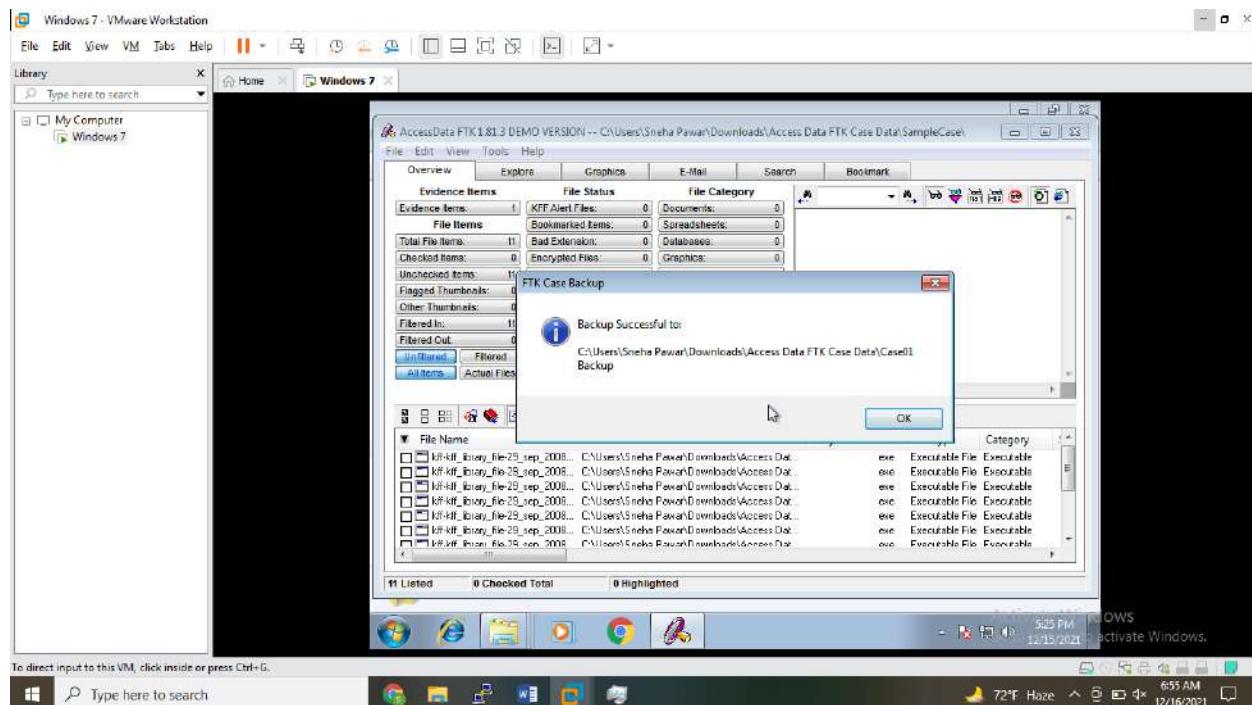
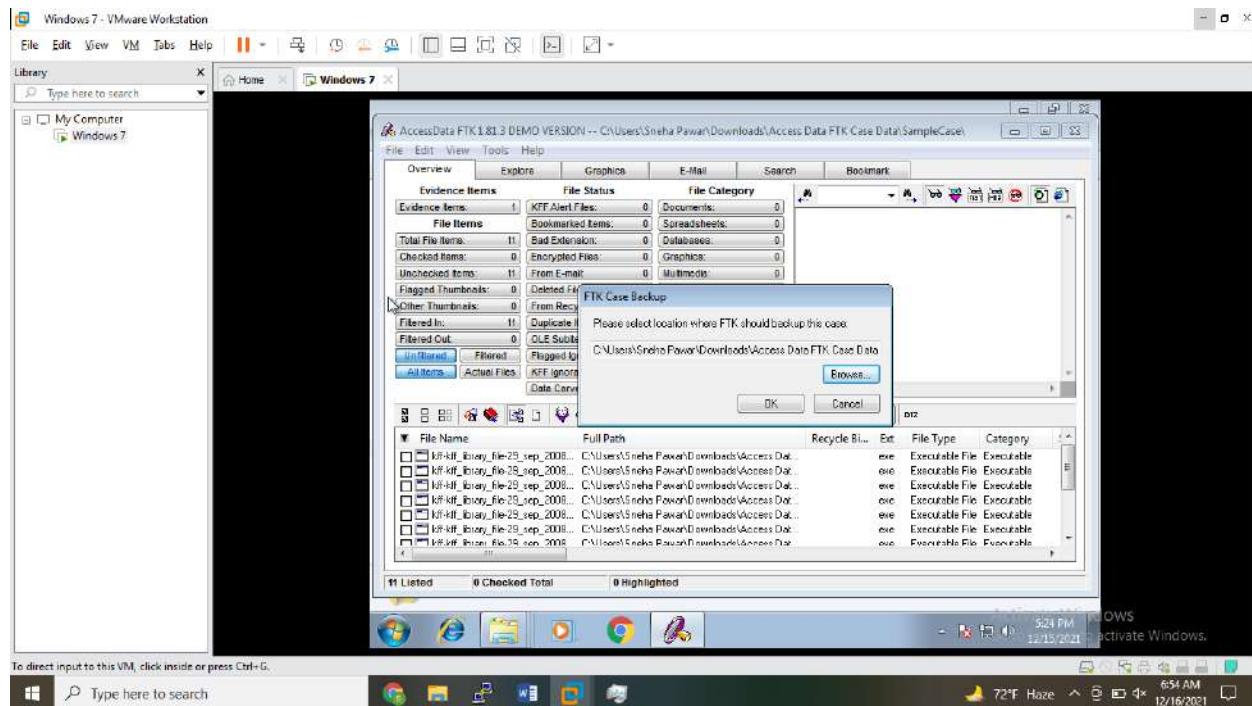
Click on Finish. It will start processing the File.





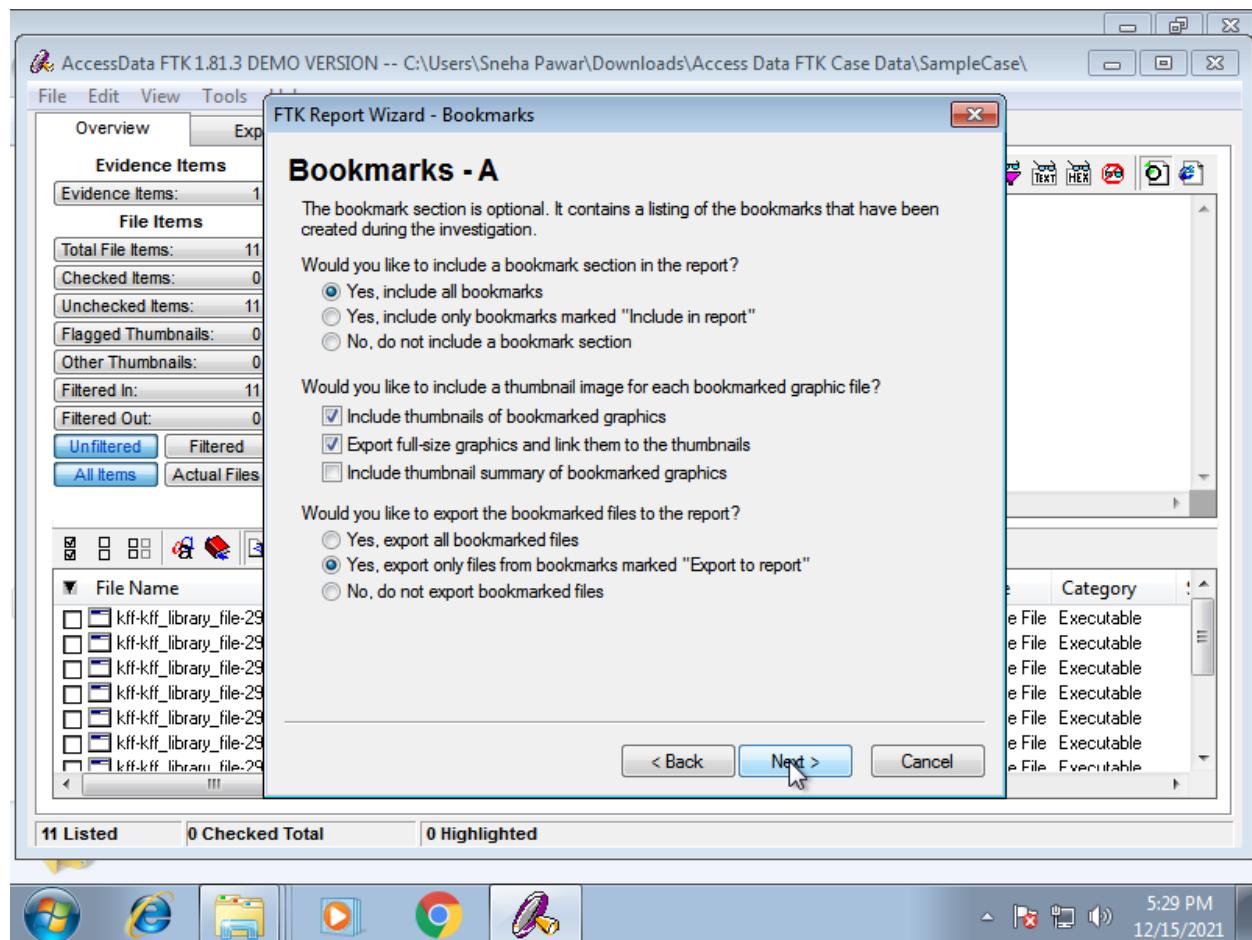
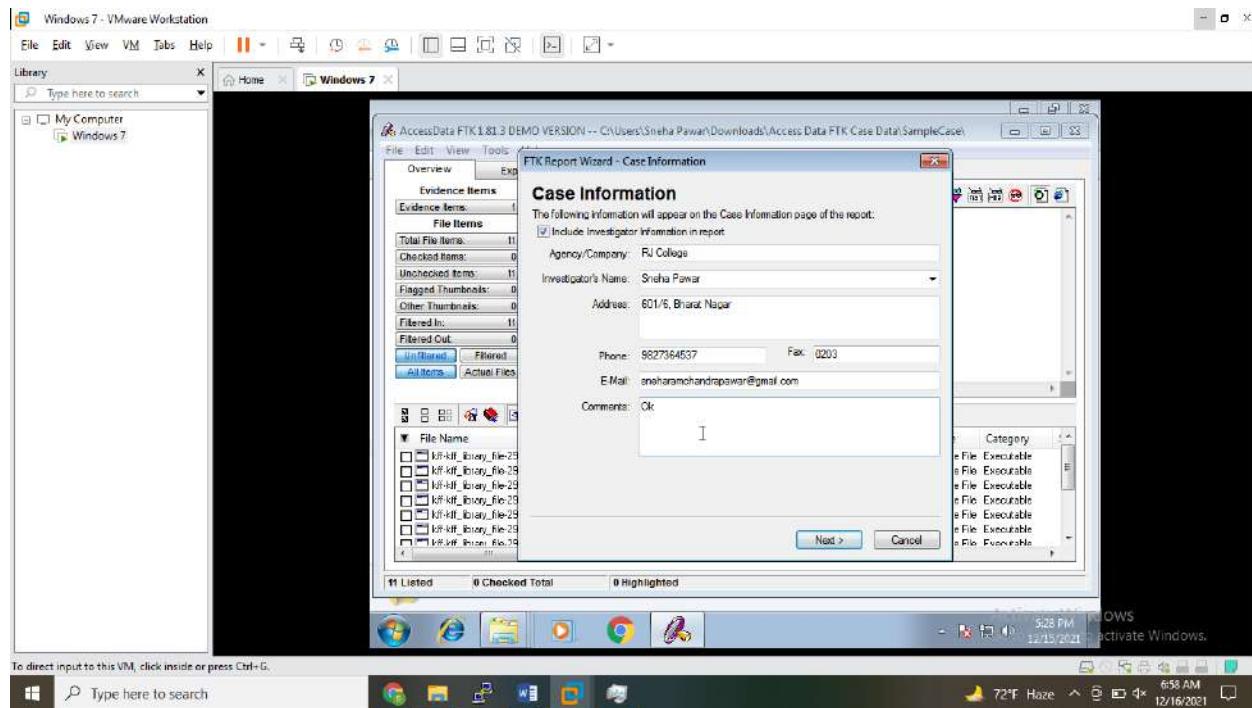
To take backup of your case, Click on File – Backup Case – And browse for location where you want to take backup.

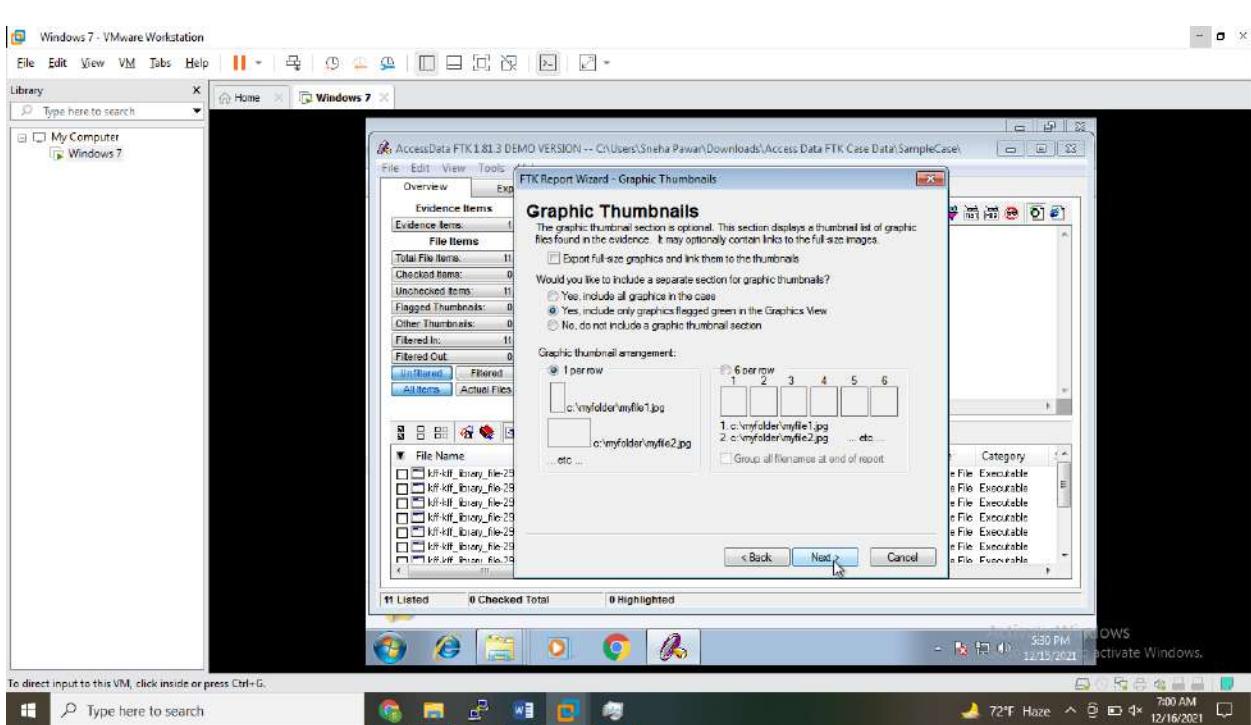
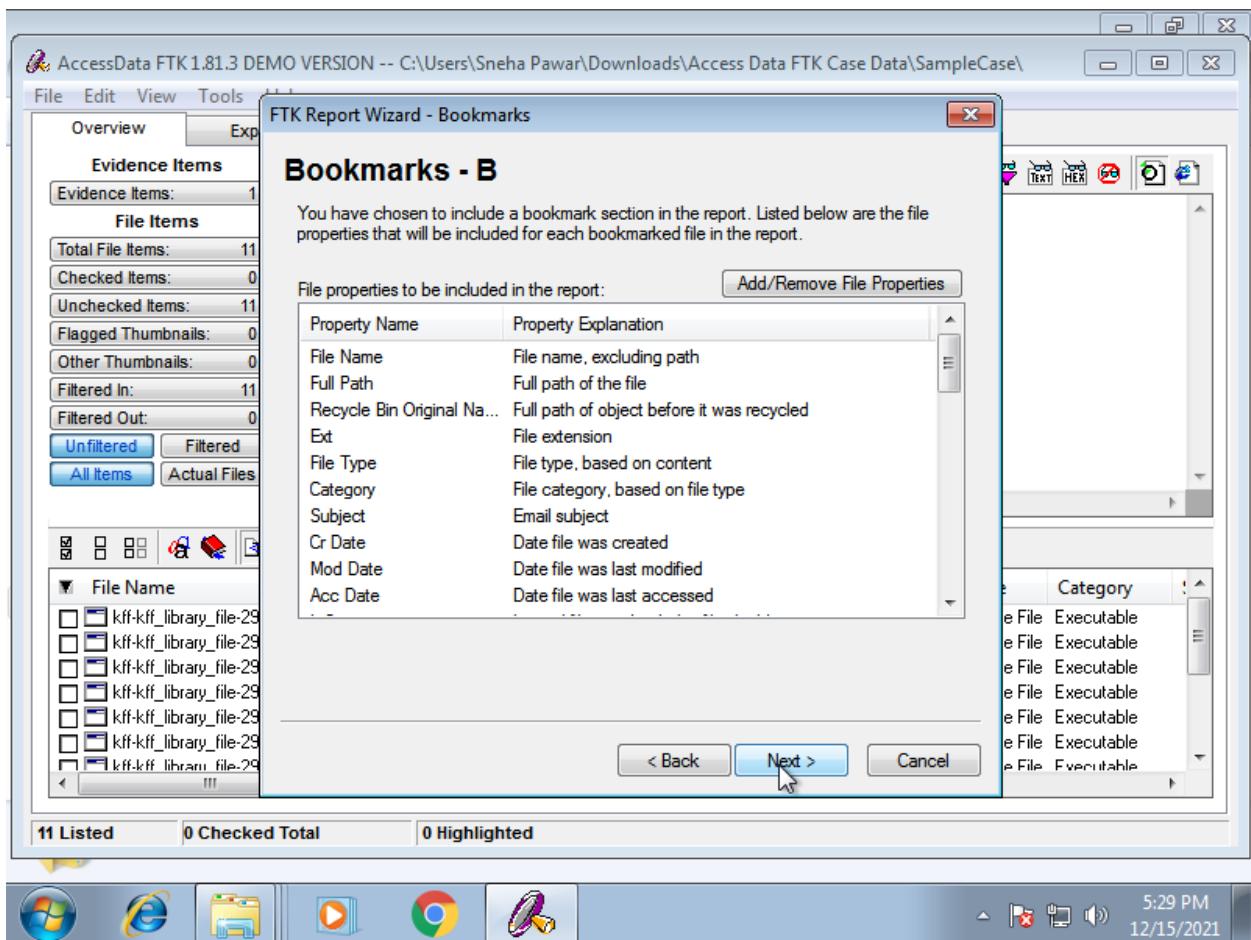




Then click on File - Report Wizard.

Fill the details. And click on Next.





AccessData FTK 1.81.3 DEMO VERSION -- C:\Users\Sneha Pawar\Downloads\Access Data FTK Case Data\SampleCase

File Edit View Tools

Evidence Items

Evidence Items: 1

File Items

Total File Items: 11
Checked Items: 0
Unchecked Items: 11
Flagged Thumbnails: 0
Other Thumbnails: 0
Filtered In: 11
Filtered Out: 0
Unfiltered Filtered
All Items Actual Files

File Name

- kff-kff_library_file-29

11 Listed 0 Checked Total 0 Highlighted

FTK ReportWizard - List by File Path

List by File Path

The list by file path section is optional. This section contains tree listings, by path, of files in a given category. These lists show just the file layout; they contain no other file properties.

Include a list by file path section in the report

Categories of lists that can be included:

List Category	Include	Export
All Items	no	no
KFF Alert Files	no	no
Bad Extension	no	no
Encrypted Files	no	no
Emailed Items	no	no
Deleted Files	no	no
Recycled Files	no	no
Duplicate Items	no	no
Flagged Ignore	no	no
KFF Ignorable	no	no

To add or remove a list category from the report, select the category and then change the settings below.

Selected Category Settings:

- Include in the report
- Export to the report
- Apply a file filter to the list

Filter name:

Example: C:
 - myfolder
 - myfile1.jpg
 - mysubfolder
 - myfile2.jpg

< Back Next > Cancel



5:30 PM
12/15/2021

AccessData FTK 1.81.3 DEMO VERSION -- C:\Users\Sneha Pawar\Downloads\Access Data FTK Case Data\SampleCase

File Edit View Tools

Evidence Items

Evidence Items: 1

File Items

Total File Items: 11
Checked Items: 0
Unchecked Items: 11
Flagged Thumbnails: 0
Other Thumbnails: 0
Filtered In: 11
Filtered Out: 0
Unfiltered Filtered
All Items Actual Files

Include a list file properties section in the report
 Include MS Access database in report

Categories of lists to be included in the report:

List Category	Include	Export
All Items	no	no
KFF Alert Files	no	no
Bad Extension	no	no
Encrypted Files	no	no
Emailed Items	no	no
Deleted Files	no	no
Recycled Files	no	no
Duplicate Items	no	no
Flagged Ignore	no	no
KFF Ignorable	no	no

To add or remove a list category from the report, select the category and then change its settings below.

Selected Category Settings:

- Include in the report
- Export to the report
- Apply a file filter to the list

Filter name:

Example:

```
File: myfile1.jpg
Path: C:\myfolder
File Type: JPEG/JFIF File
Category: Graphic
L-Size: 37942
```

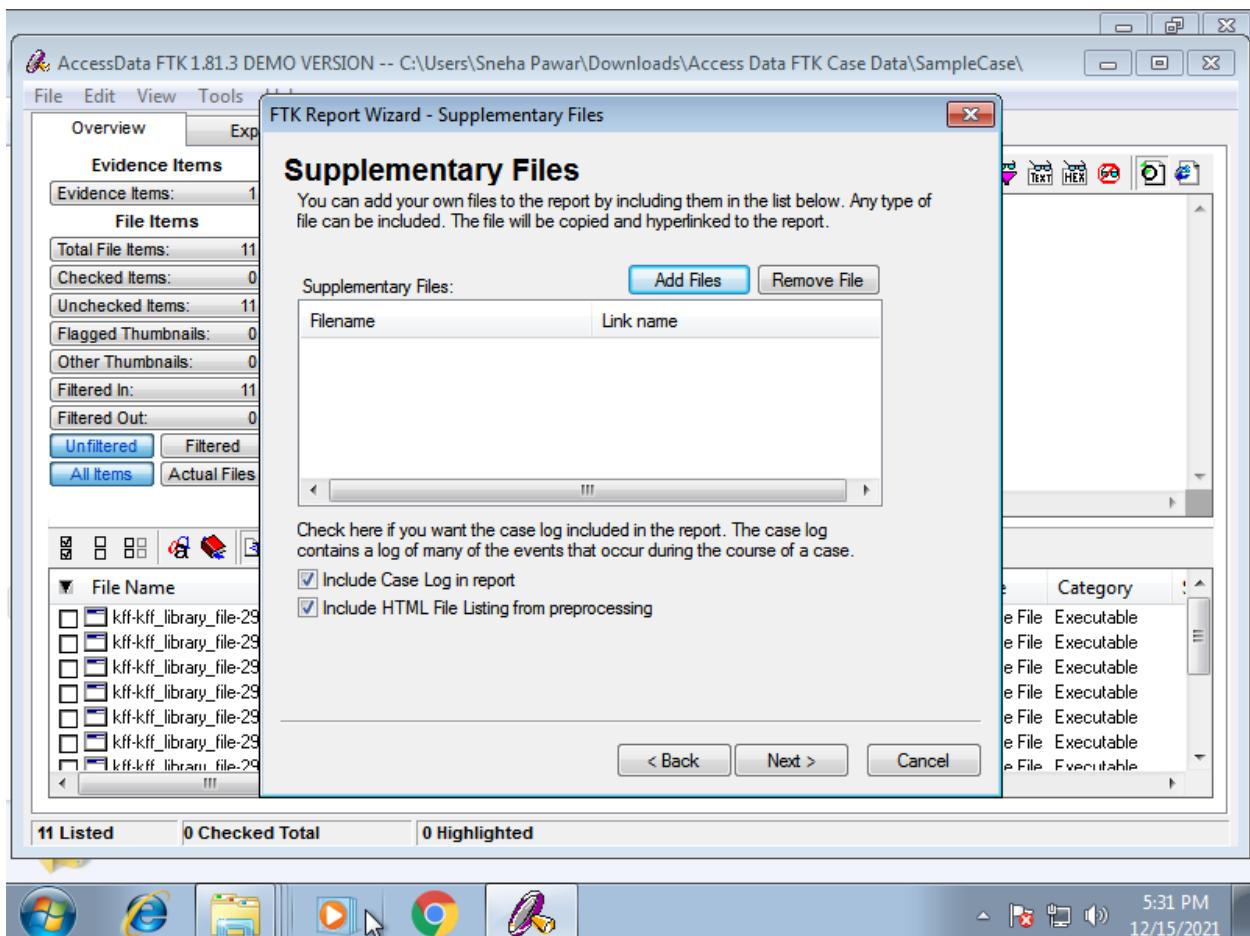
< Back Next > Cancel

11 Listed 0 Checked Total 0 Highlighted

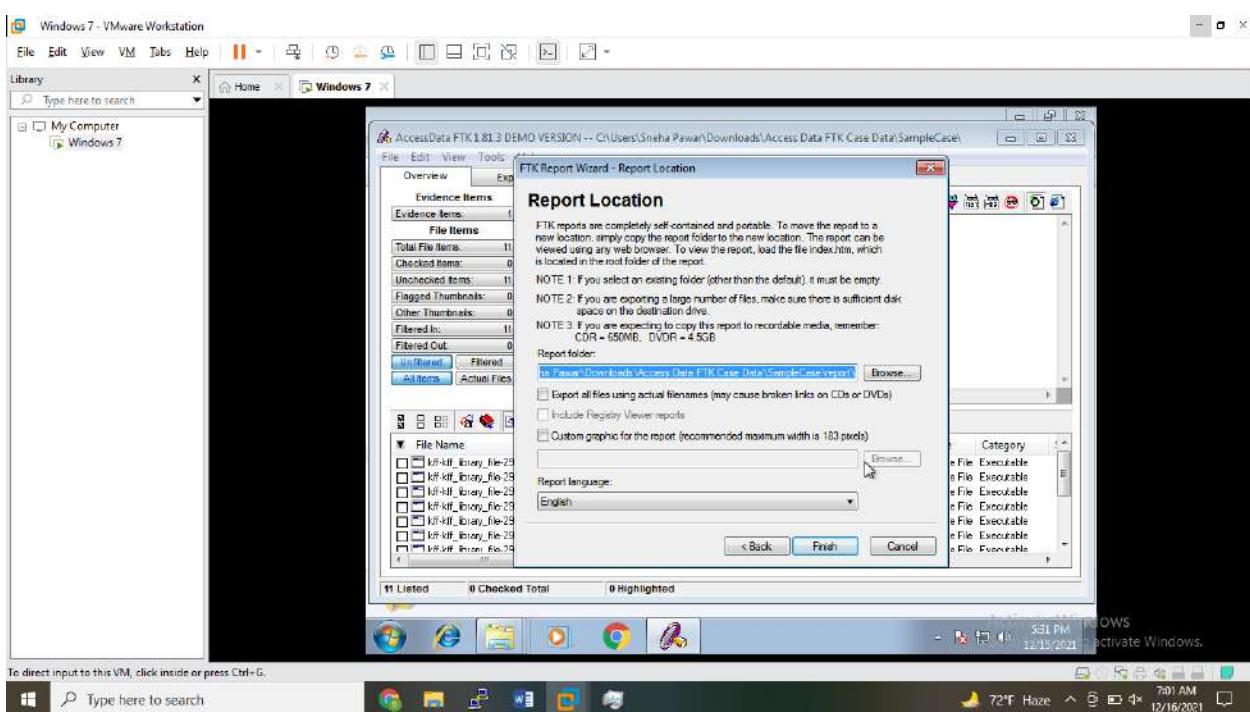
Category

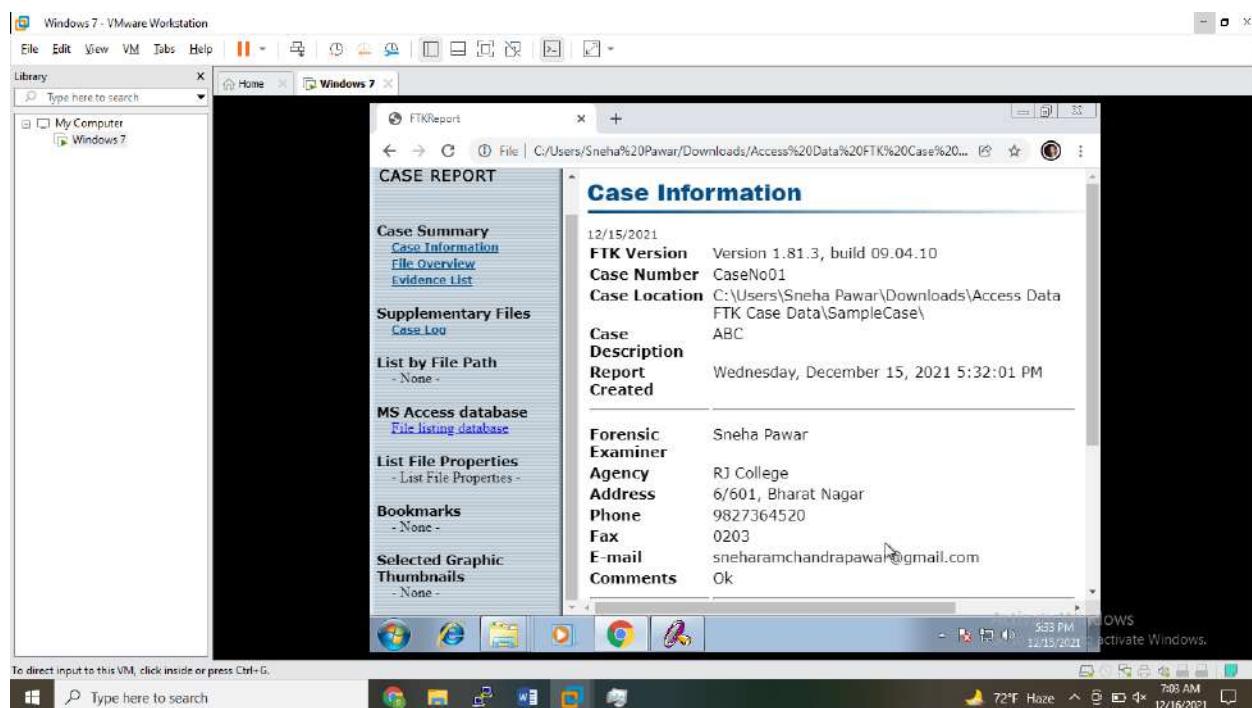
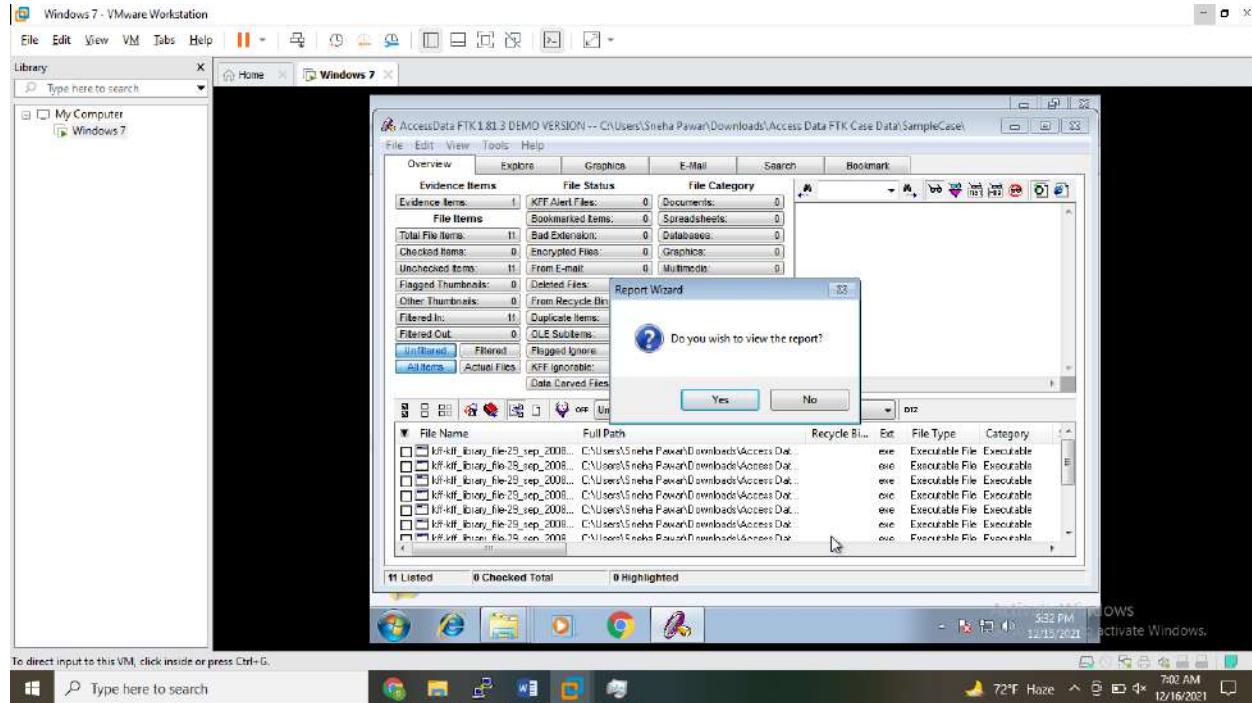
File Executable
File Executable
File Executable
File Executable
File Executable
File Executable
File Executable

5:30 PM
12/15/2021



Enter report location.





FTKReport

File | C:/Users/Sneha%20Pawar/Downloads/Access%20Data%20FTK%20Case%20...

CASE REPORT

Evidence List

12/15/2021

Display Name: Evidence01

Evidence File Name: kff-kff_library_file-29_sep_2008.exe

Evidence Path: C:\Users\Sneha Pawar\Downloads\Access Data FTK\AccessData FTK

Identification Name/Number: 01

Evidence Type: Individual file

Added: 12/15/2021 5:12:15 PM

Children: 0

Descendants: 0

Comment: Ok

AccessData Forensic Toolkit®

List by File Path
- None -

MS Access database
[File listing database](#)

List File Properties
- List File Properties -

Bookmarks
- None -

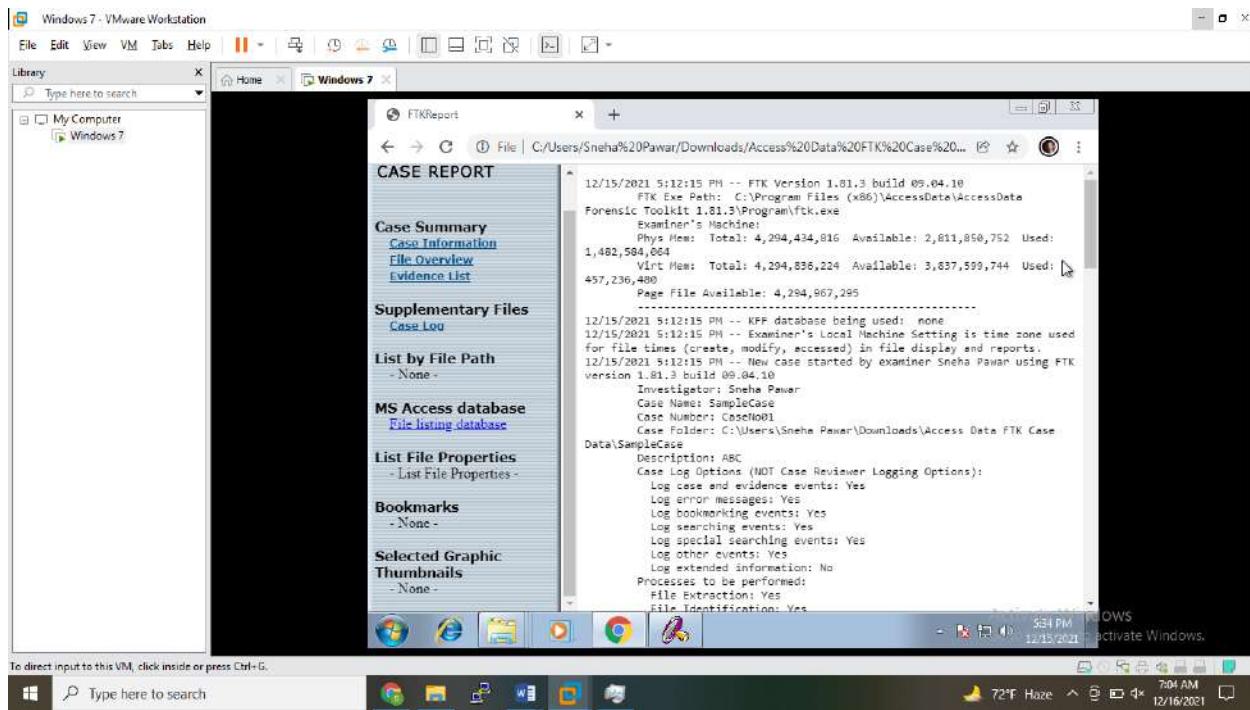
Selected Graphic Thumbnails
- None -



5:38 PM
12/15/2021

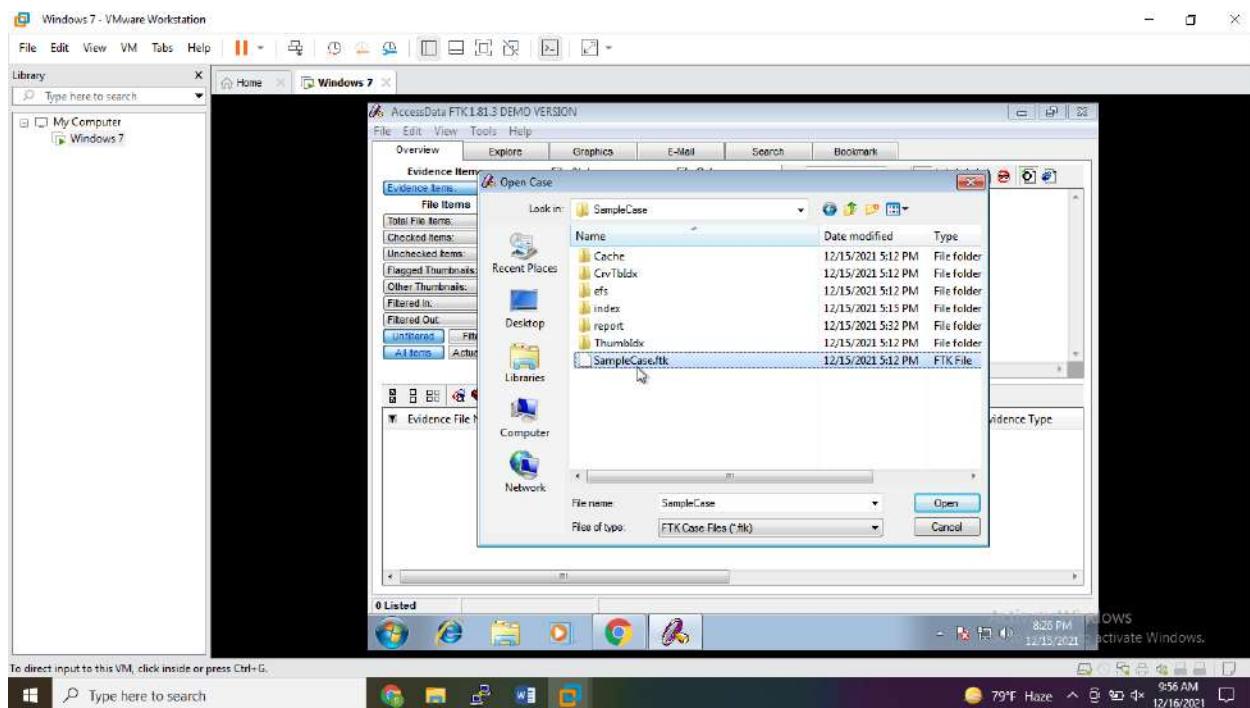
The screenshot shows a Windows 7 desktop environment within a VMware Workstation window. The taskbar at the bottom includes icons for Start, Internet Explorer, File Explorer, Task View, Edge, Google Chrome, and File Explorer. The system tray shows the date as 12/15/2021 and the time as 7:04 AM. A message in the system tray says 'activate Windows.' A search bar at the bottom left says 'Type here to search'. The main window displays the FTK Report software interface, specifically the 'File Overview' section. The left sidebar contains links for Case Summary, Evidence Information, File Overview, Evidence List, Supplementary Files, Case Log, List by File Path (None), MS Access database (File listing database), List File Properties (List File Properties), Bookmarks (None), and Selected Graphic Thumbnails (None). The right pane shows the following data:

- Evidence Items**: Evidence Items: 1
- File Items**: Total File Items: 11, Flagged Thumbnails: 0, Other Thumbnails: 0
- File Status**: KFF Alert Files: 0, Bookmarked Items: 0, Bad Extension: 0, Encrypted Files: 0, From E-mail: 0, Deleted Files: 0, From Recycle Bin: 0, Duplicate Items: 0, OLE Subitems: 0, Flagged Ignored: 0, KFF Ignorable: 0, Data Carved Files: 0
- File Category**: Documents: 0



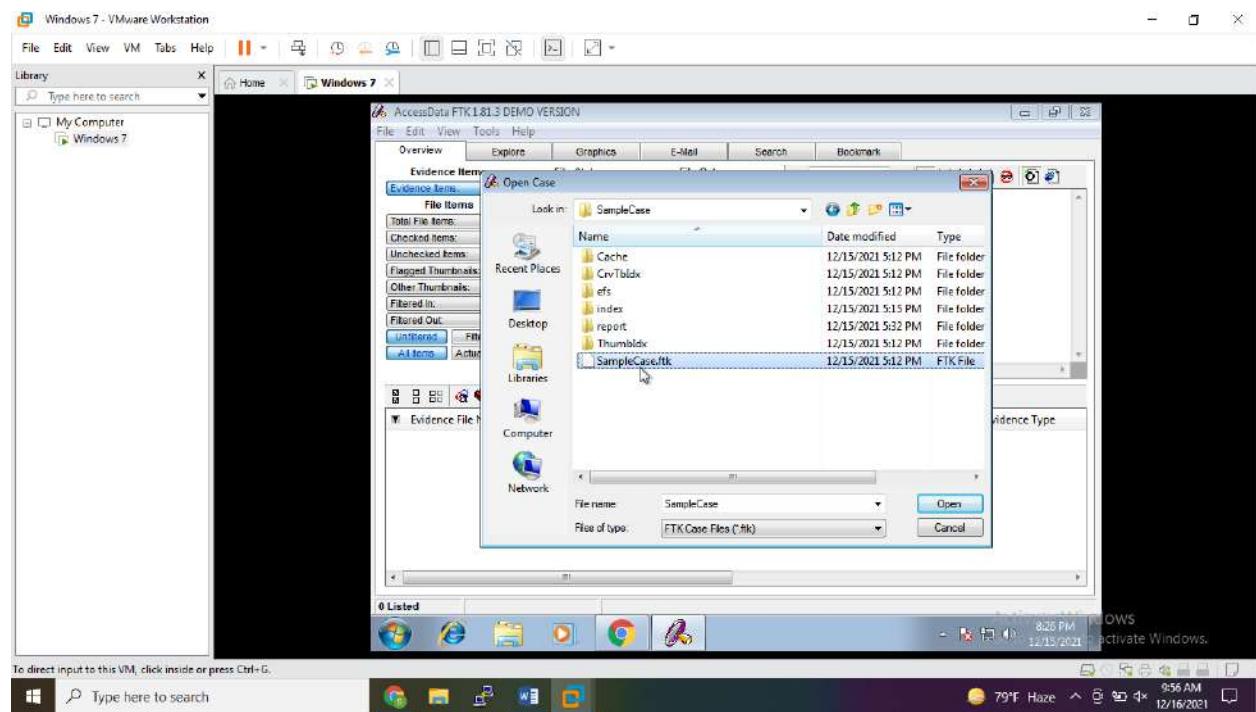
Now, let's perform Email Forensic on this. Open Existing Case that we have created.

File – Open Case

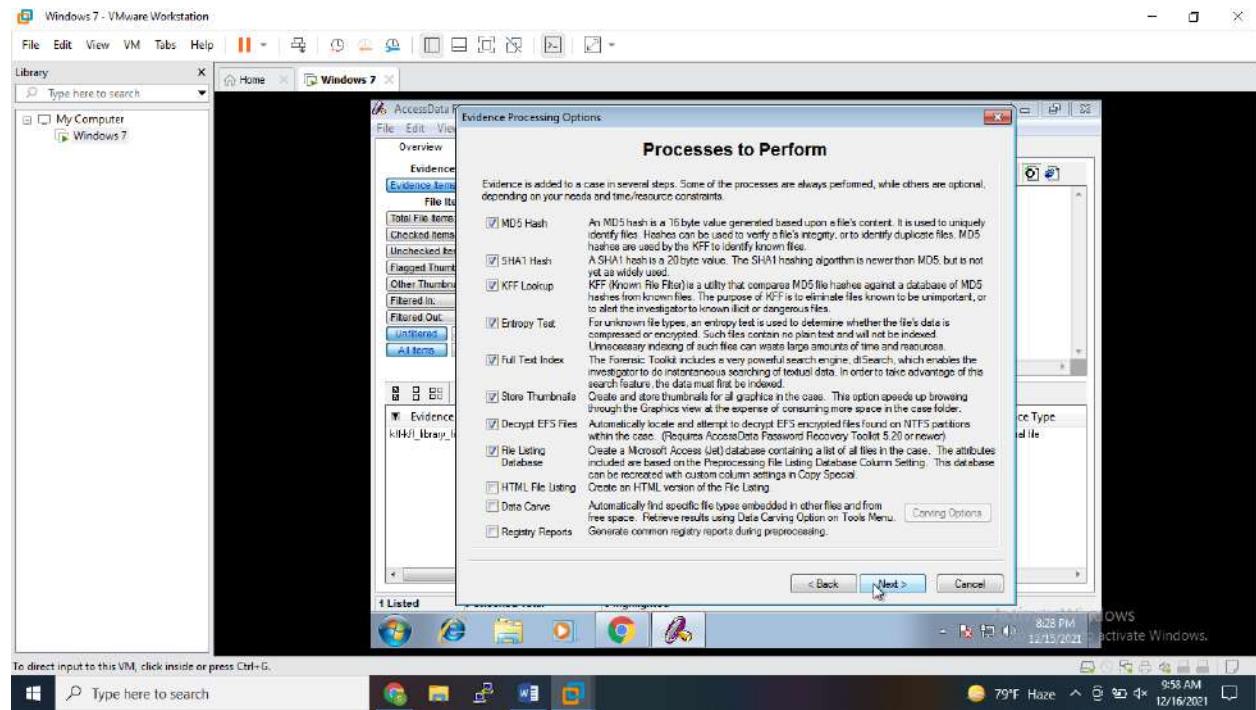


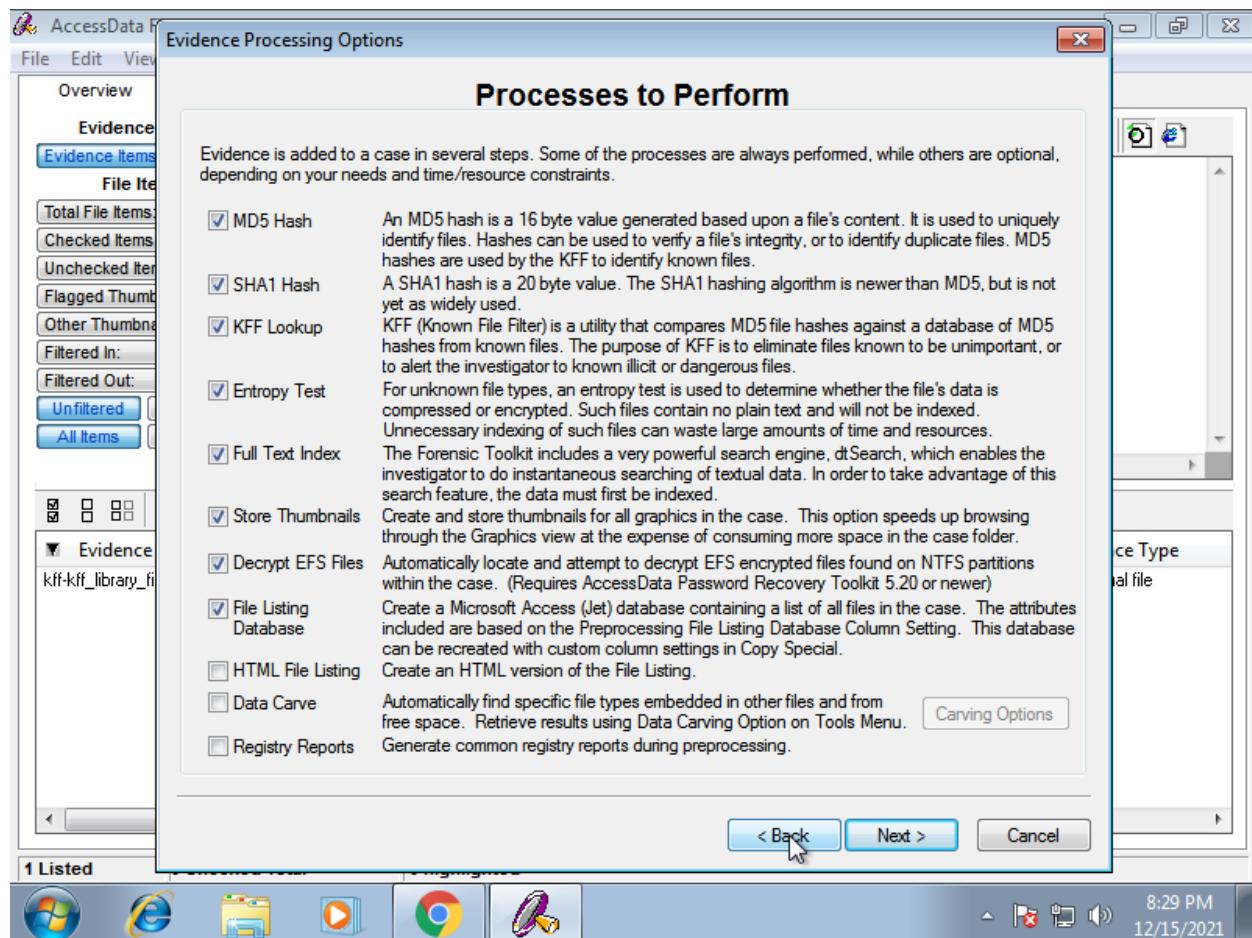
Now File – Add Evidence, and add Outlook's pst file.

Keep this by default.

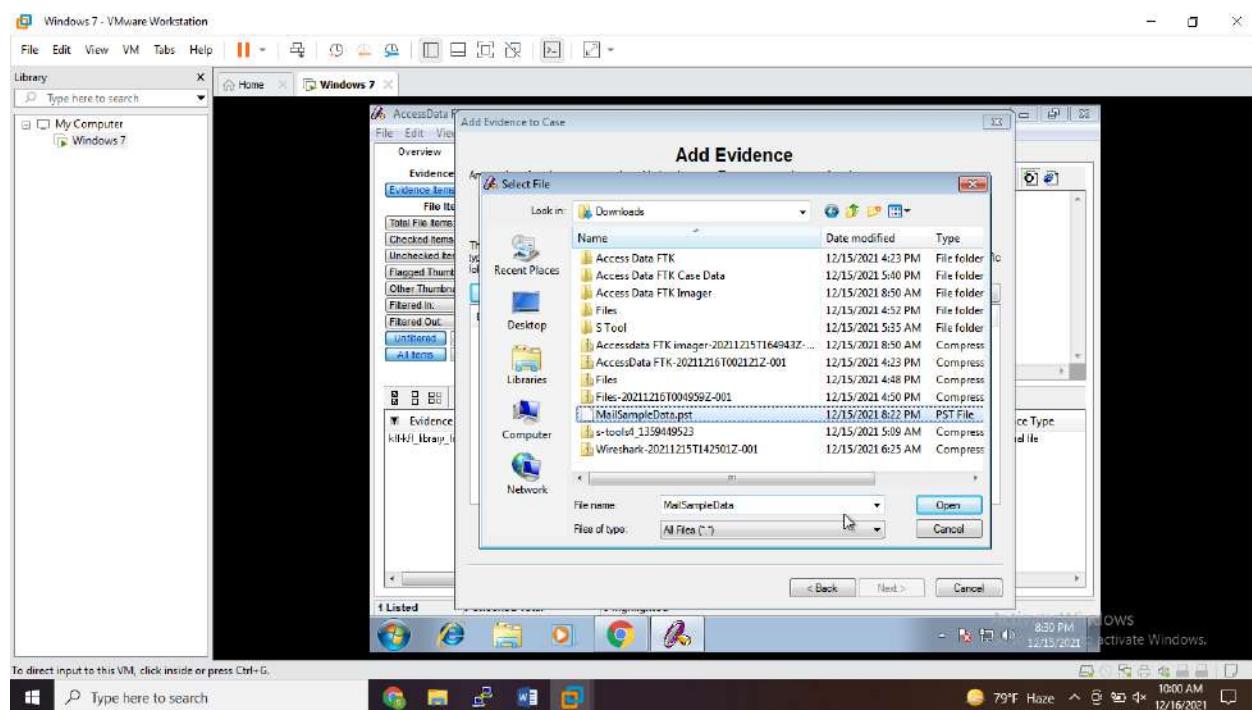


Click Next

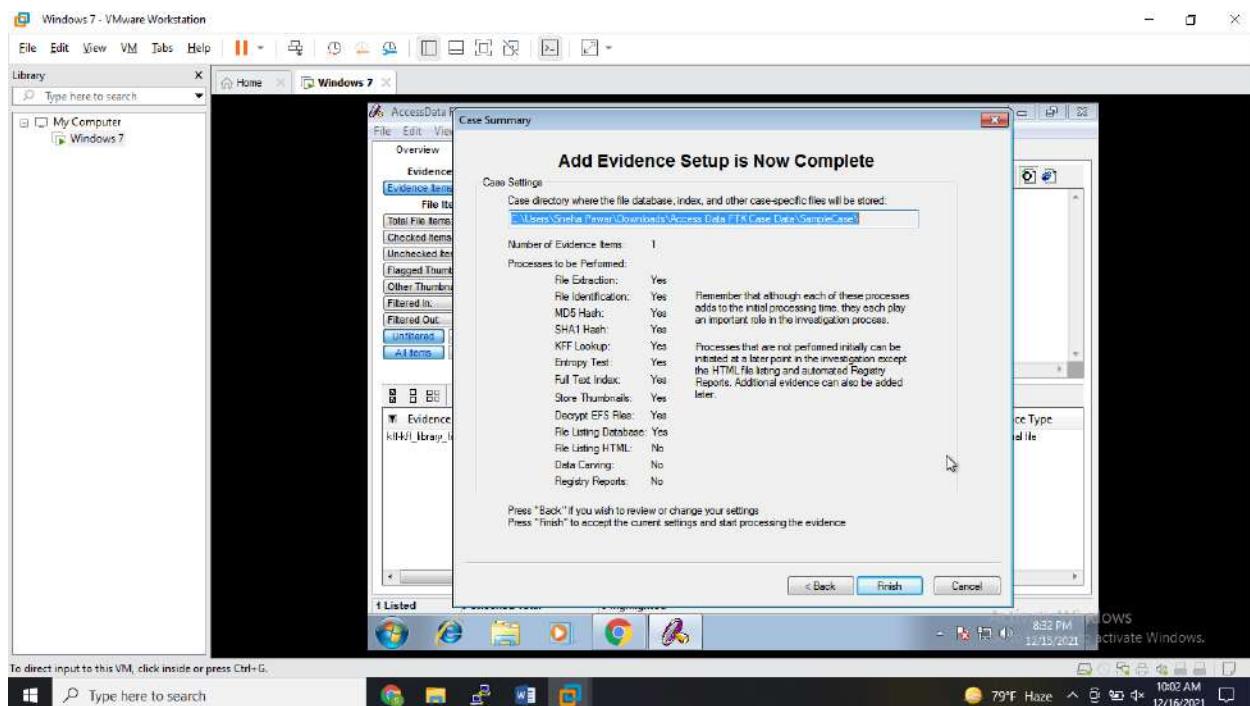
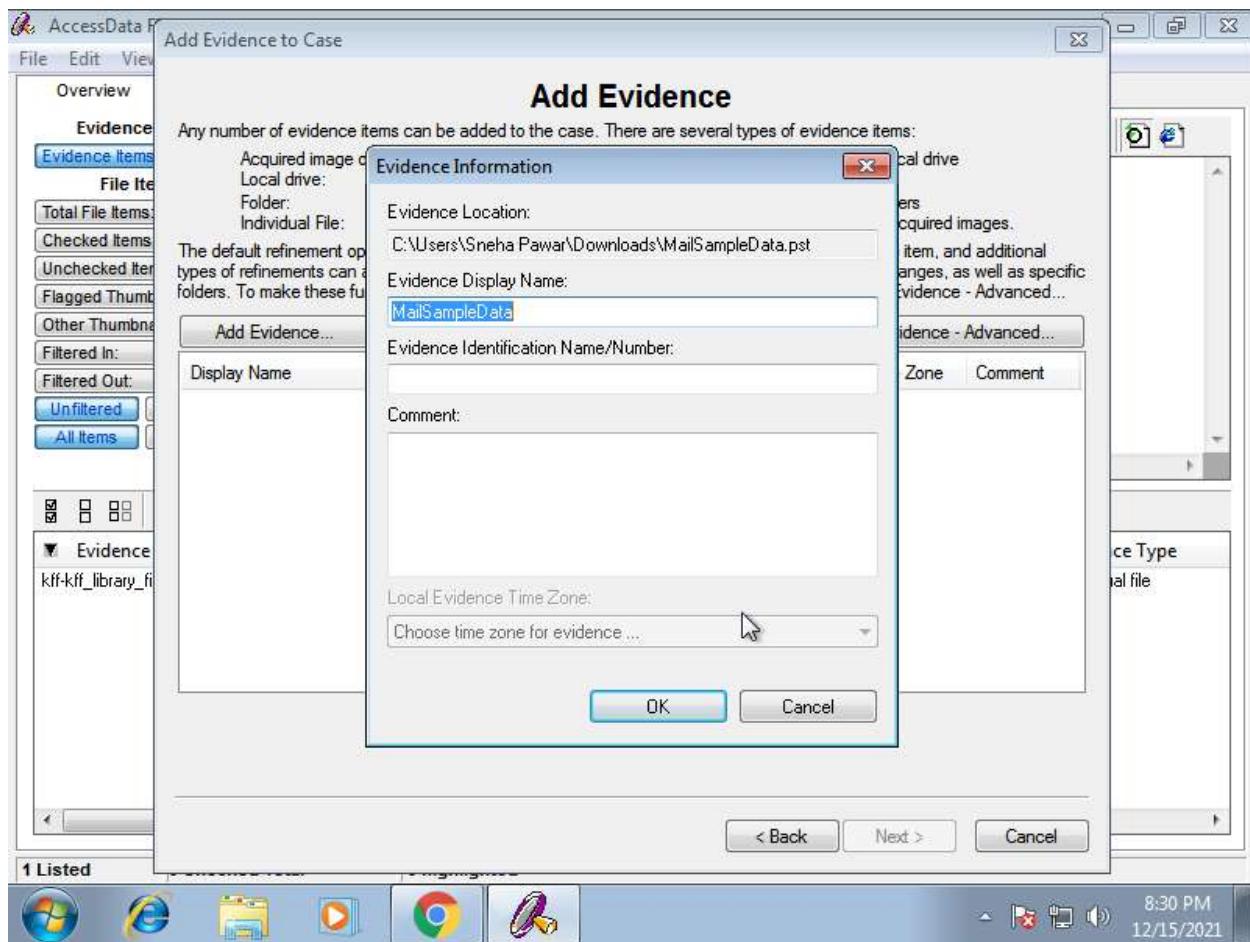




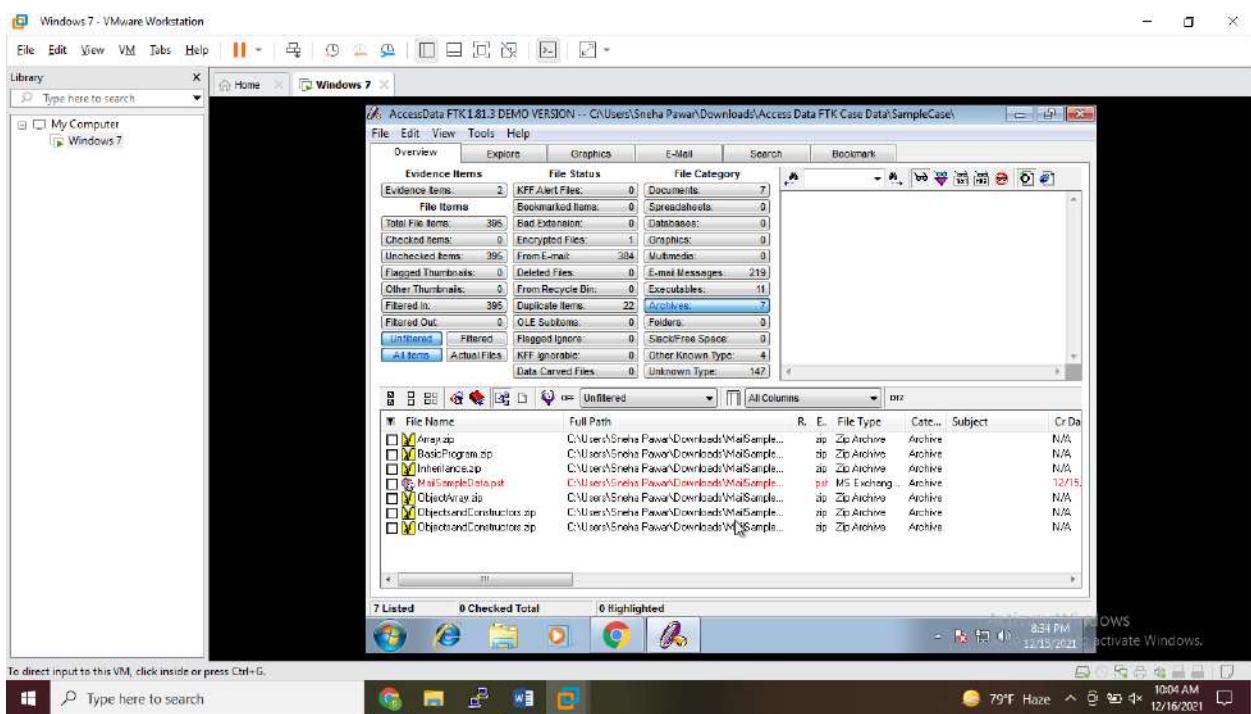
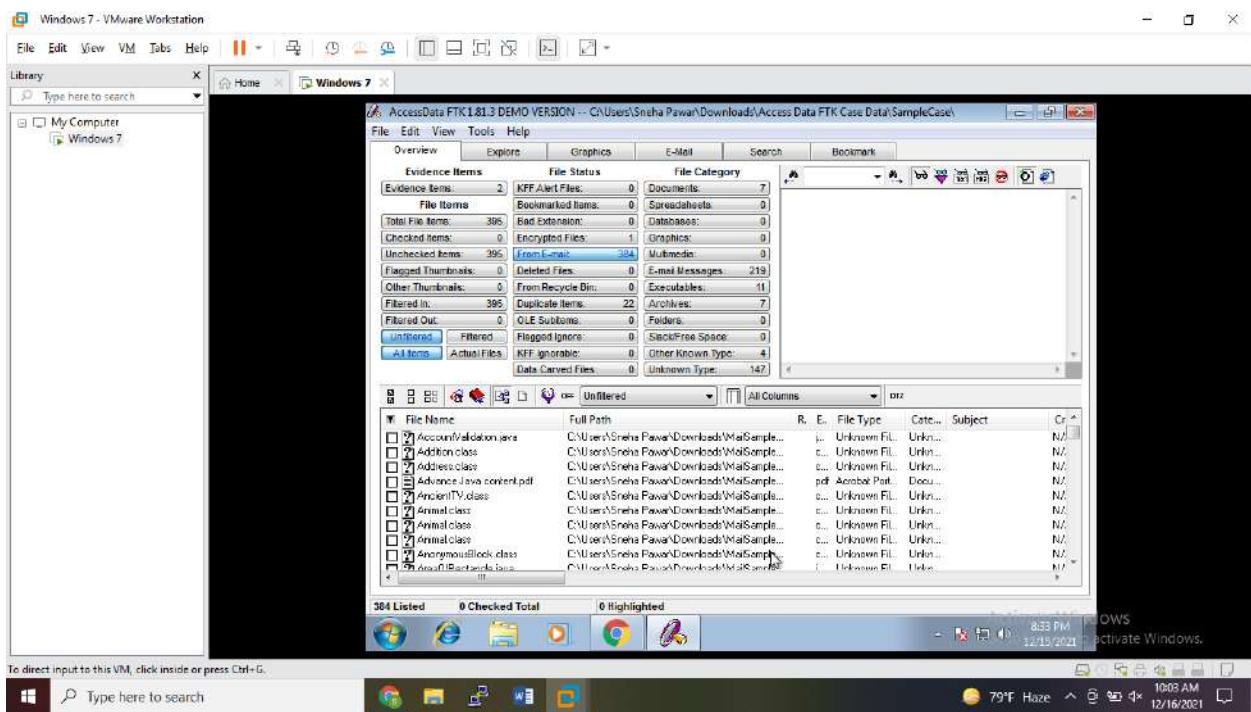
Then Add Evidence – Individual File – Browse location of a pst file.

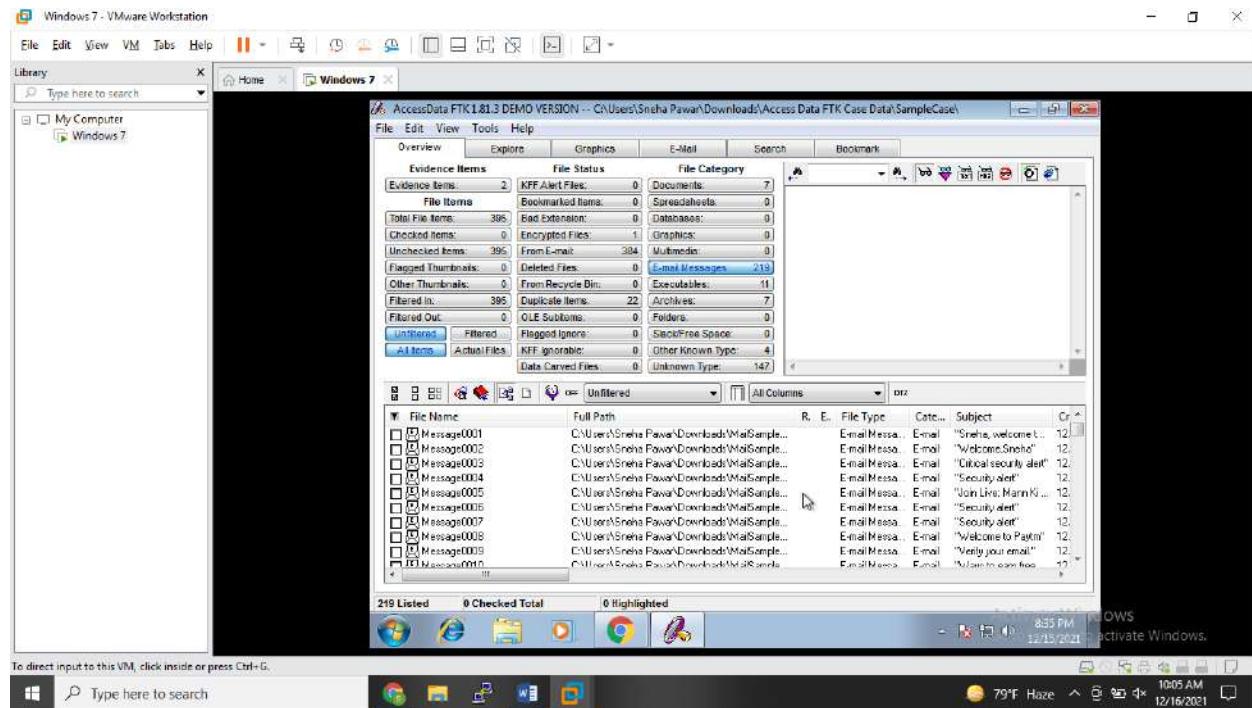


Click on Ok. And then click on Next.

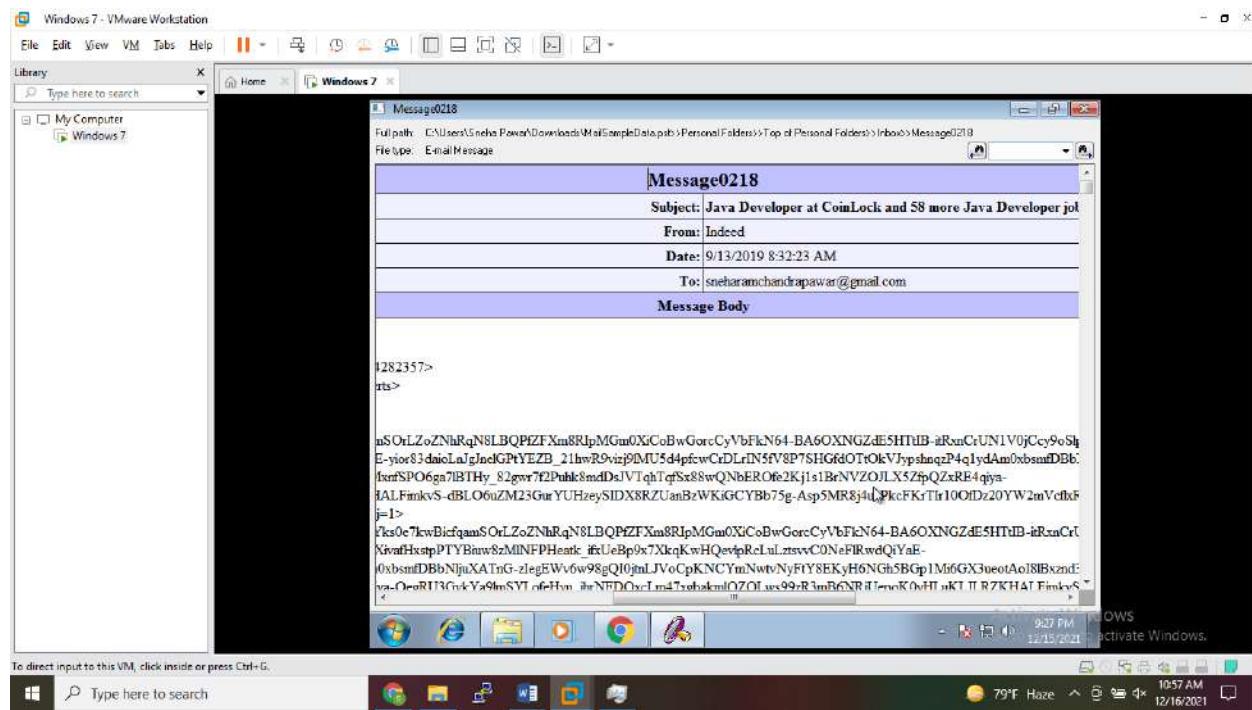


Emails will get acquired as you can see after double clicking on an evidence.



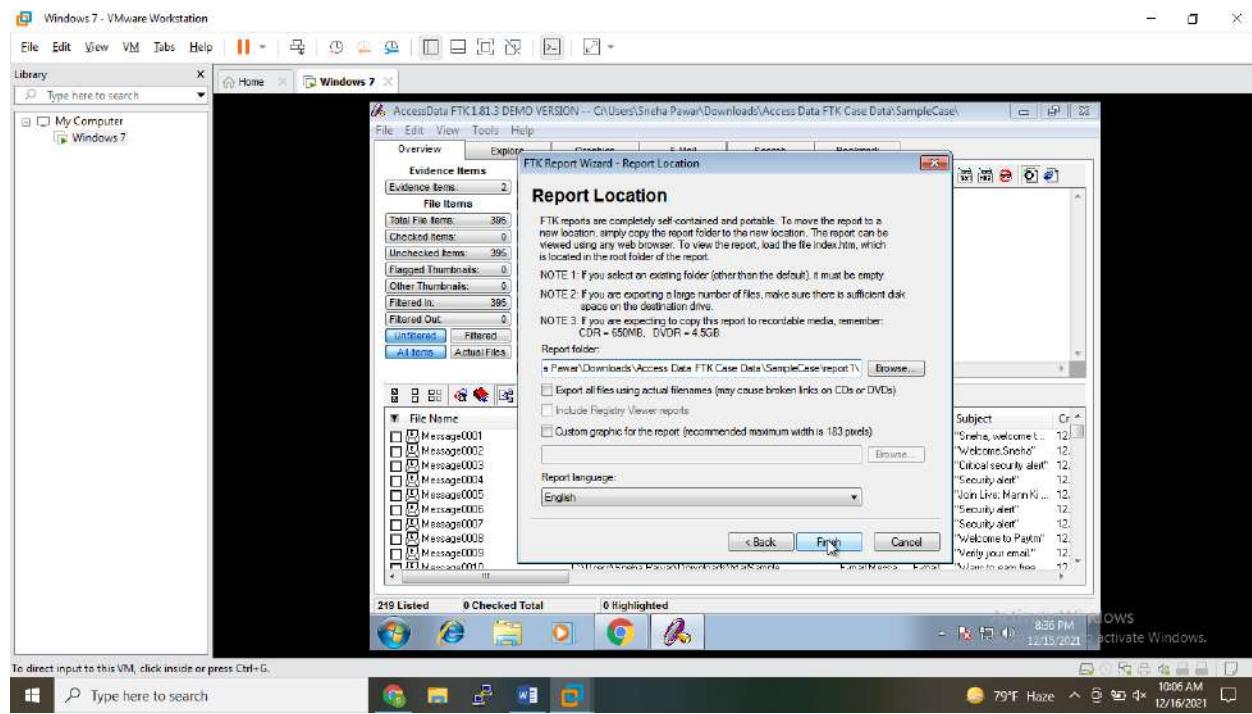
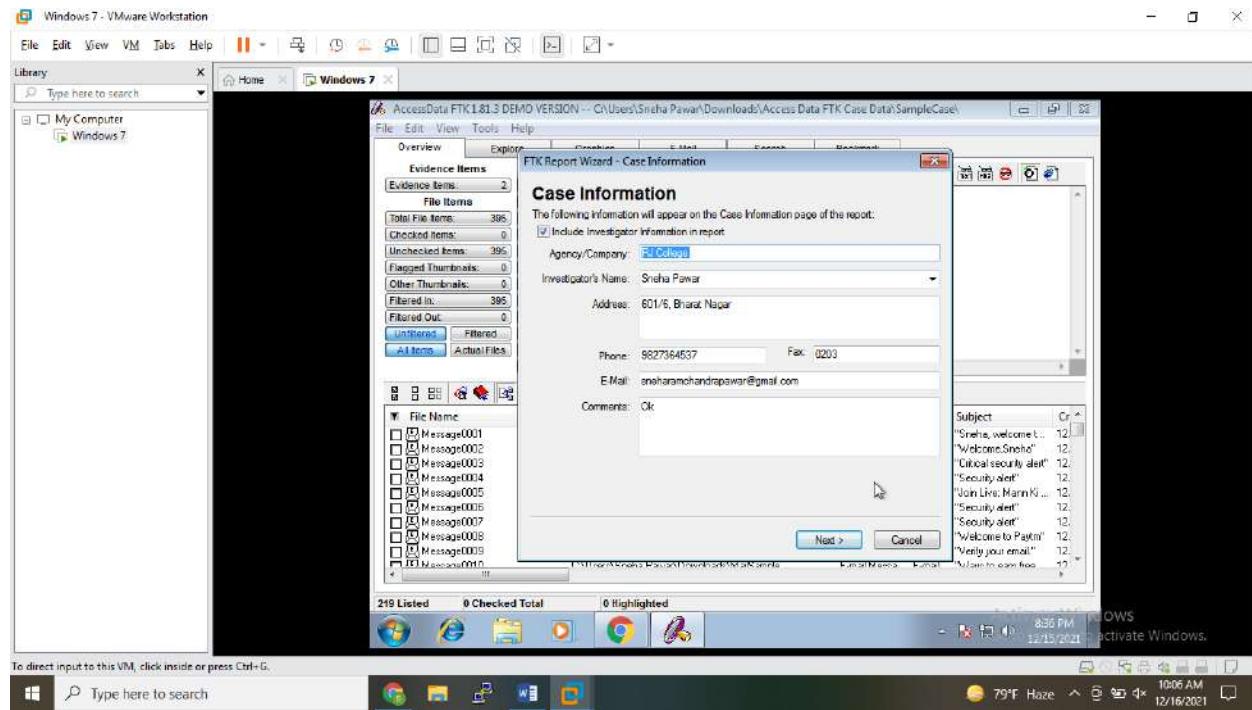


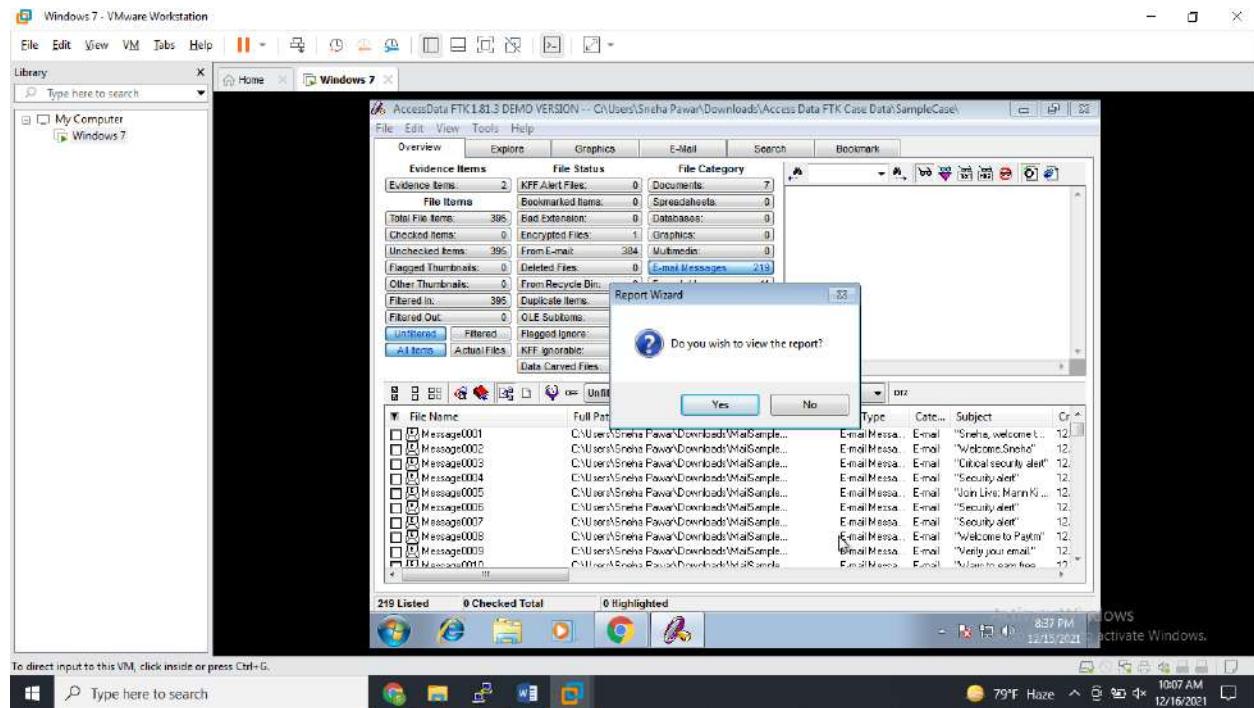
Right click on Mail to see it in Detached view.



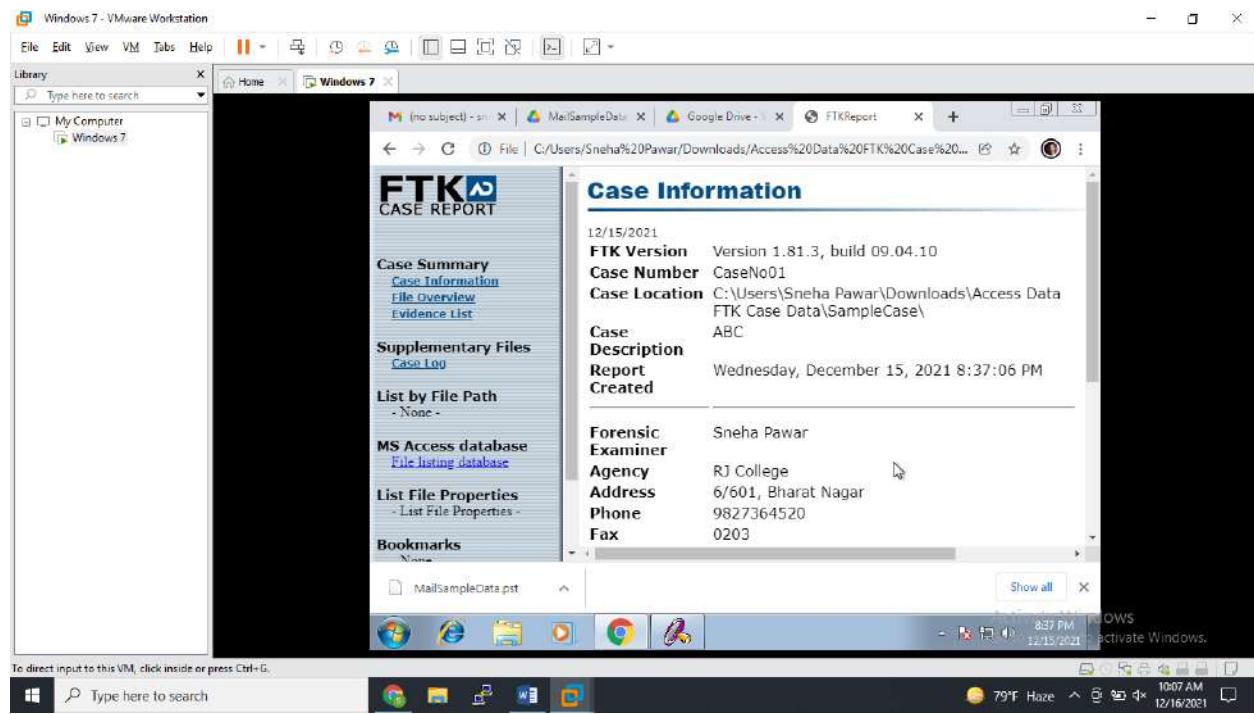
Steps:

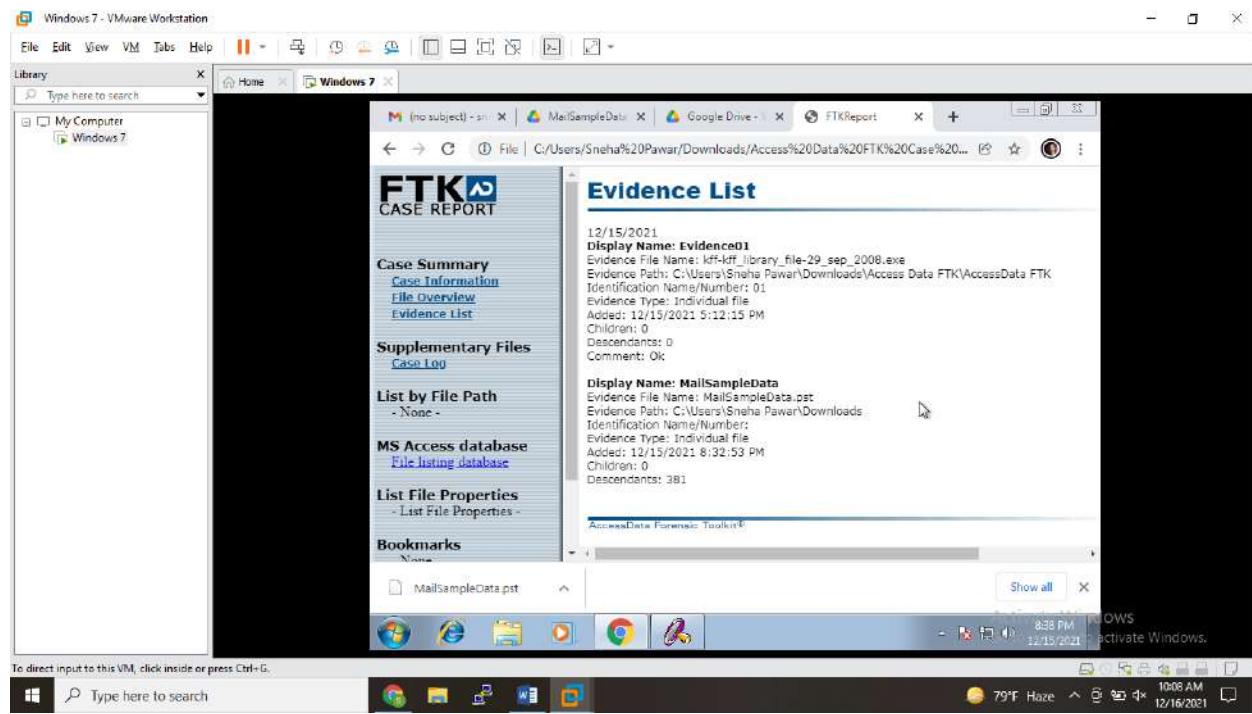
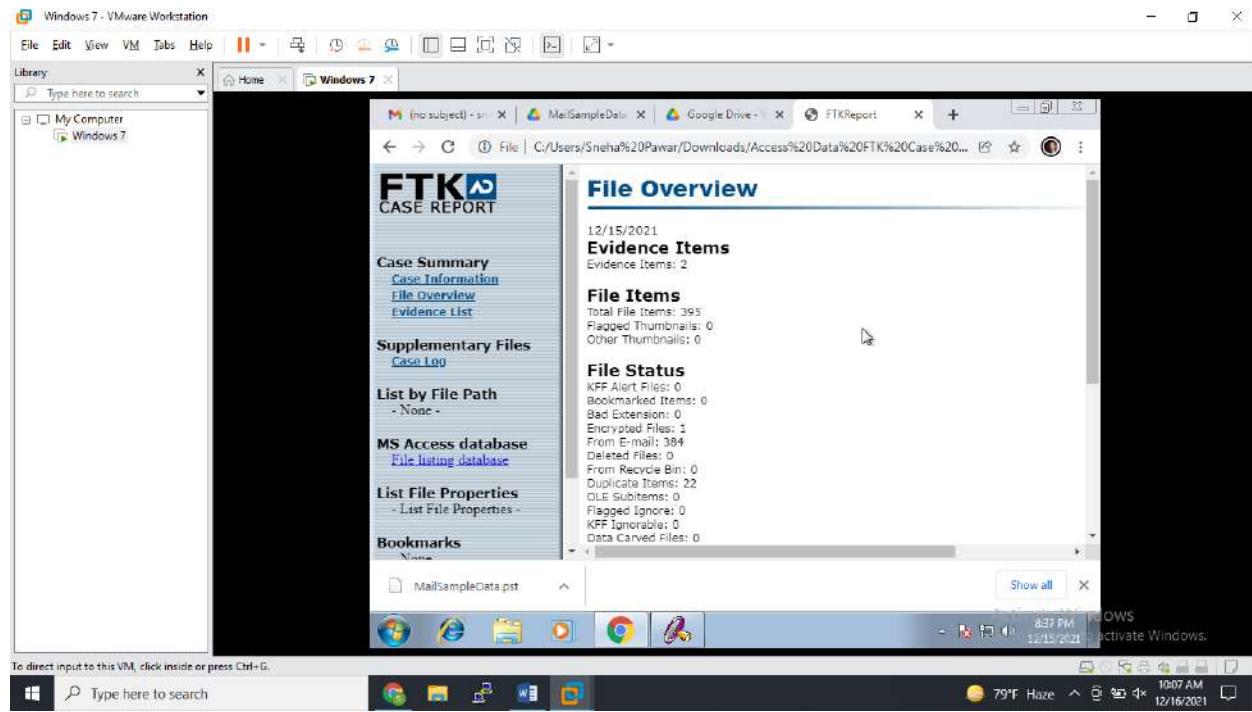
Now click on Report Wizard. And keep options by default and click on Next.

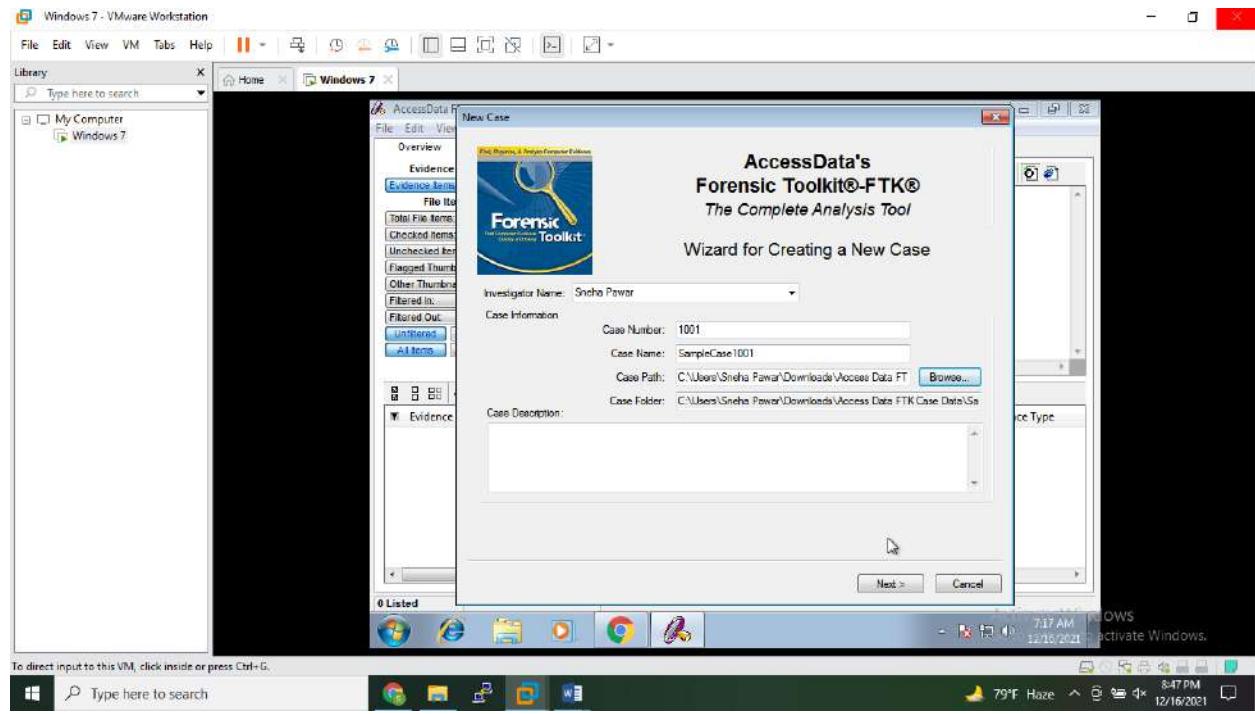
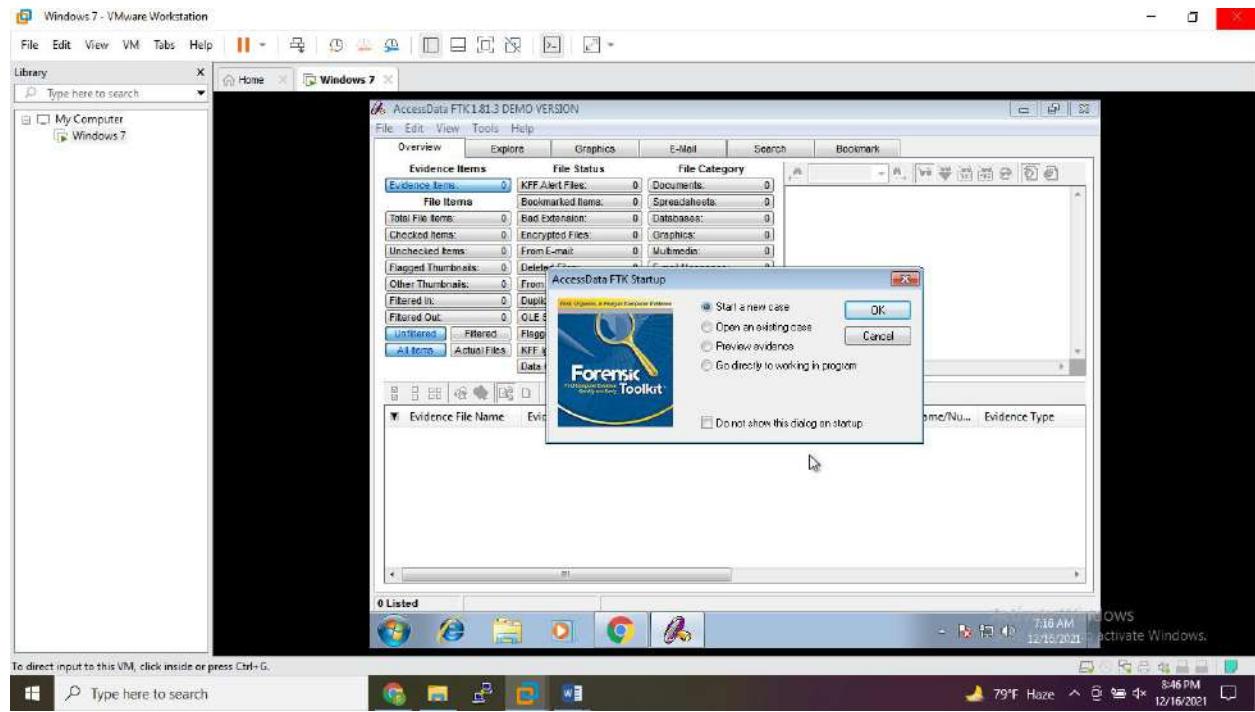


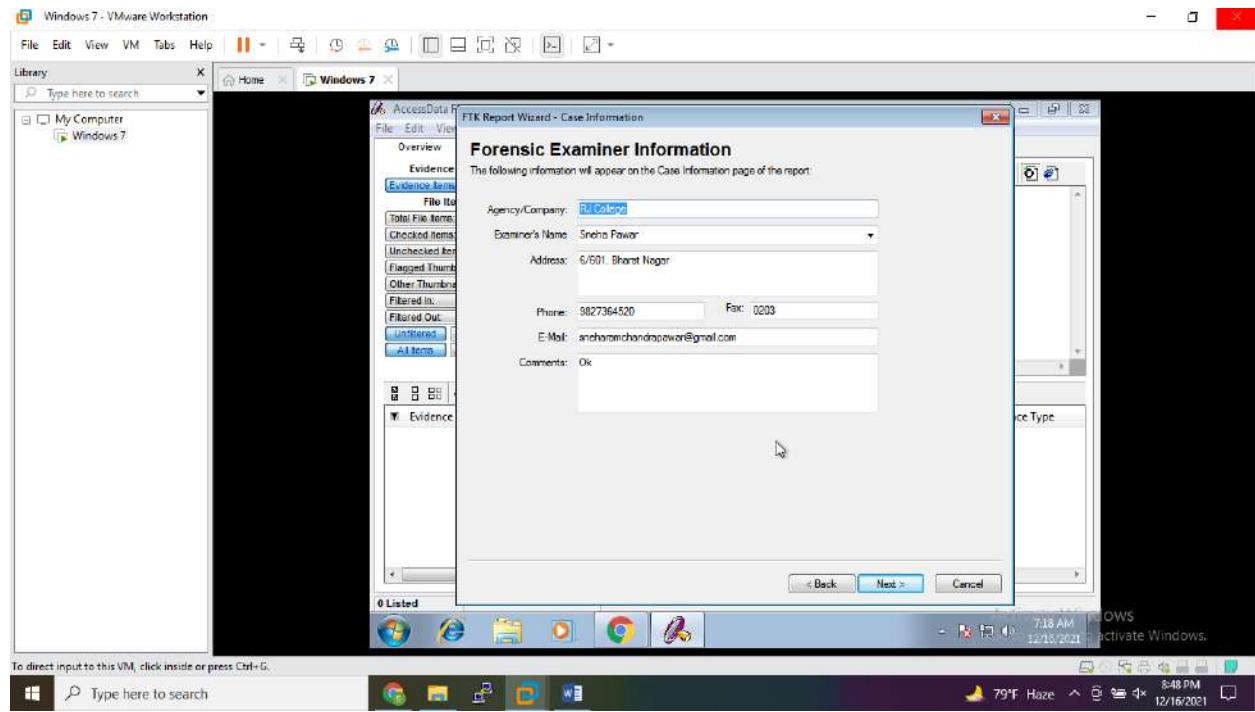
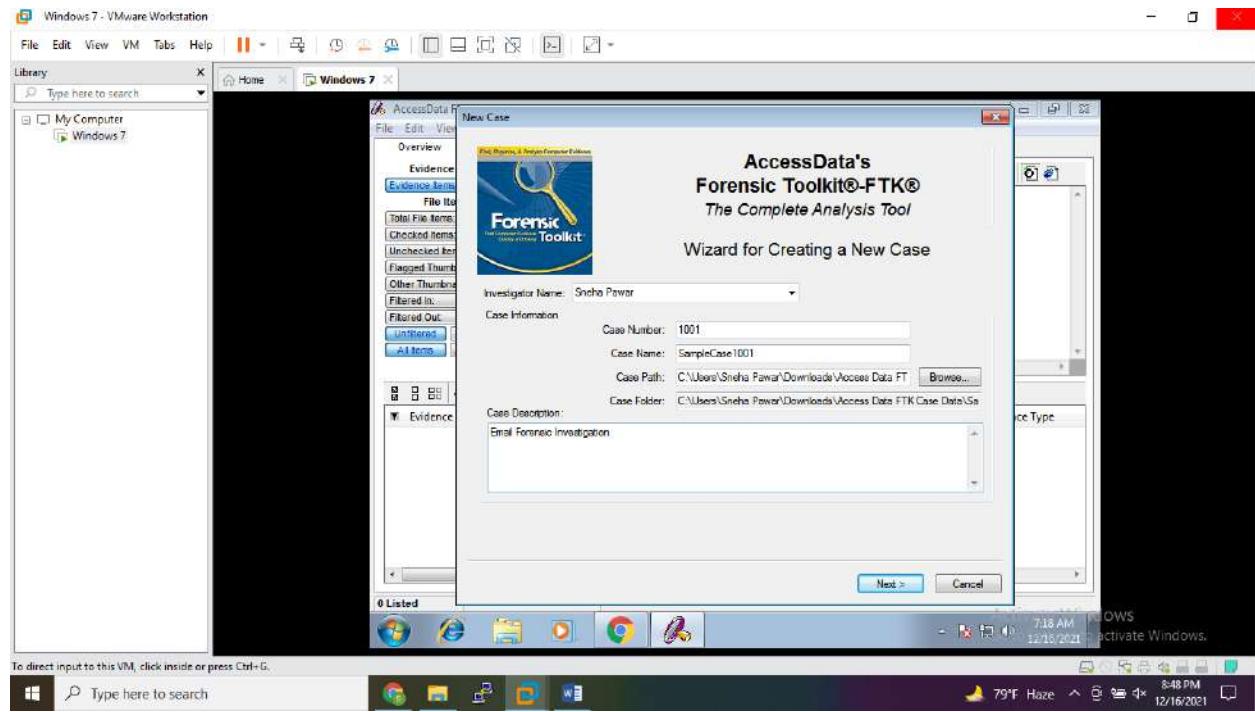


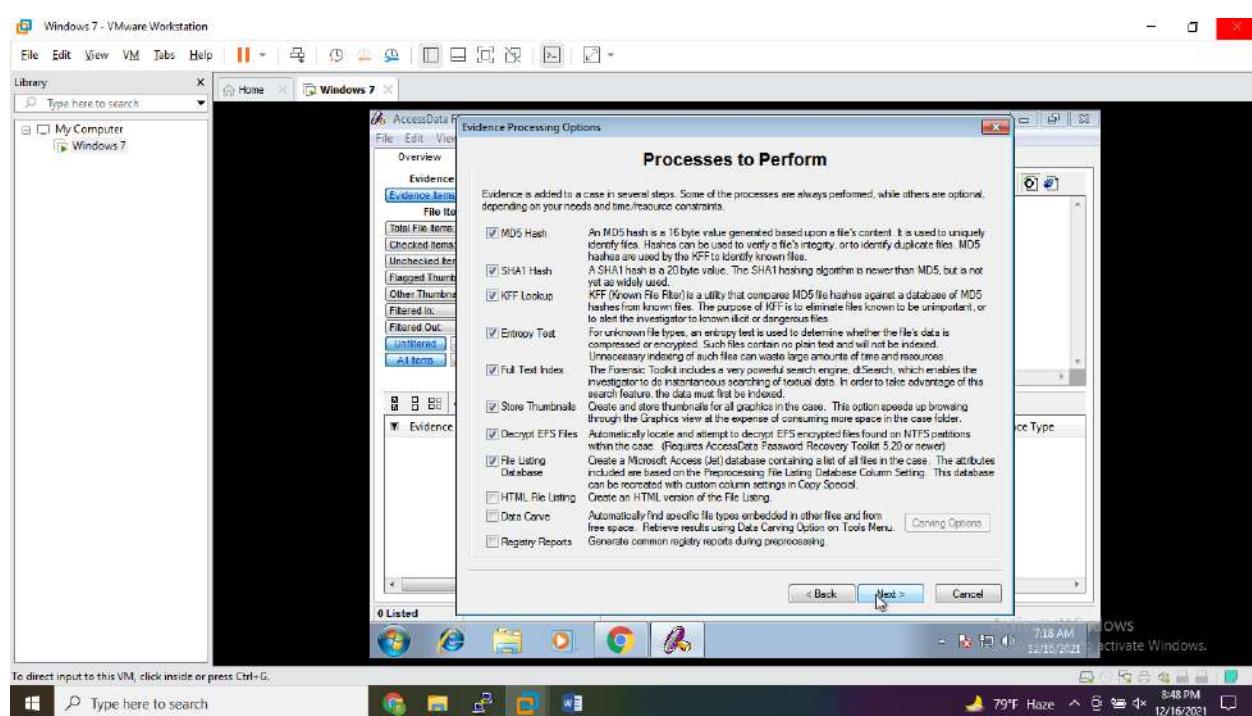
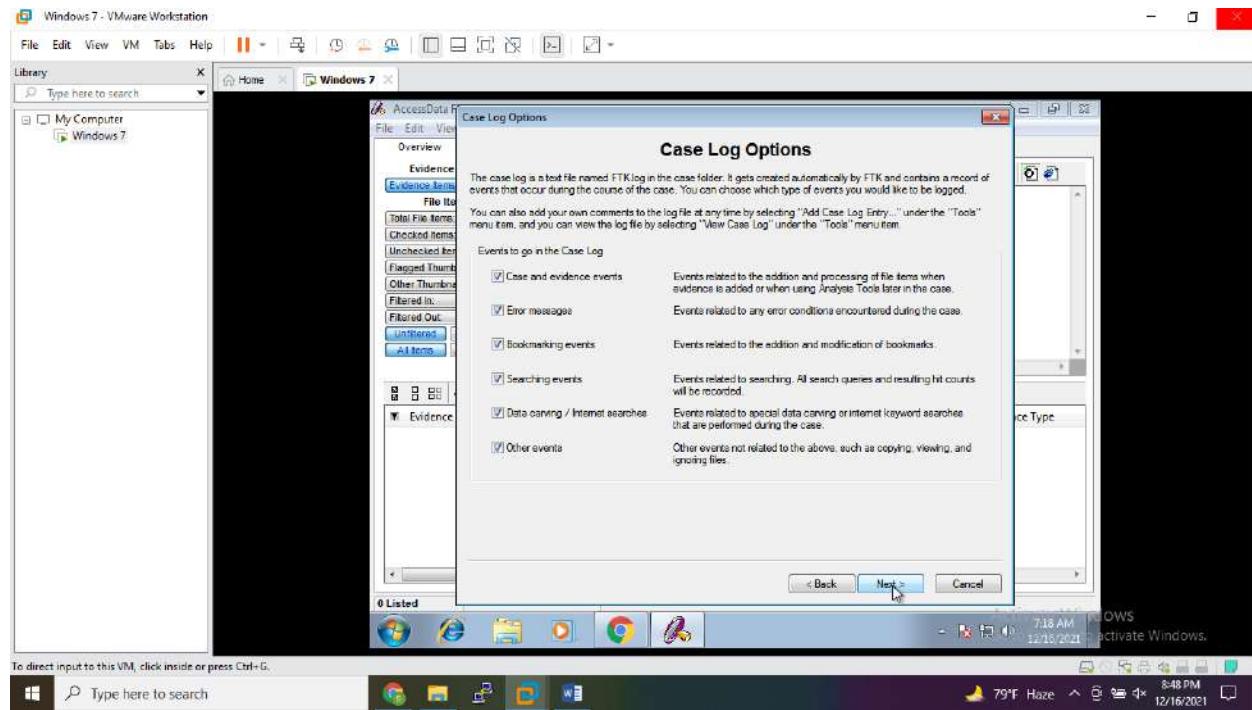
Click on Yes.

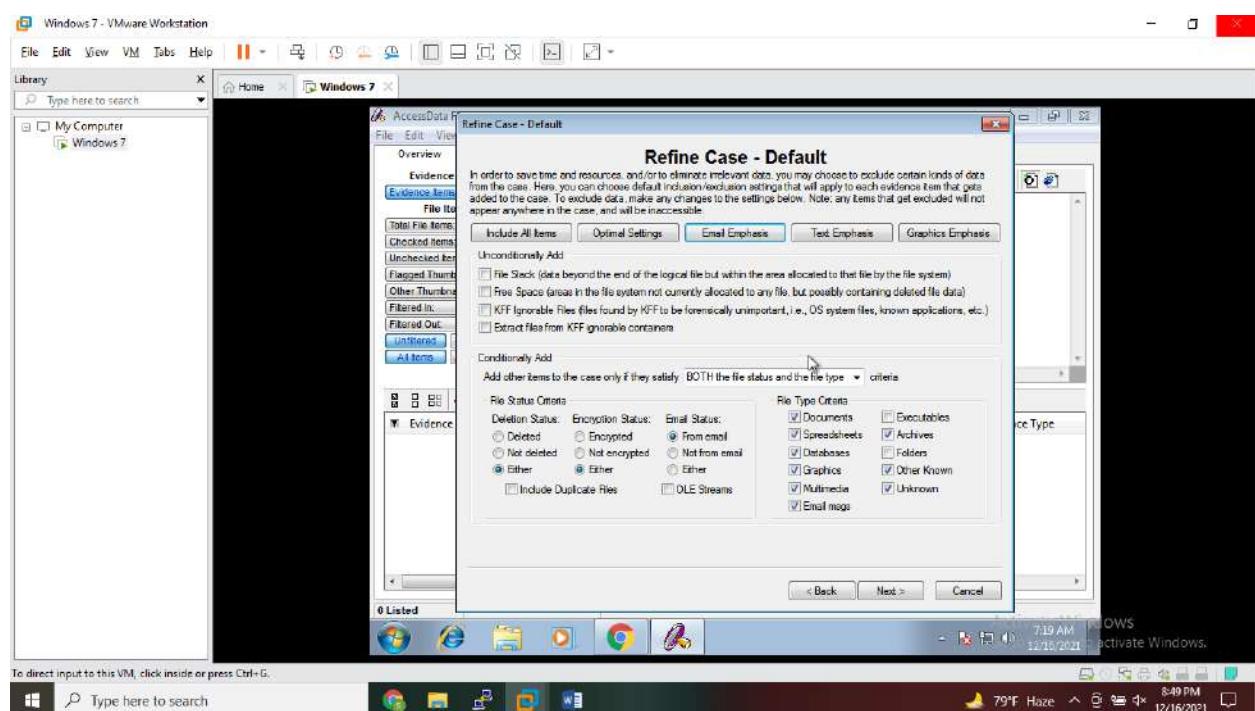
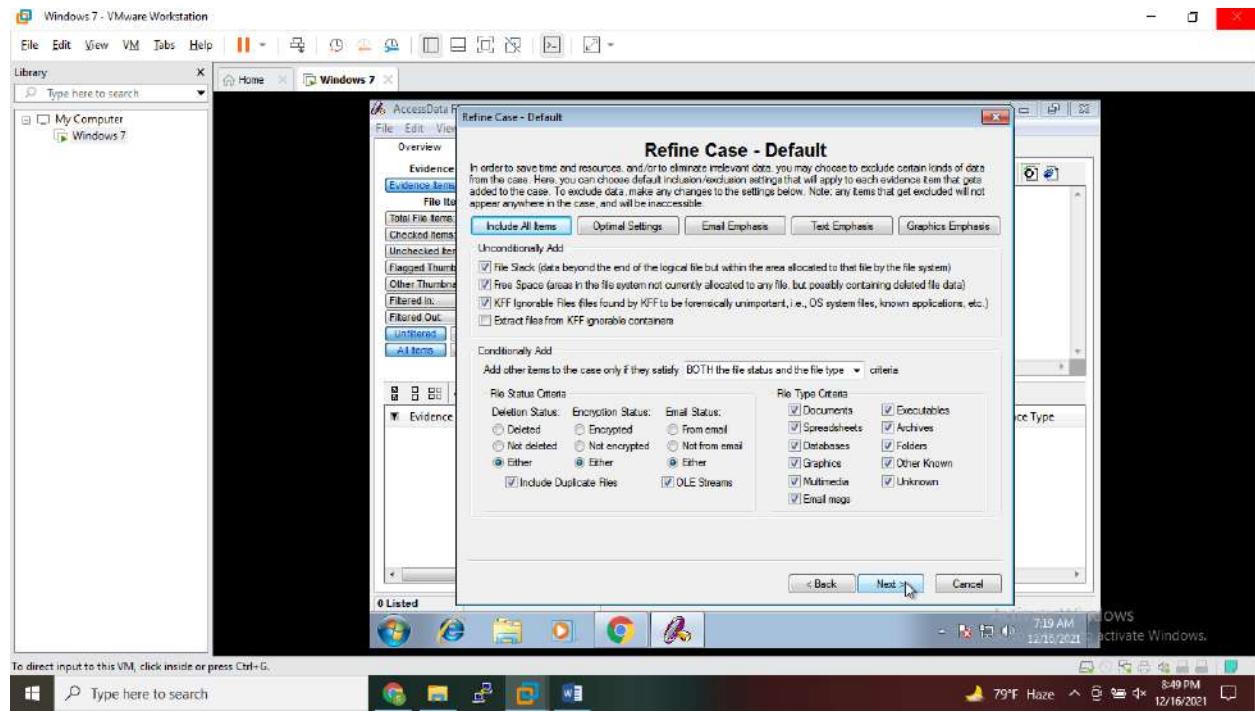


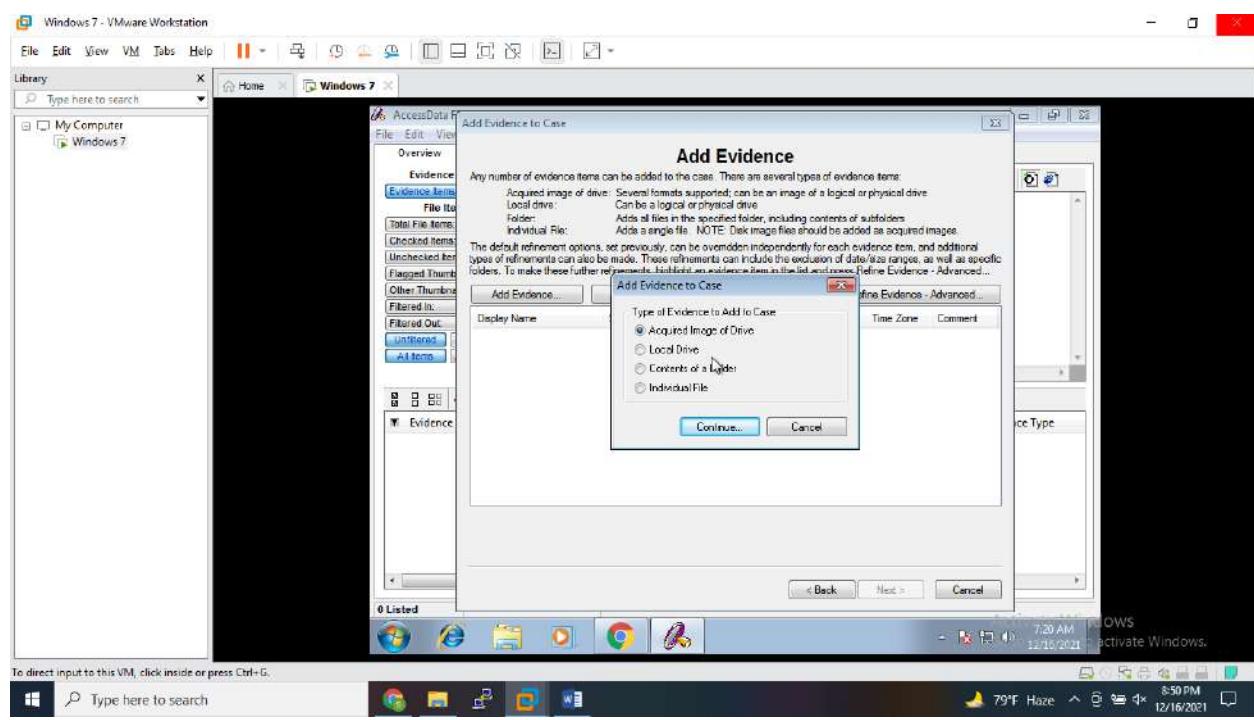
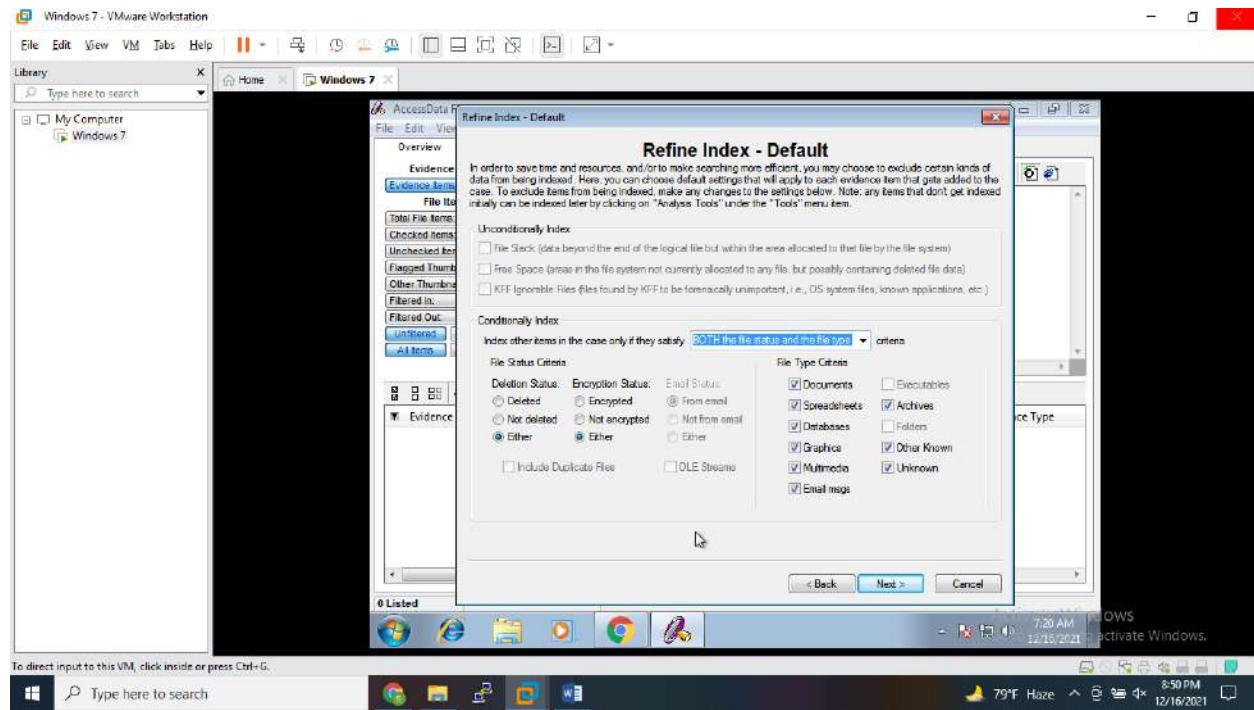


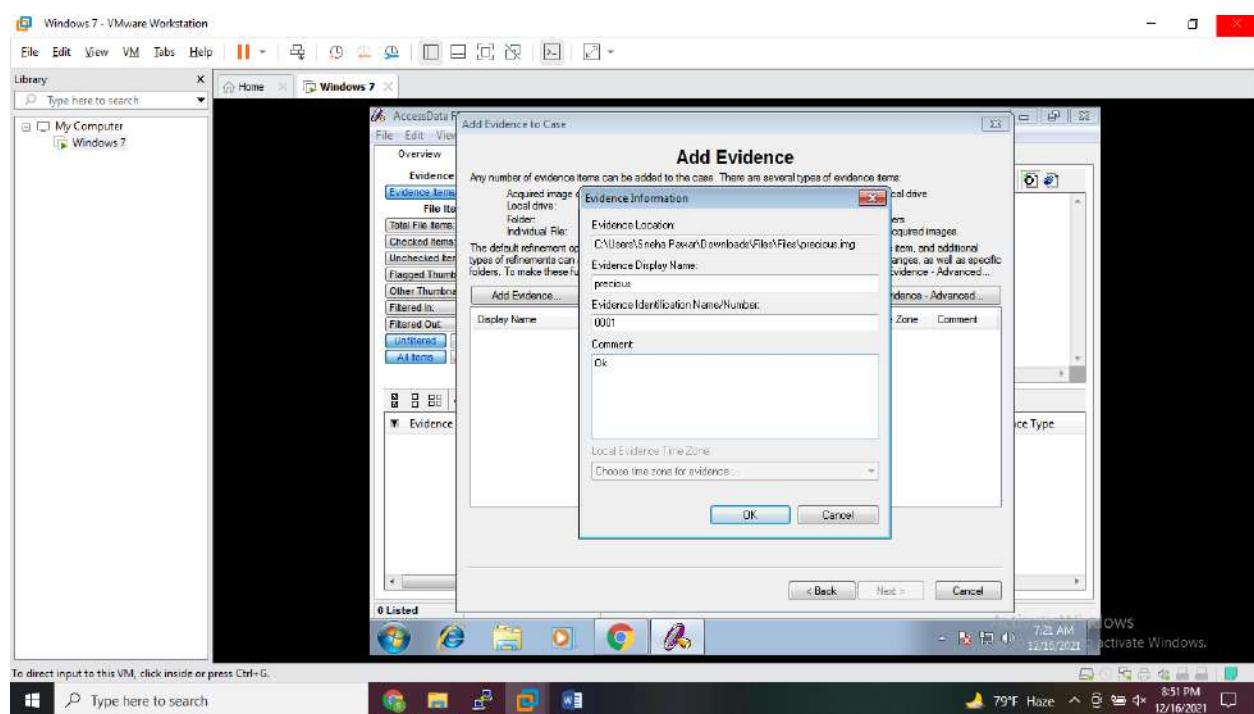
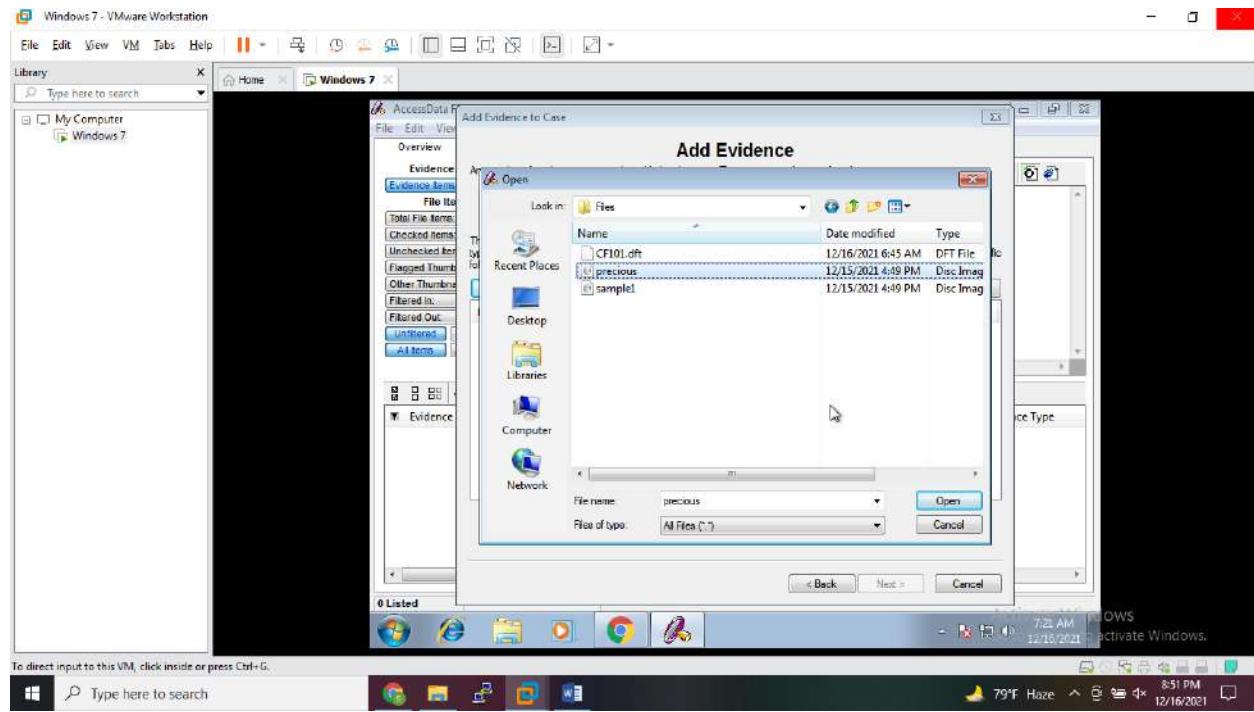


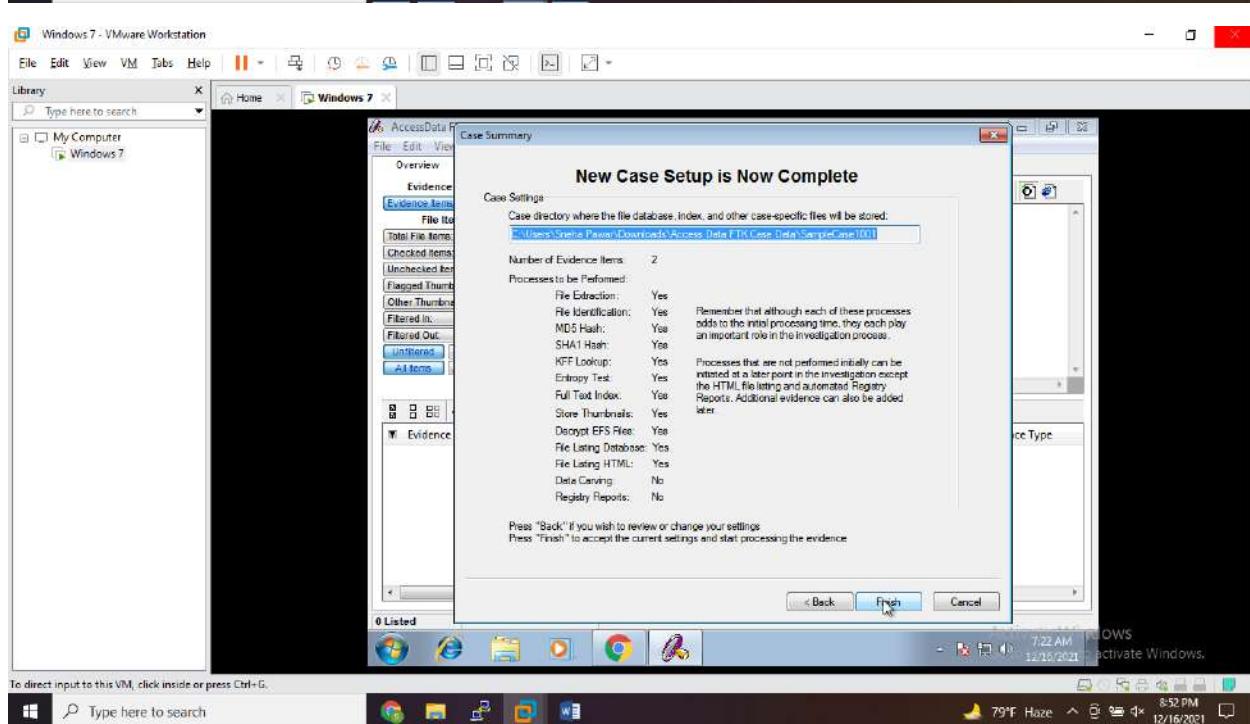
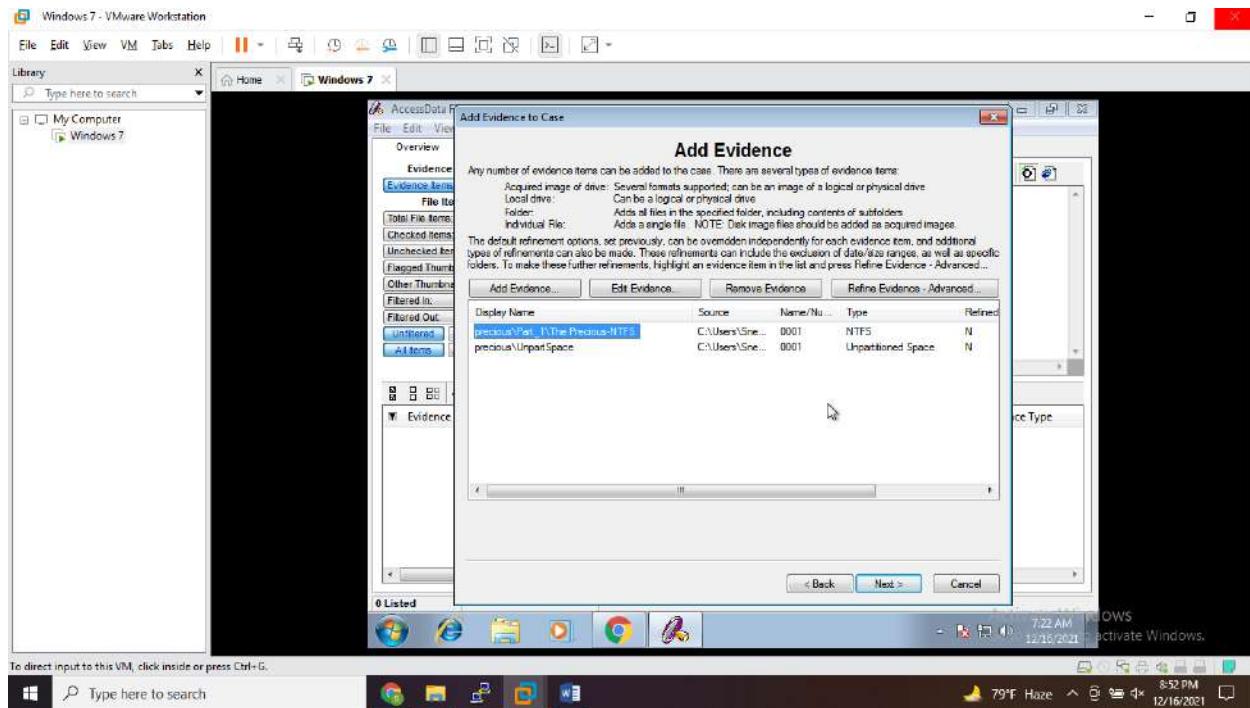


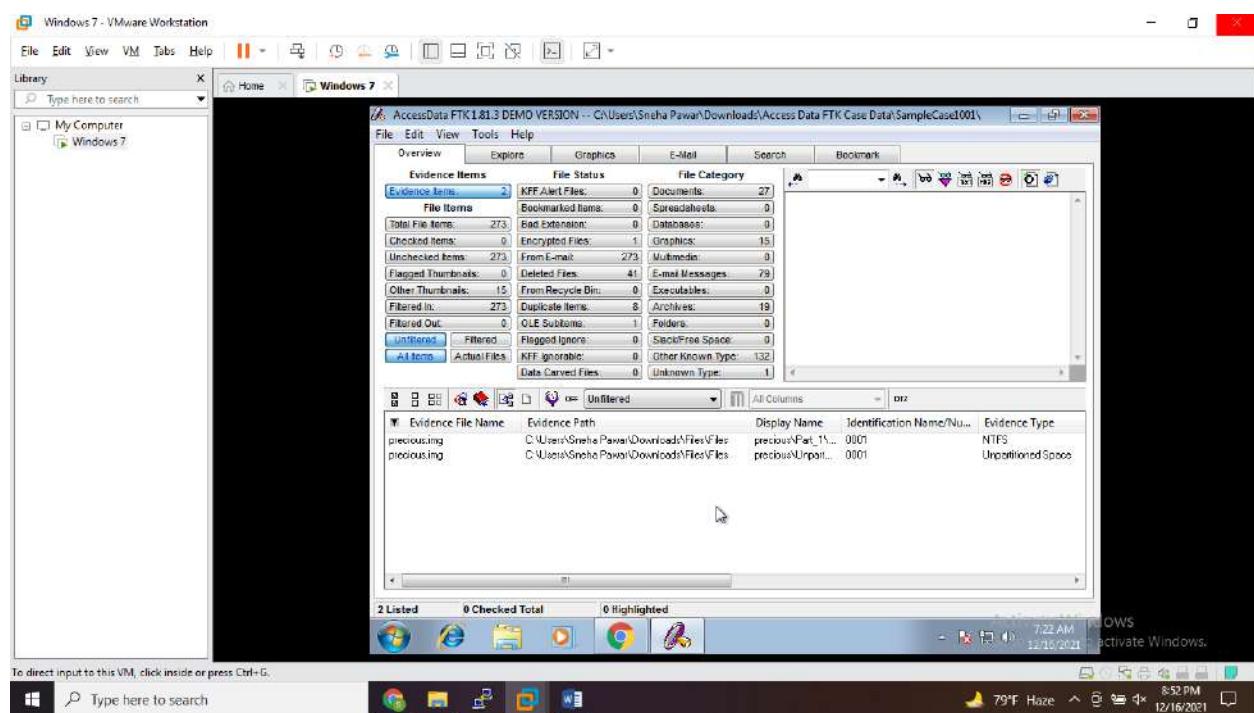
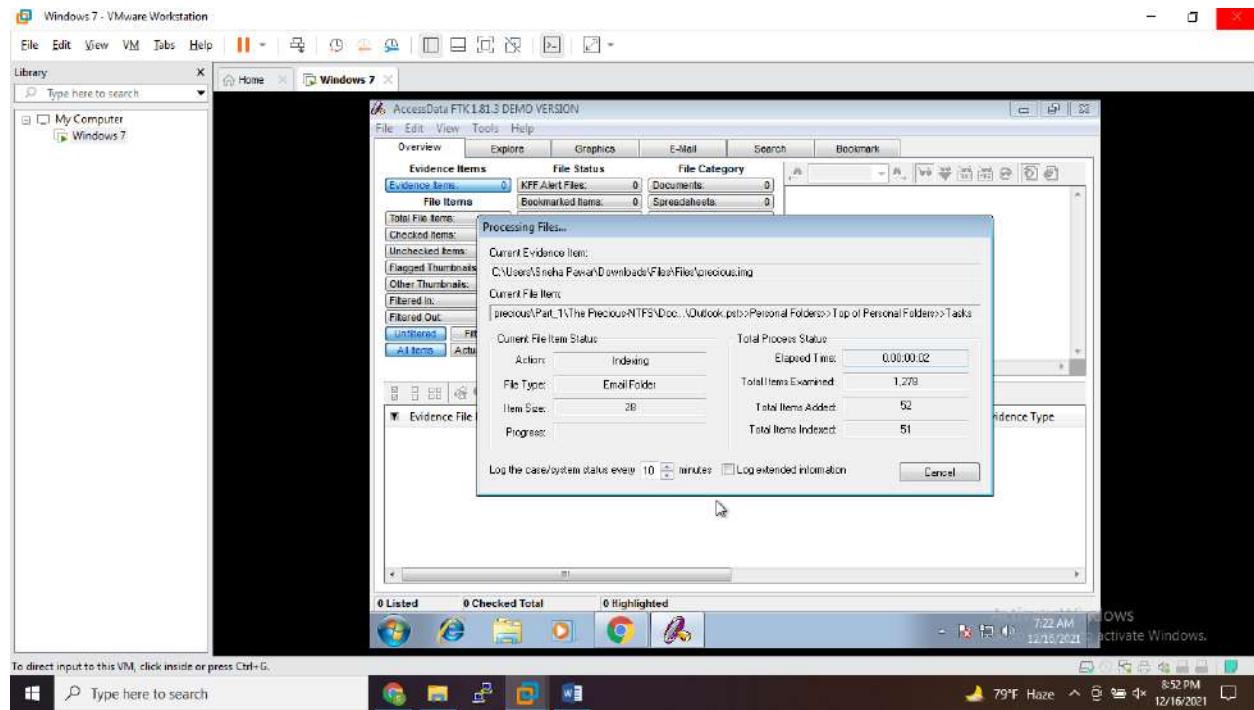


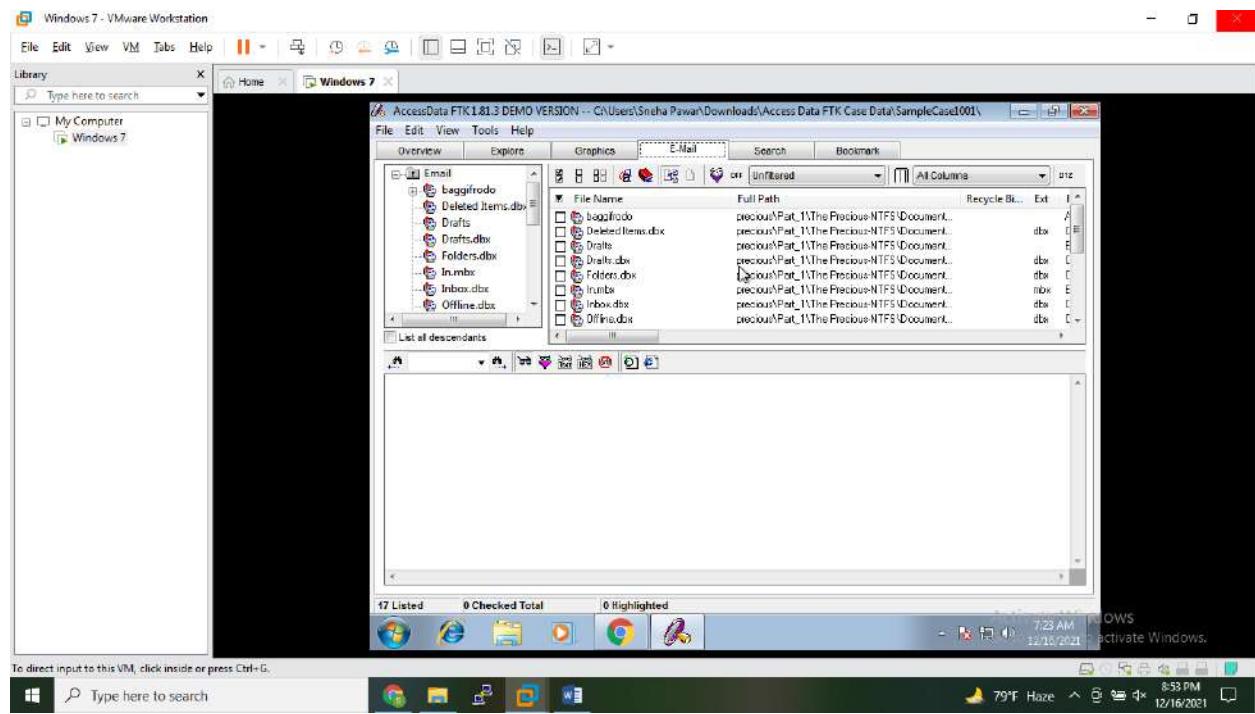
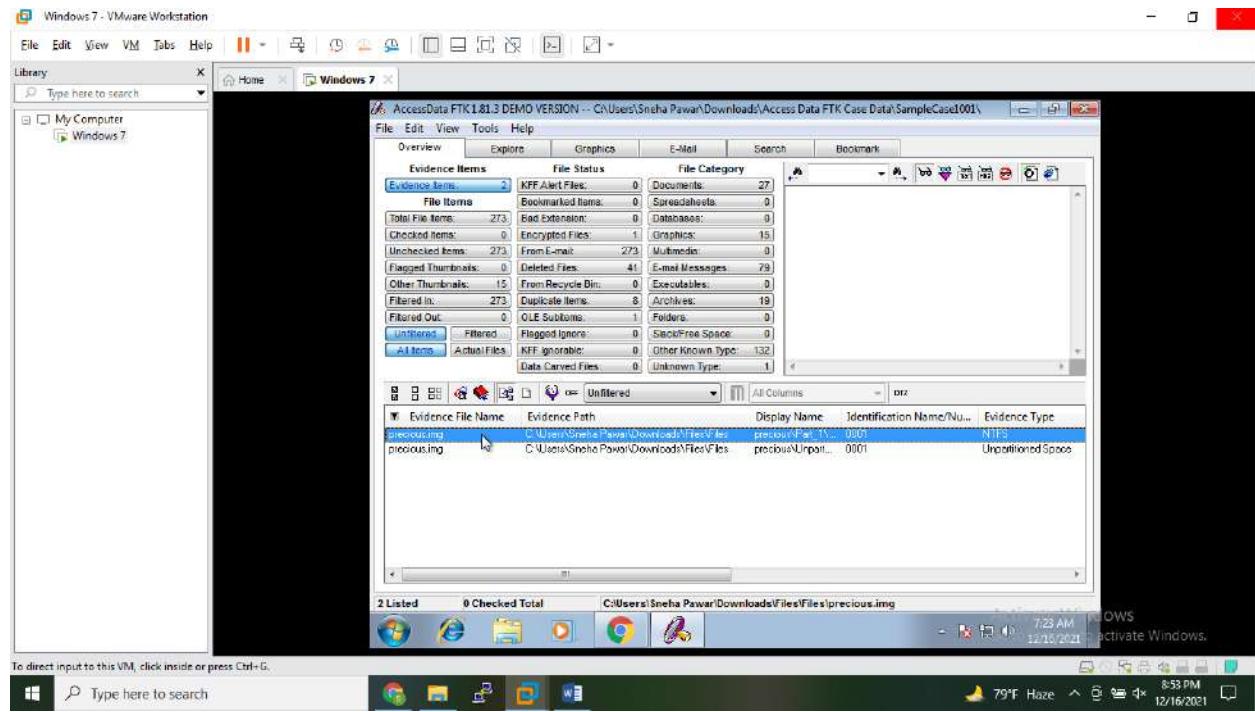




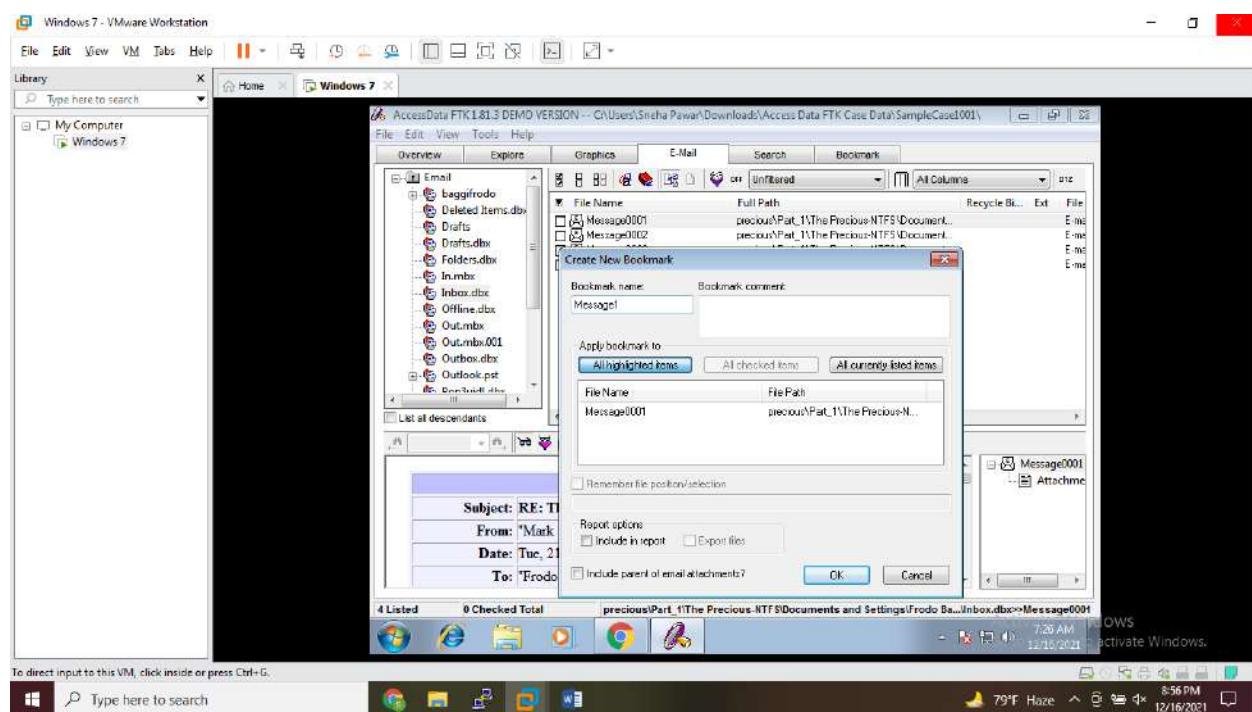
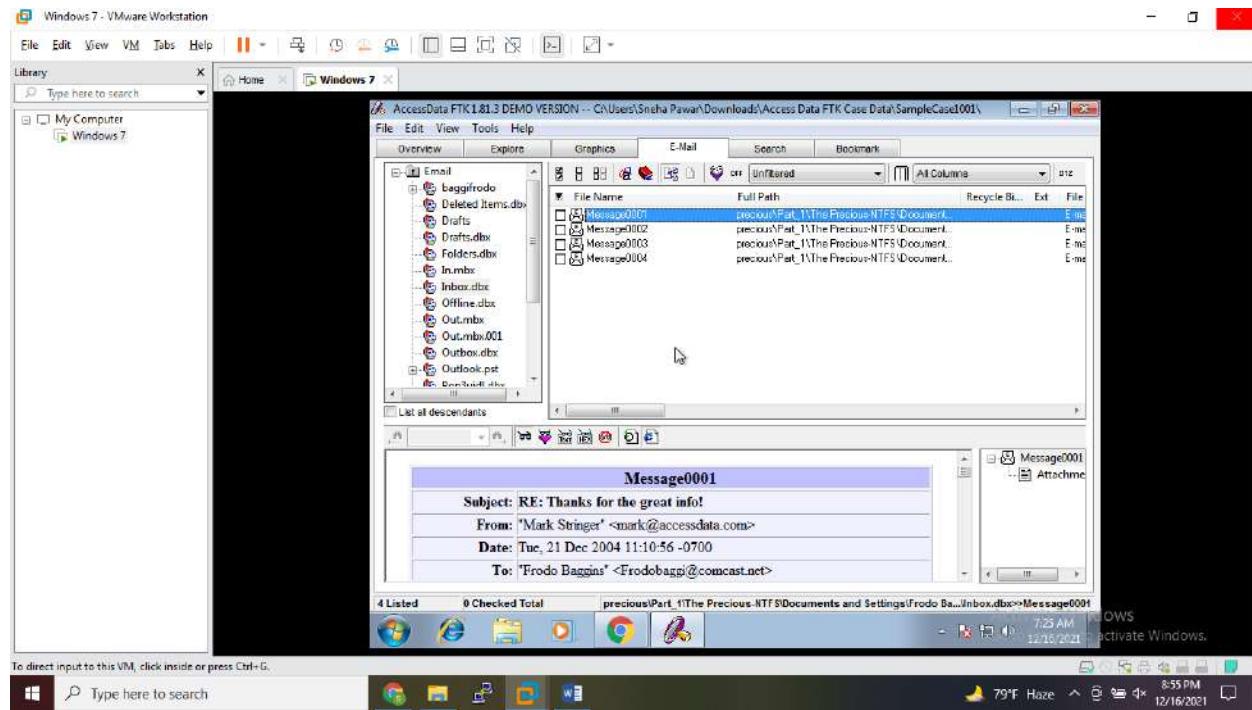


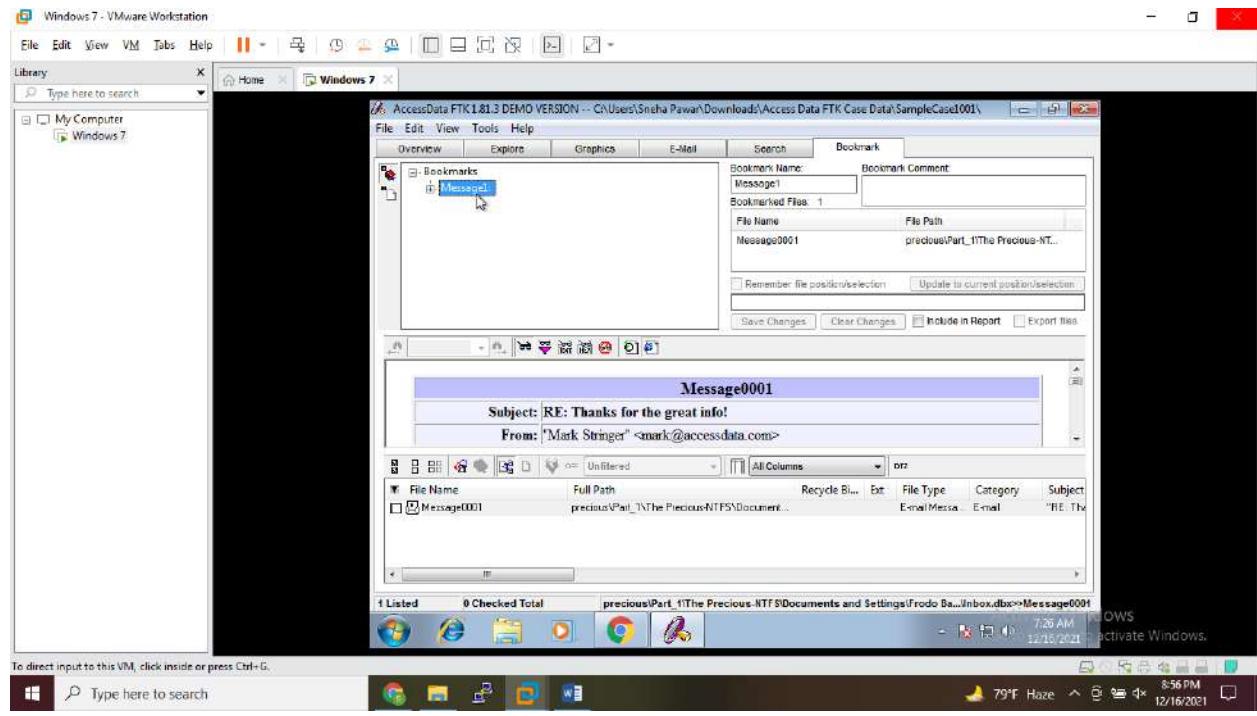






Inbox – Email





Practical No. 09

Aim: Writing Reports Using FTK [AccessData FTK].

What is AccessData FTK Tool?

Forensic Toolkit, or FTK, is a computer forensics software made by AccessData. It **scans a hard drive looking for various information**. It can, for example, potentially locate deleted emails and scan a disk for text strings to use them as a password dictionary to crack encryption.

FTK provides an **intuitive interface for email analysis** for forensic professionals. This includes having the ability to parse emails for certain words, header analysis for source IP address, etc. A central feature of FTK, file decryption is arguably the most common use of the software.

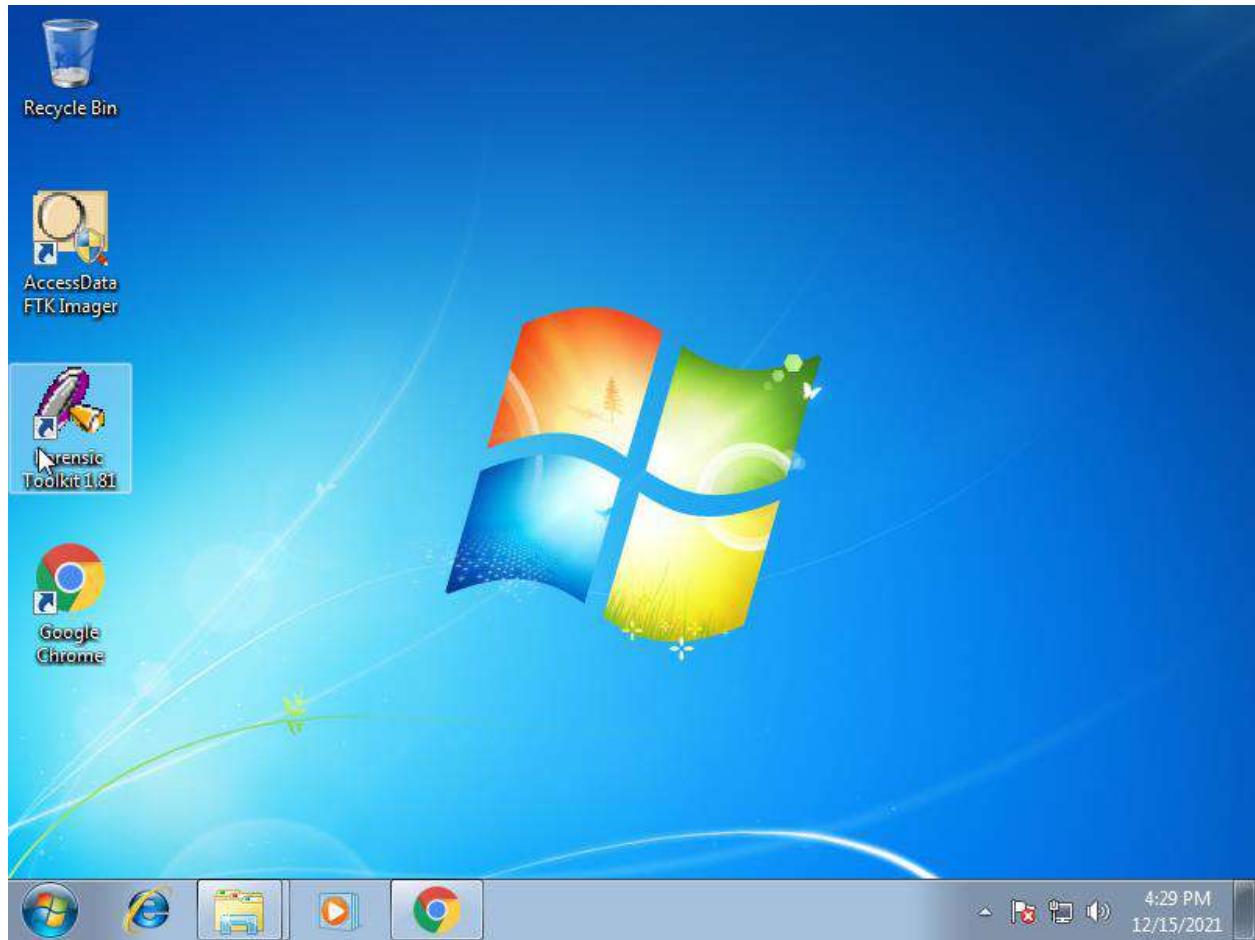
Steps:

After generating any case and adding evidences related to that case you can generate report by using the AccessData FTK tool.

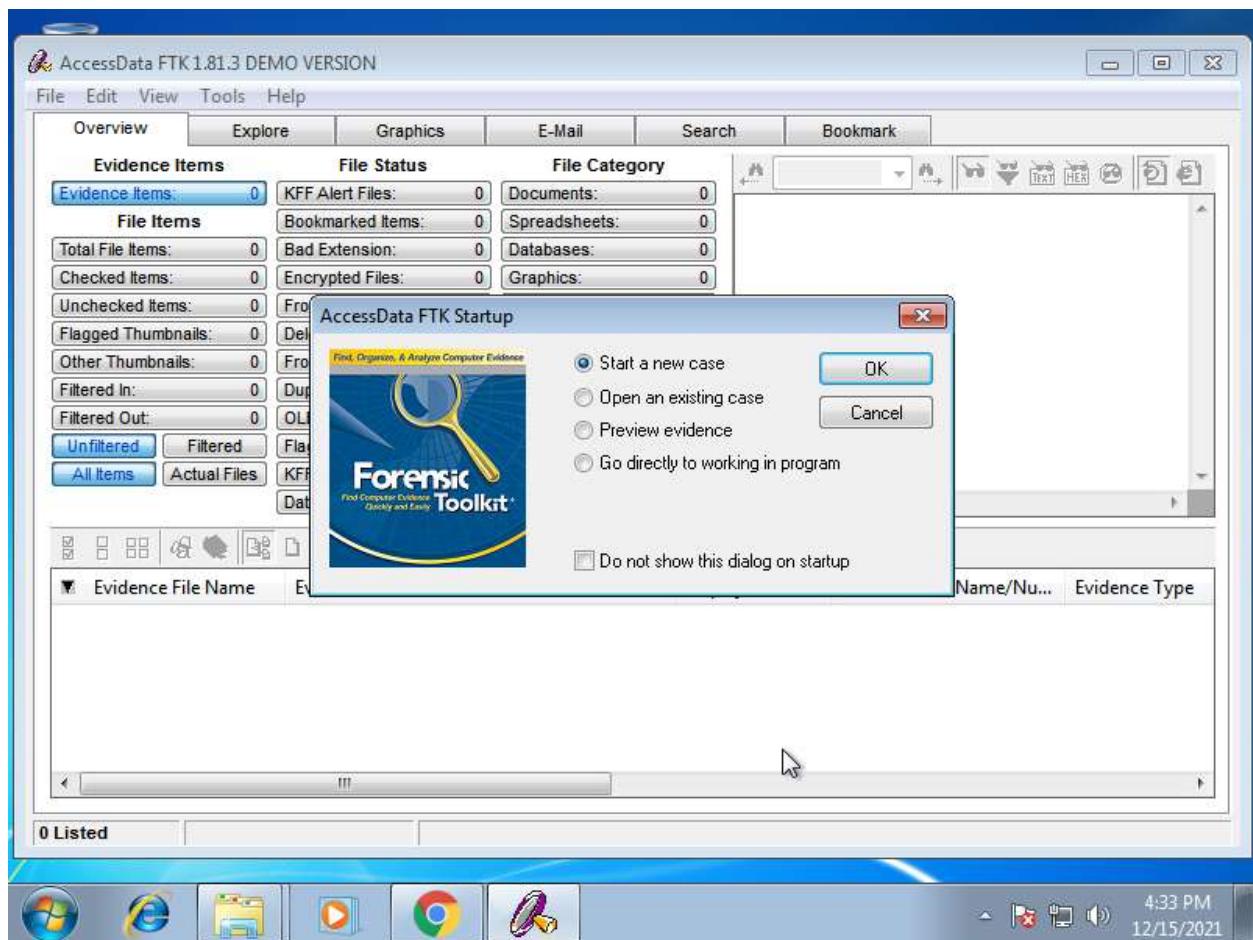
Following are the steps to create case add evidence and generate report using AccessData FTK tool.

To perform this practical you can take reference of Practical No. 08. In this I have added one case related evidences for that and generated reports for the case.

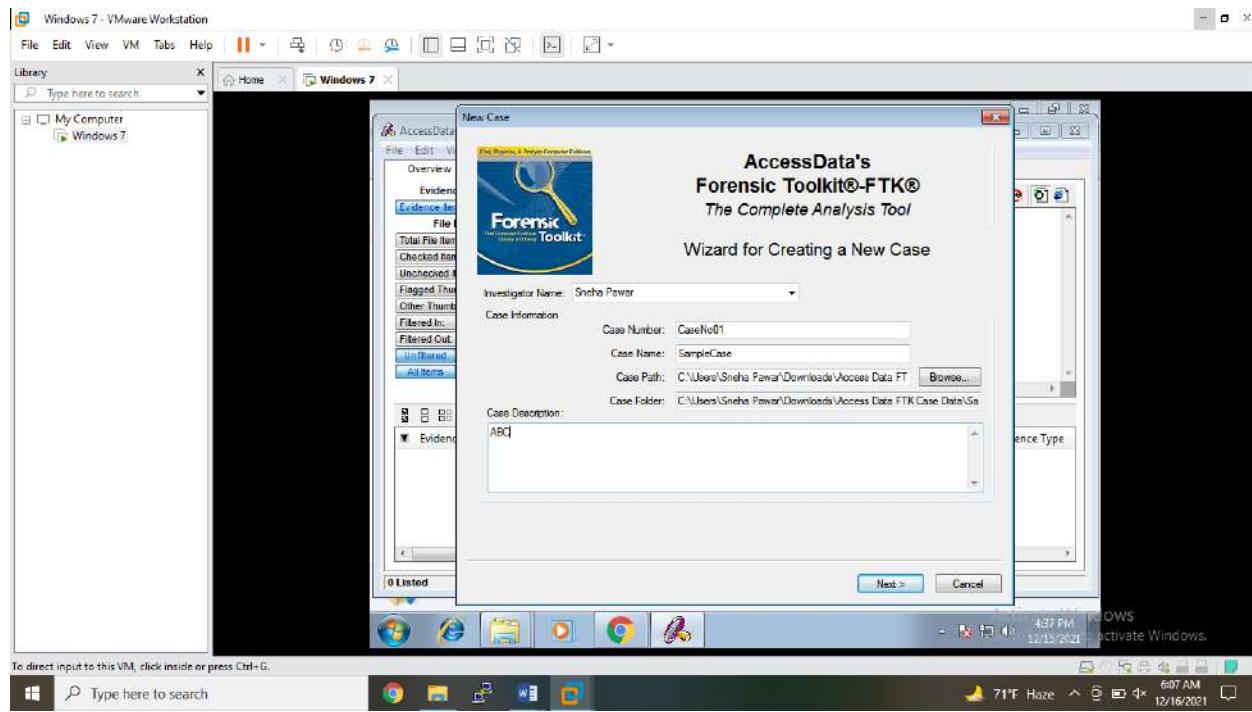
Start the forensic toolkit software.



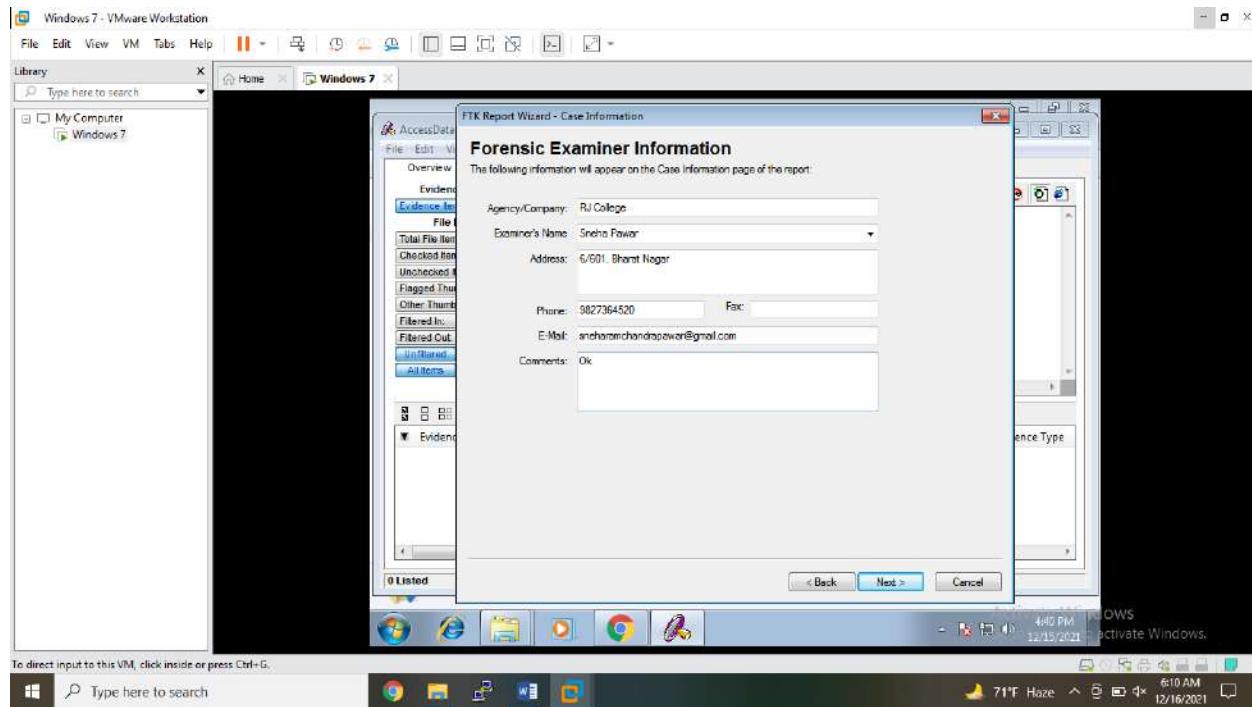
Select Start a New Case.



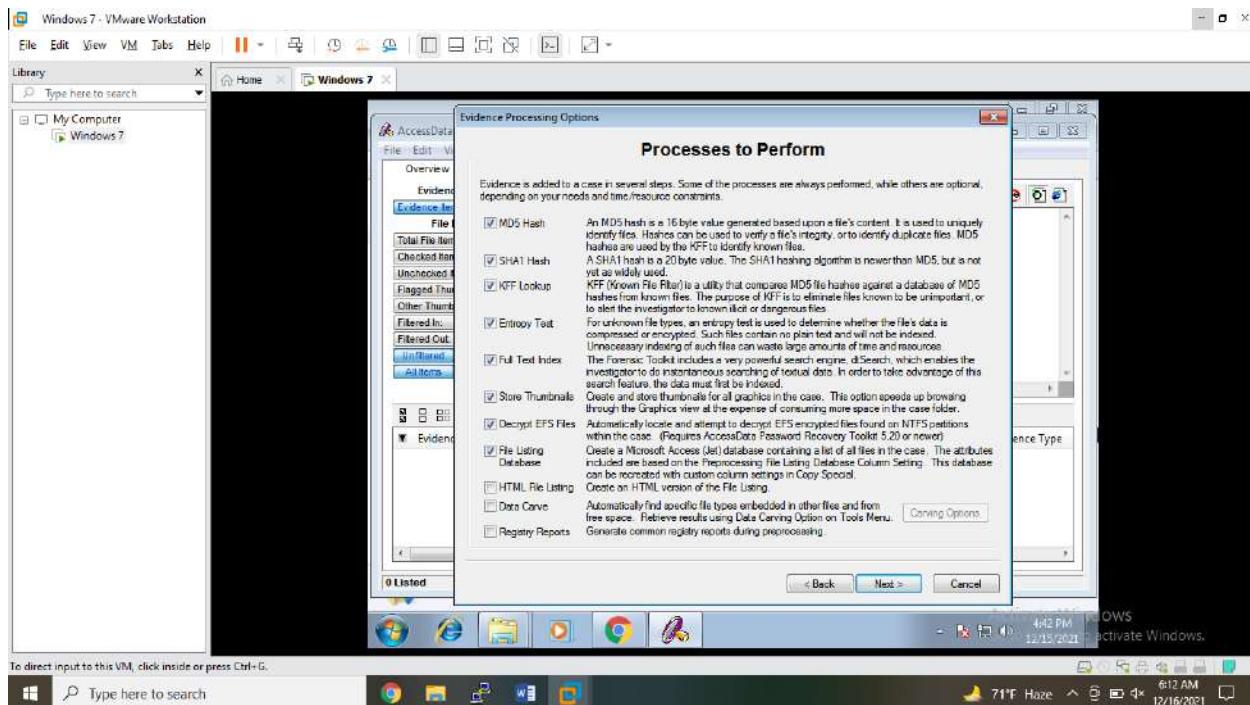
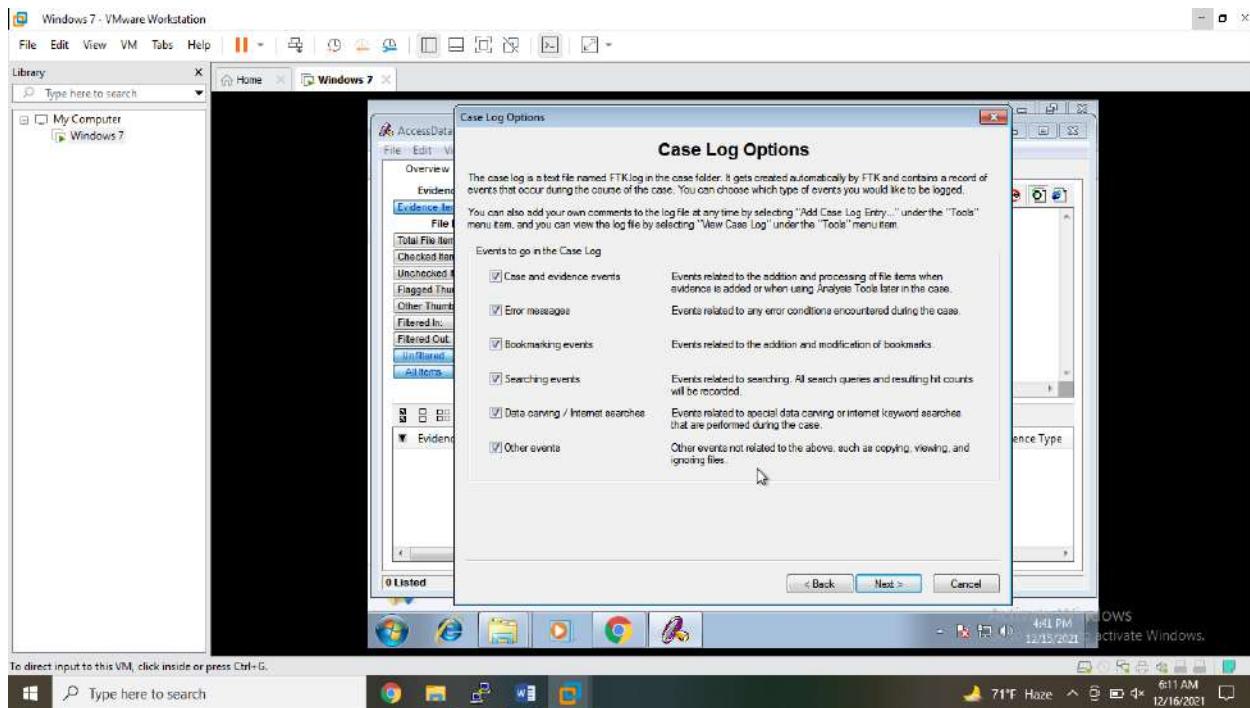
Then enter investigator's name and other details and click on Next.



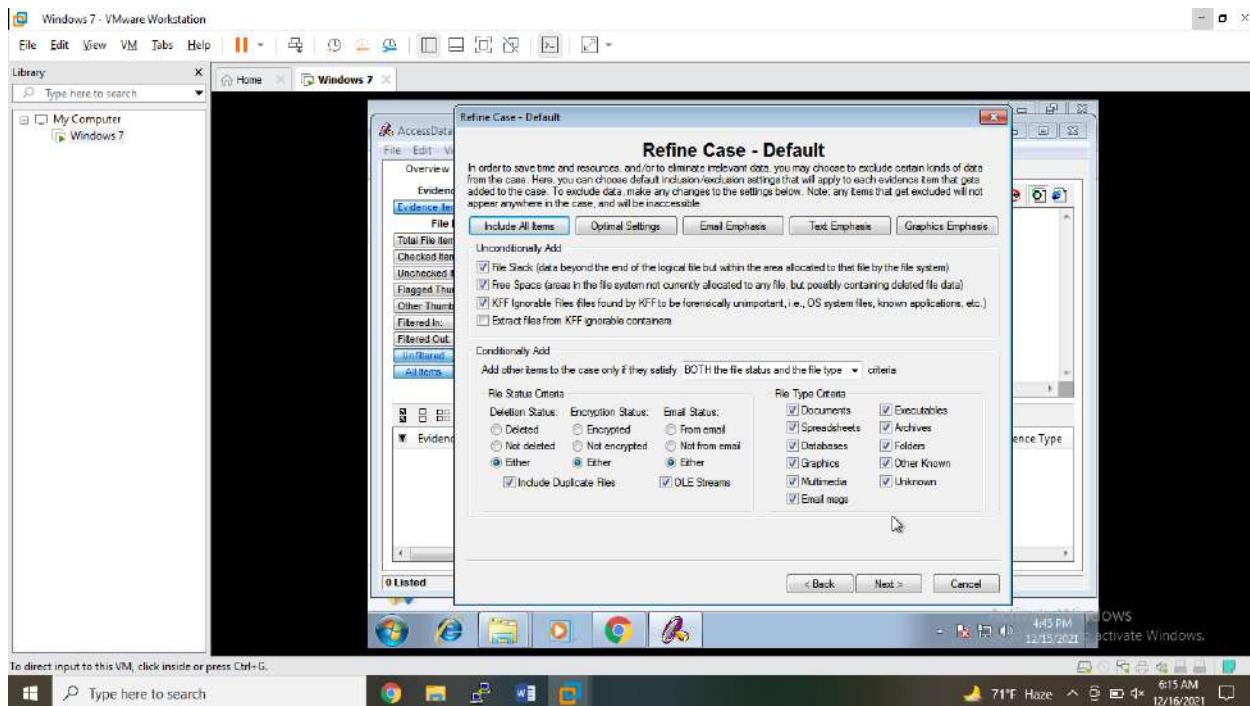
Then enter forensic examiner's details.



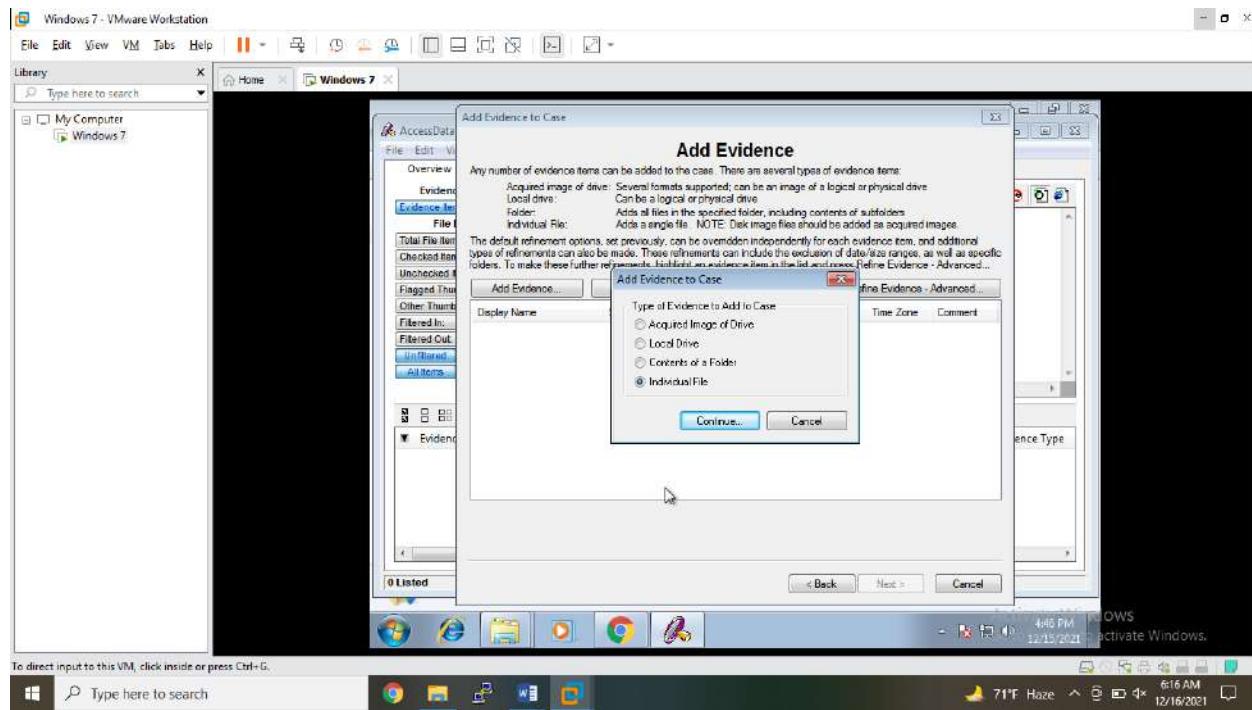
In Case Log Options & Process to perform tabs, keep everything by default.



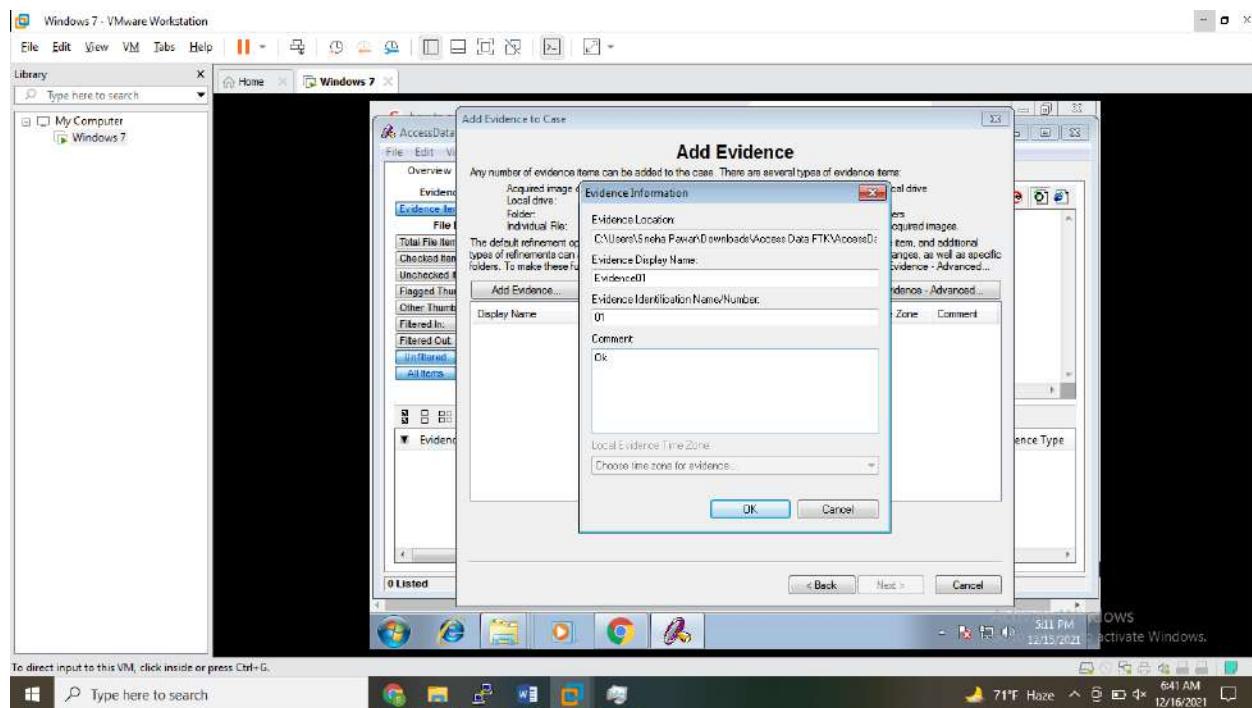
Then in Refine Case Default, Keep everything as it is, and click on Next.

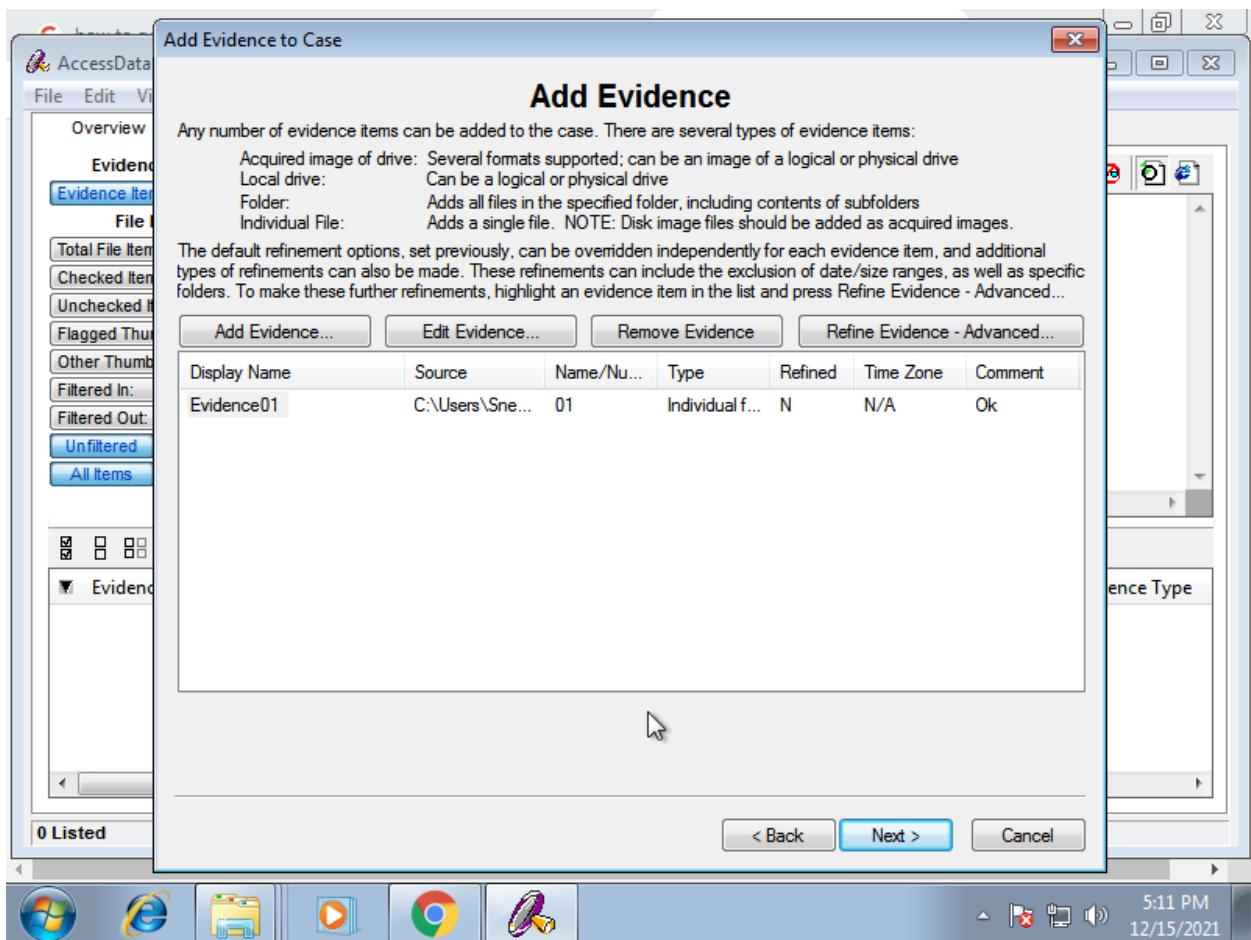


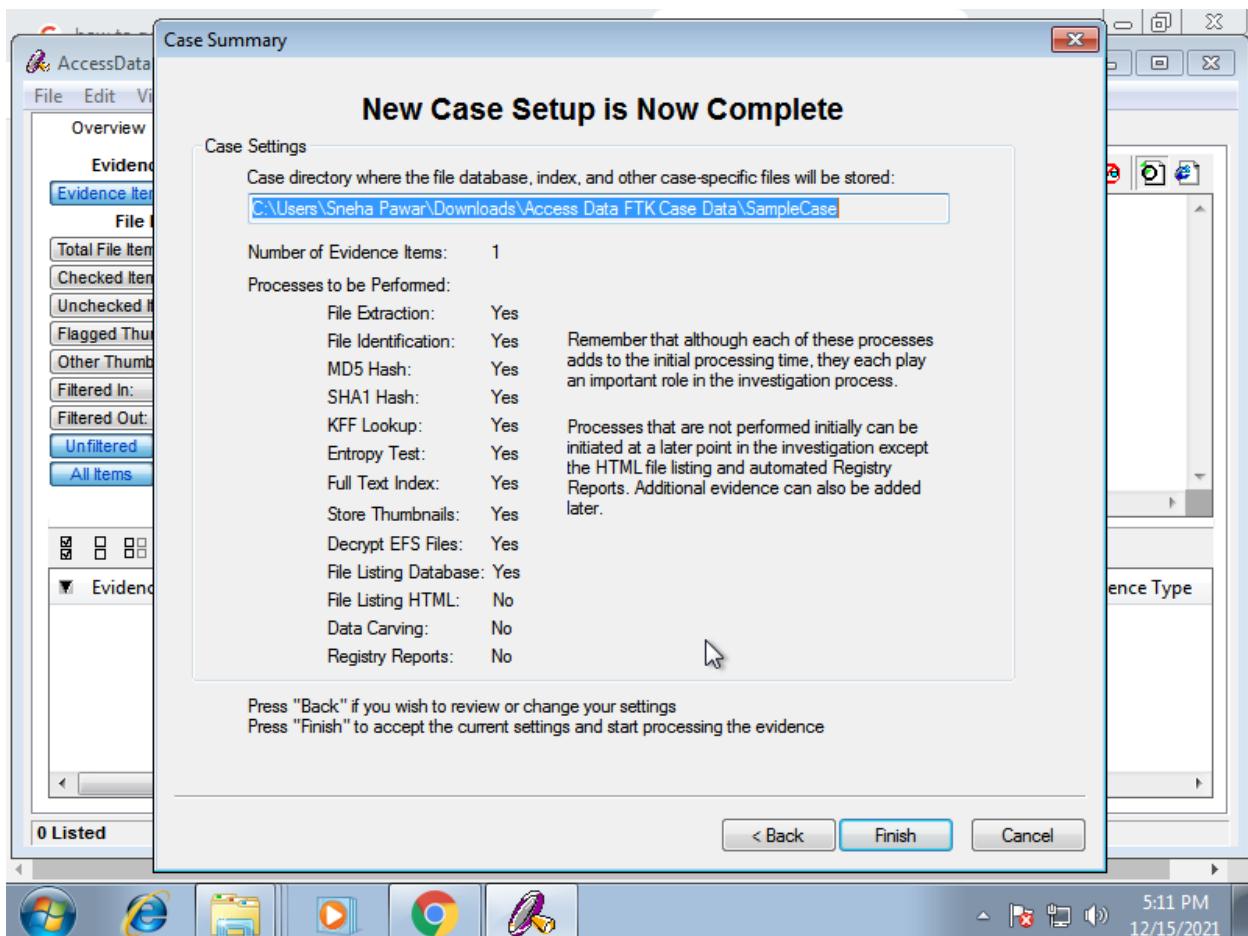
Then click on Add Evidence – Add Individual File.



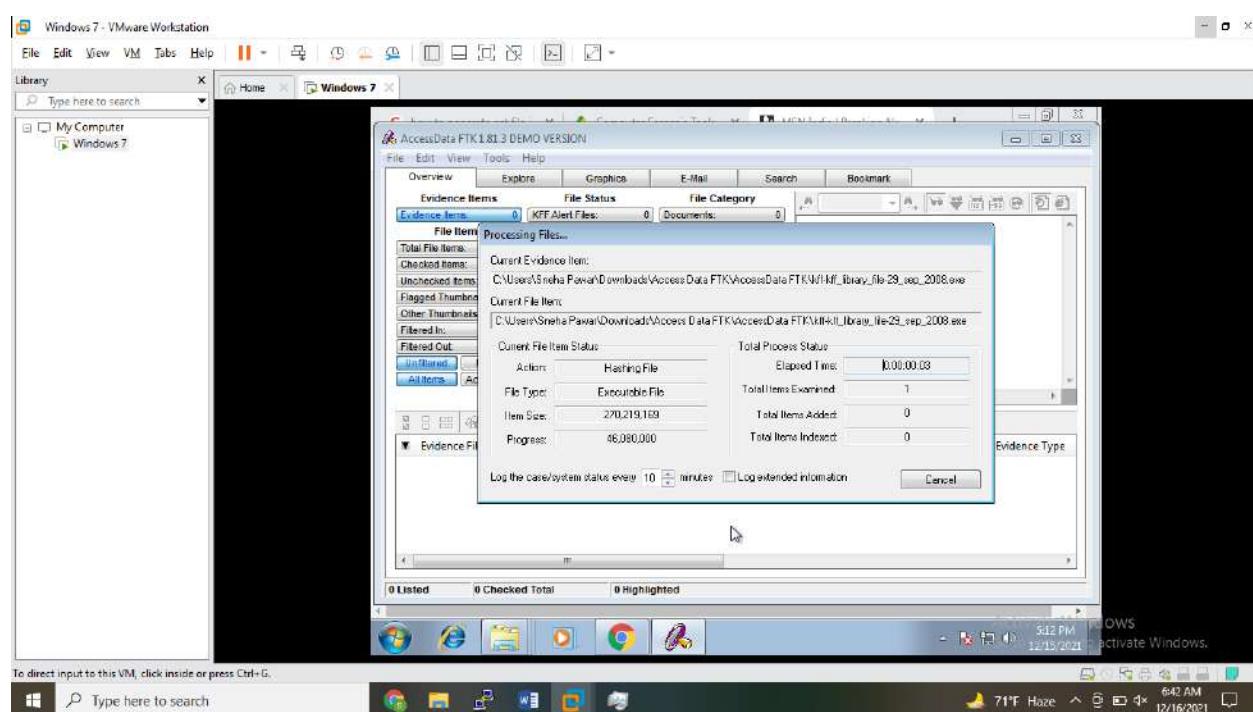
Then Browse for Evidence location, and enter other details.

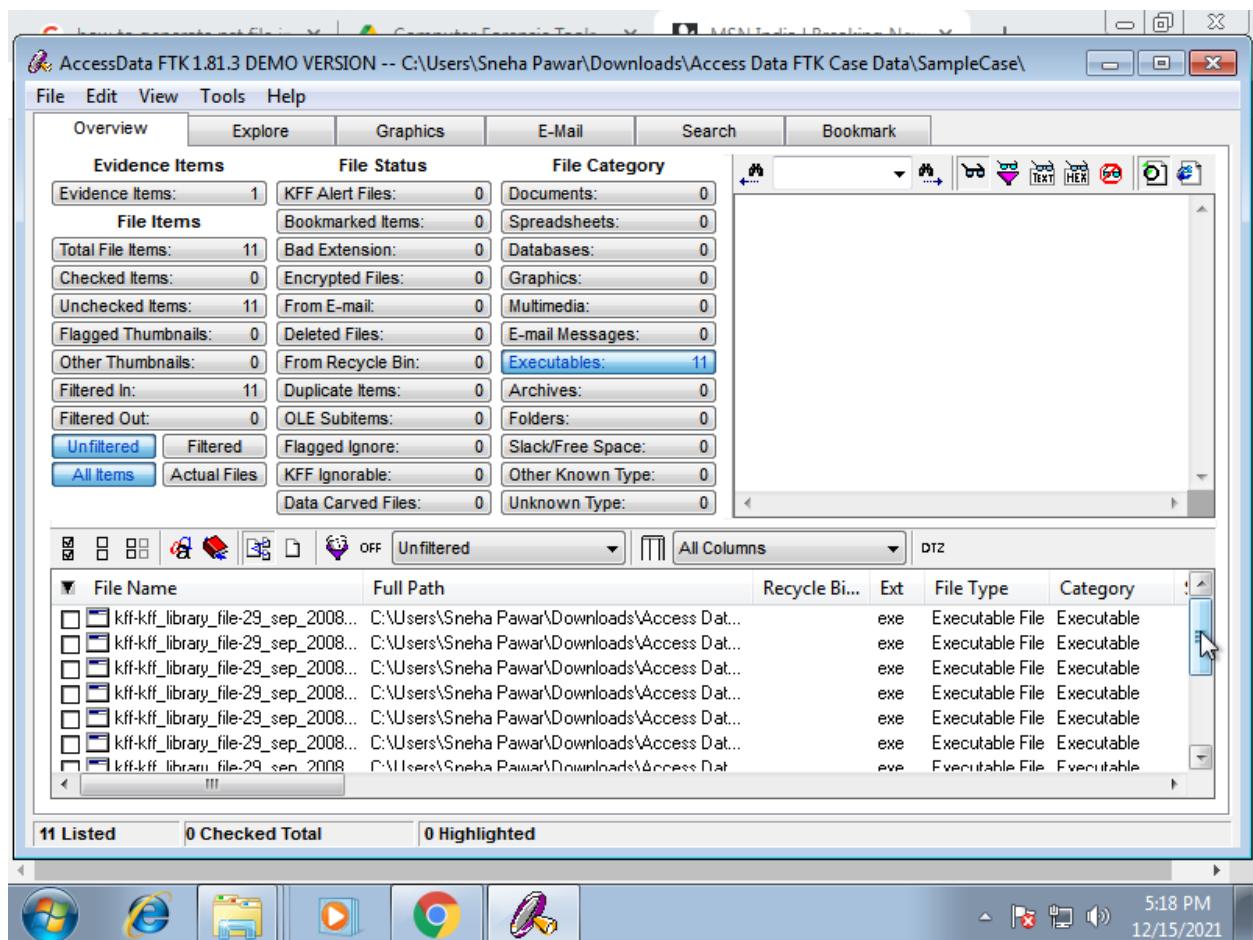
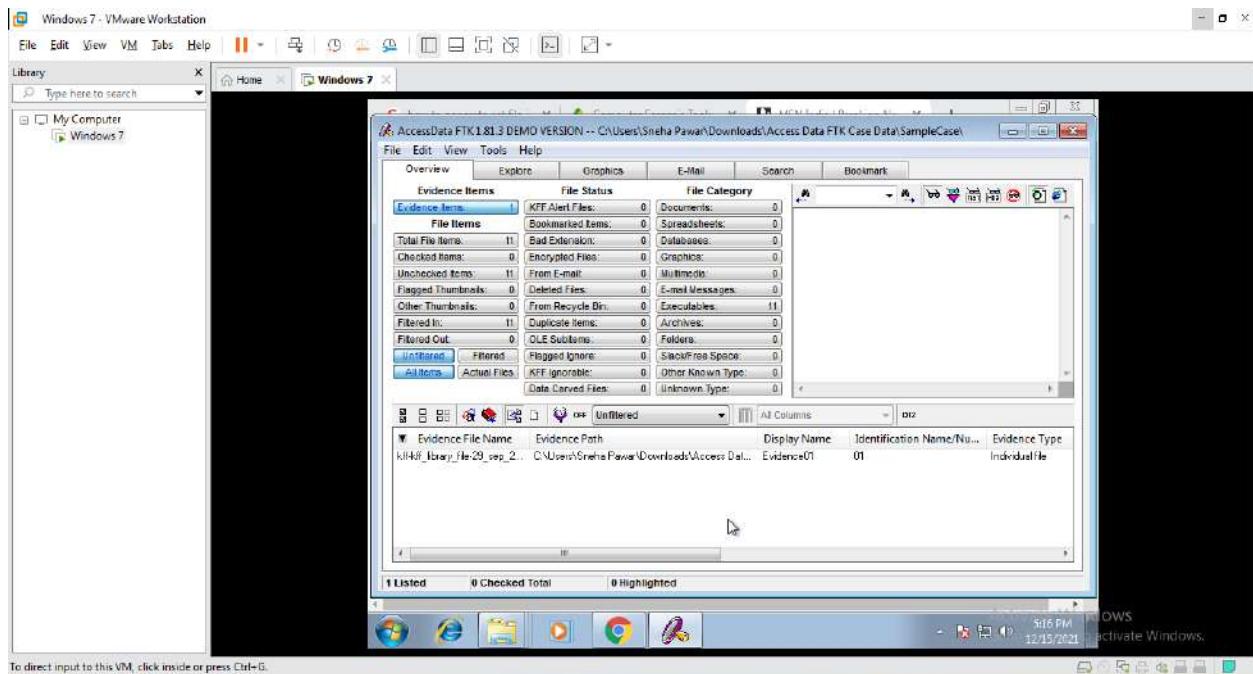




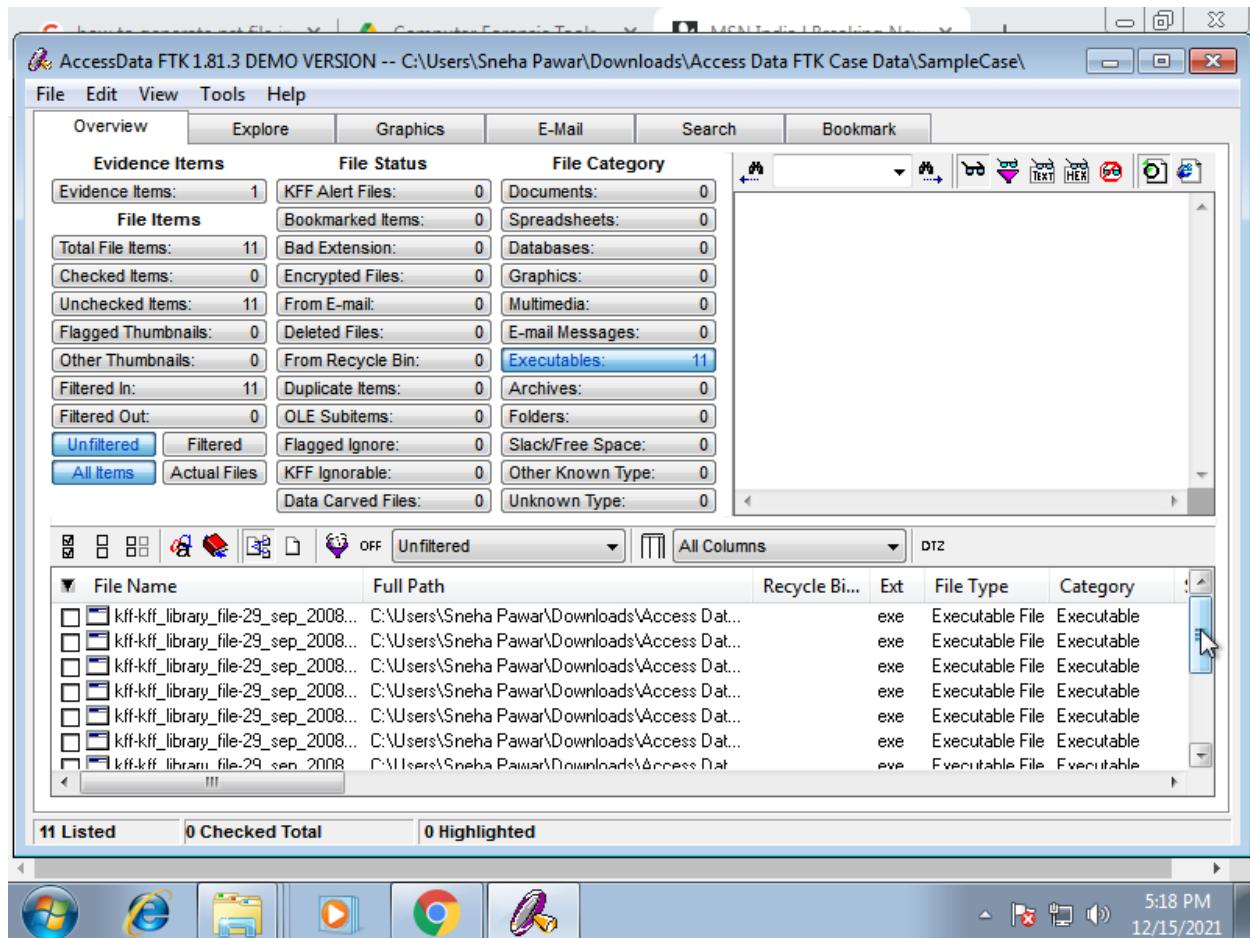


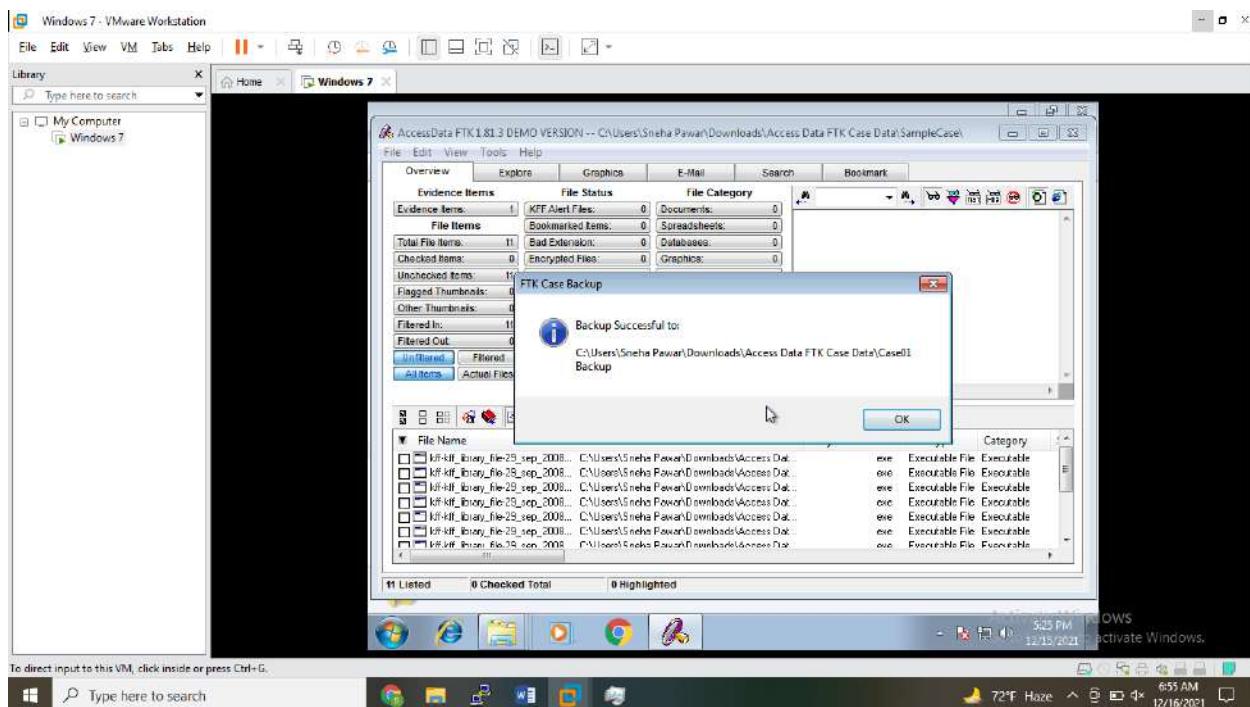
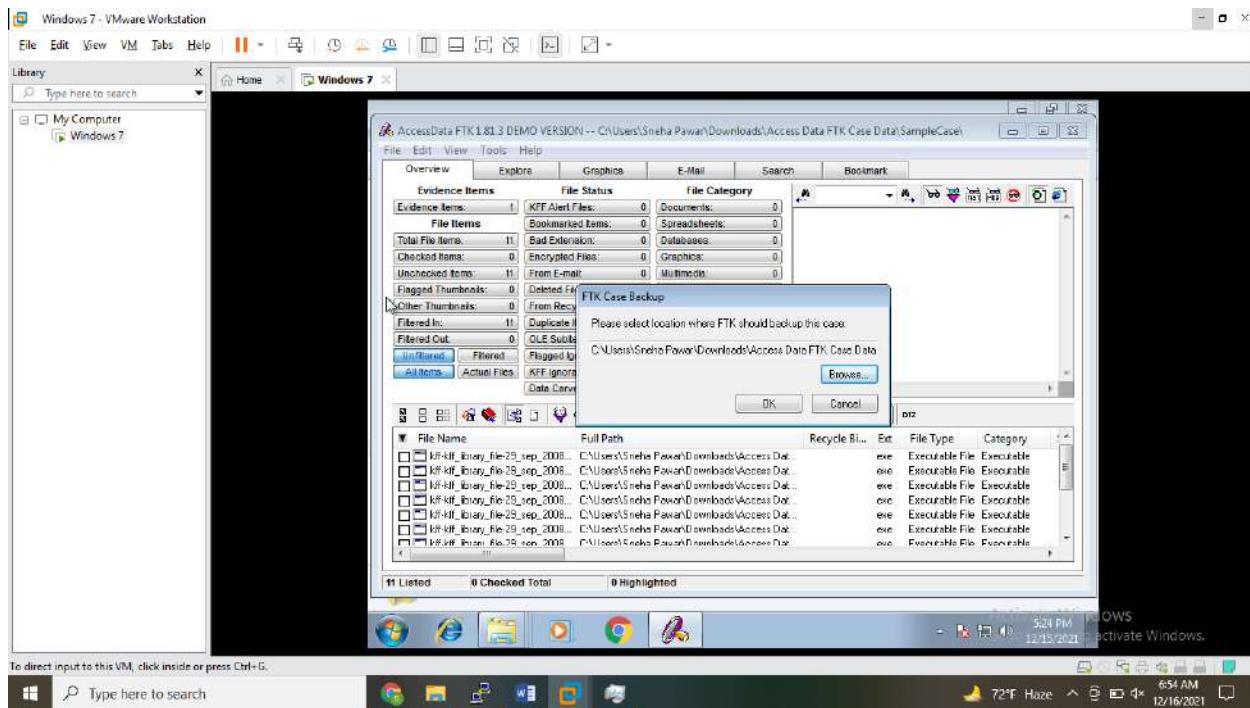
Click on Finish. It will start processing the File.





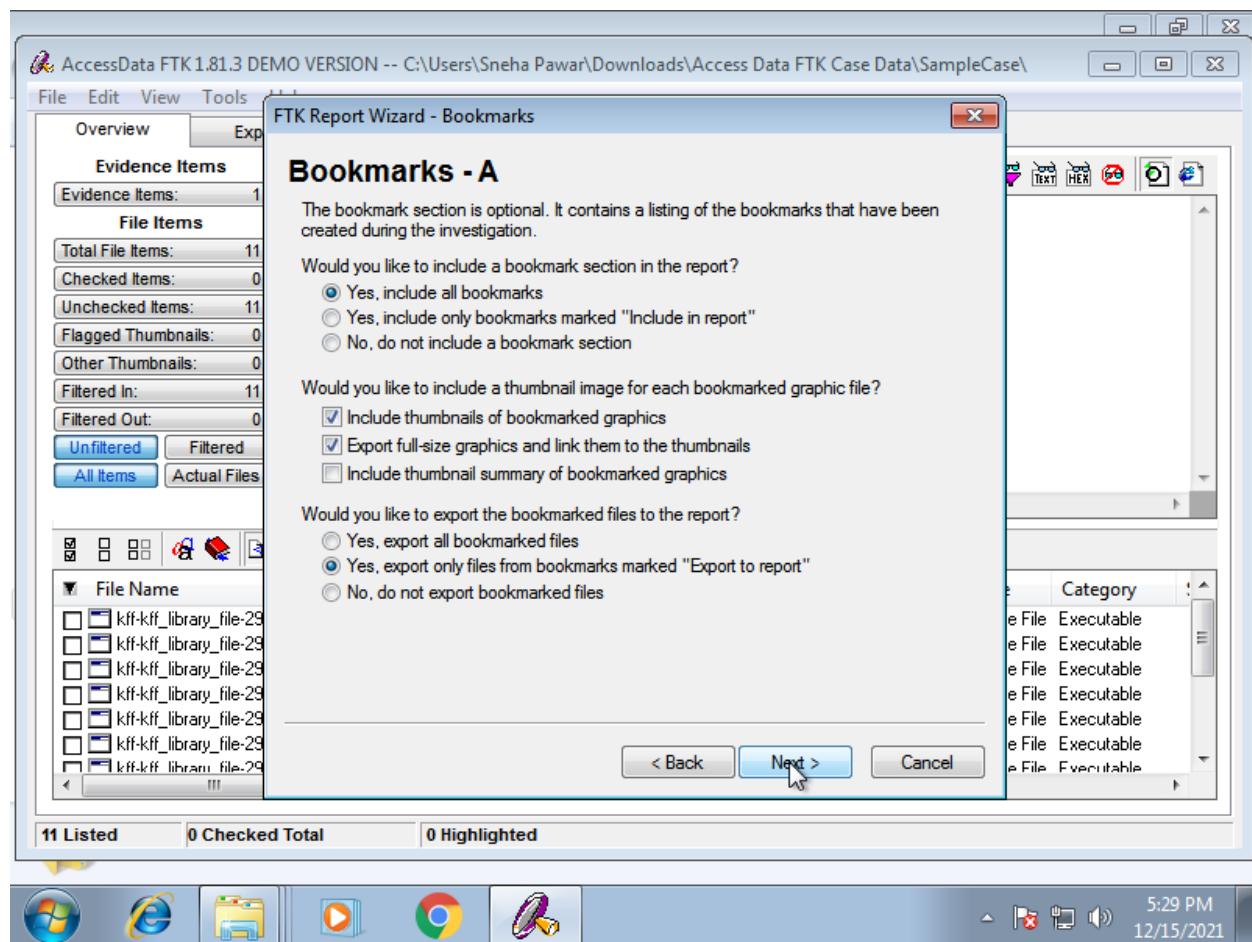
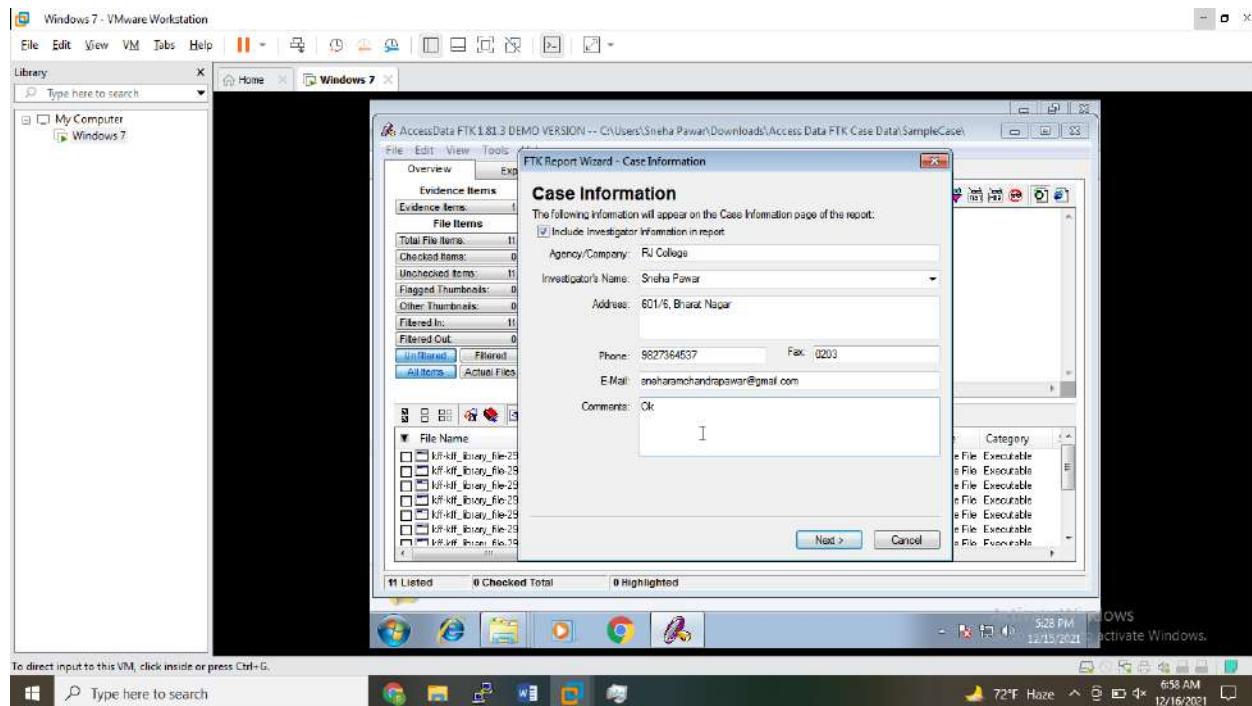
To take backup of your case, Click on File – Backup Case – And browse for location where you want to take backup.





Then click on File - Report Wizard.

Fill the details. And click on Next.



AccessData FTK 1.81.3 DEMO VERSION -- C:\Users\Sneha Pawar\Downloads\Access Data FTK Case Data\SampleCase

File Edit View Tools

FTK Report Wizard - Bookmarks

Bookmarks - B

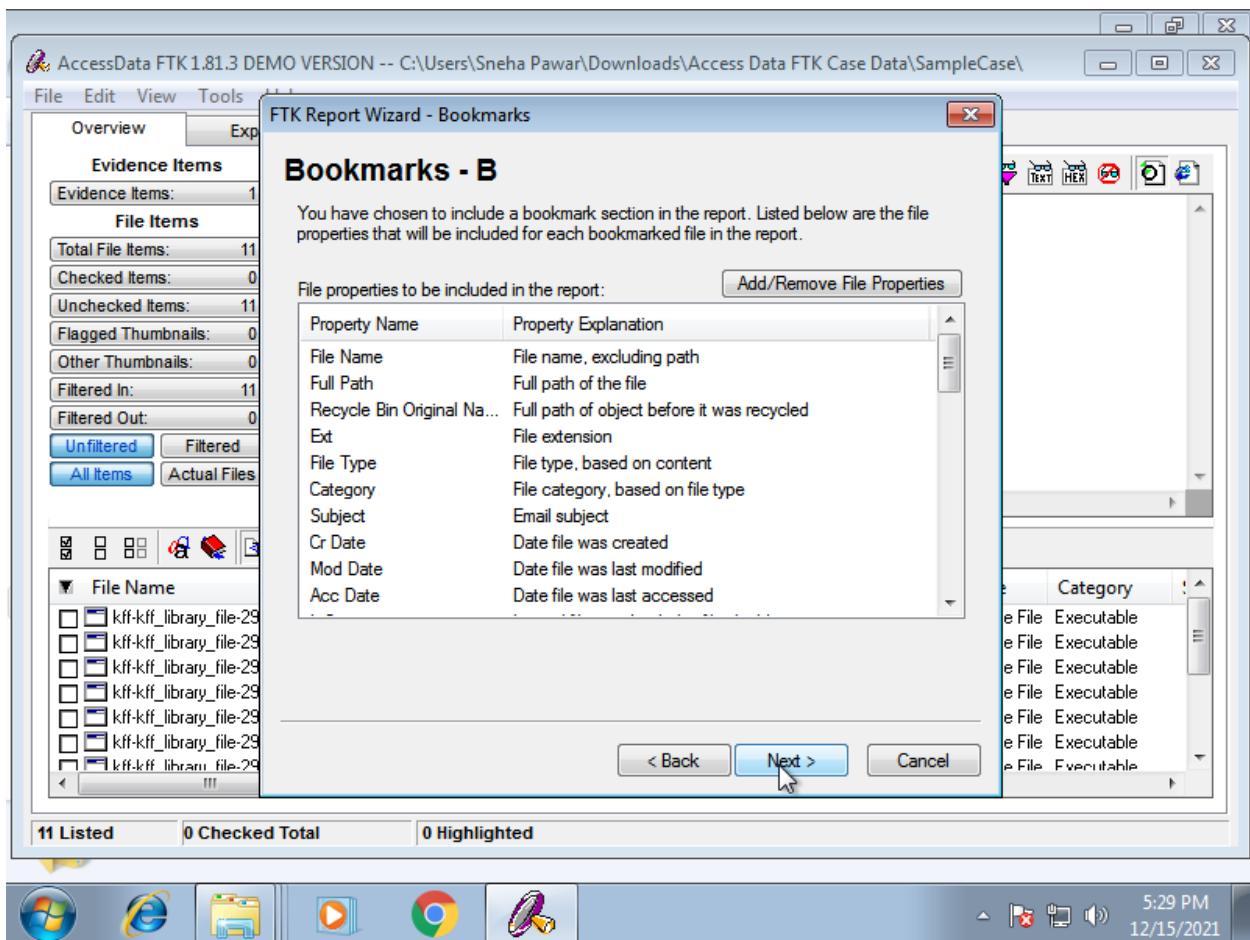
You have chosen to include a bookmark section in the report. Listed below are the file properties that will be included for each bookmarked file in the report.

File properties to be included in the report: [Add/Remove File Properties](#)

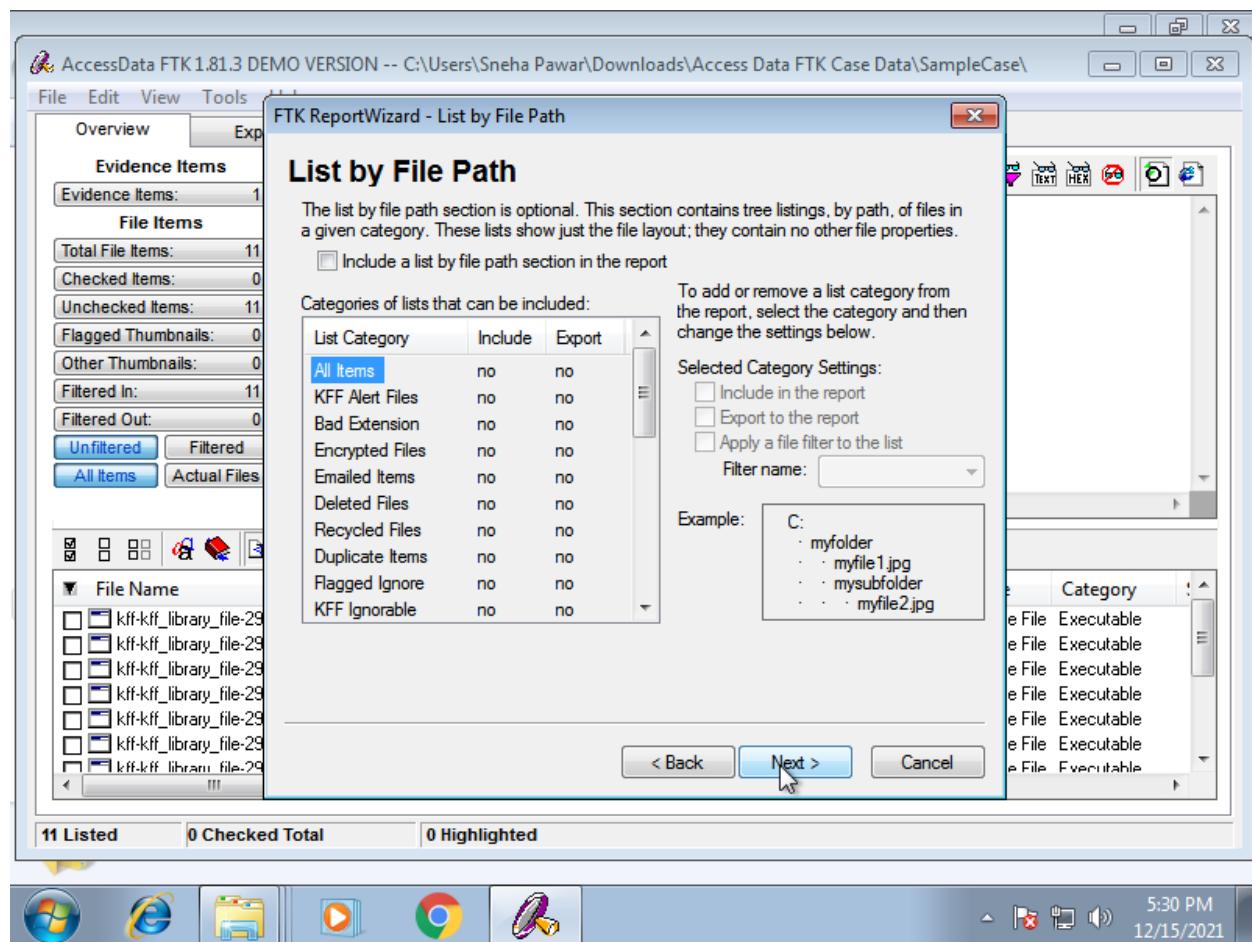
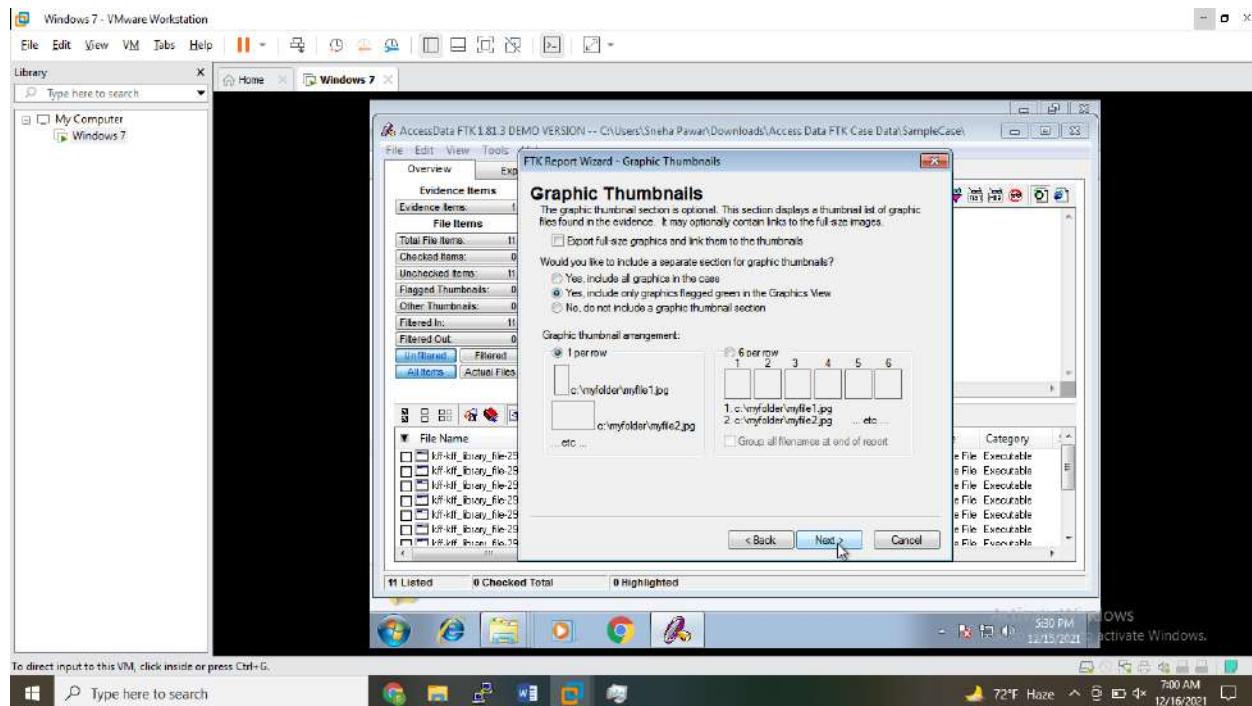
Property Name	Property Explanation
File Name	File name, excluding path
Full Path	Full path of the file
Recycle Bin Original Na...	Full path of object before it was recycled
Ext	File extension
File Type	File type, based on content
Category	File category, based on file type
Subject	Email subject
Cr Date	Date file was created
Mod Date	Date file was last modified
Acc Date	Date file was last accessed

< Back [Next >](#) Cancel

11 Listed 0 Checked Total 0 Highlighted



5:29 PM
12/15/2021



AccessData FTK 1.81.3 DEMO VERSION -- C:\Users\Sneha Pawar\Downloads\Access Data FTK Case Data\SampleCase

File Edit View Tools

Evidence Items

Evidence Items: 1

File Items

Total File Items: 11
Checked Items: 0
Unchecked Items: 11
Flagged Thumbnails: 0
Other Thumbnails: 0
Filtered In: 11
Filtered Out: 0
Unfiltered Filtered
All Items Actual Files

Include a list file properties section in the report
 Include MS Access database in report

Categories of lists to be included in the report:

List Category	Include	Export
All Items	no	no
KFF Alert Files	no	no
Bad Extension	no	no
Encrypted Files	no	no
Emailed Items	no	no
Deleted Files	no	no
Recycled Files	no	no
Duplicate Items	no	no
Flagged Ignore	no	no
KFF Ignorable	no	no

To add or remove a list category from the report, select the category and then change its settings below.

Selected Category Settings:

- Include in the report
- Export to the report
- Apply a file filter to the list

Filter name:

Example:

```
File: myfile1.jpg
Path: C:\myfolder
File Type: JPEG/JFIF File
Category: Graphic
L-Size: 37942
```

< Back Next > Cancel

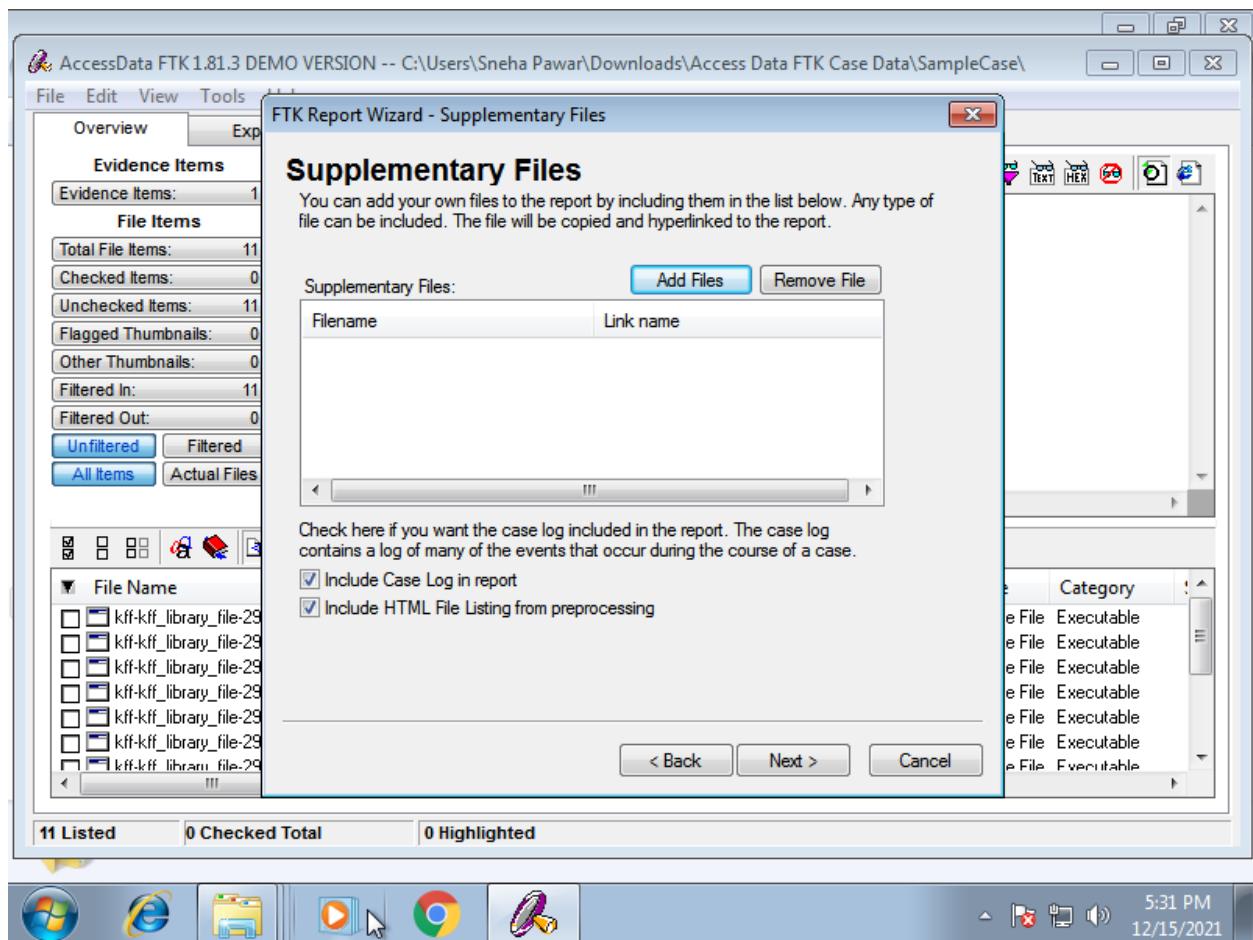
11 Listed 0 Checked Total 0 Highlighted

Category

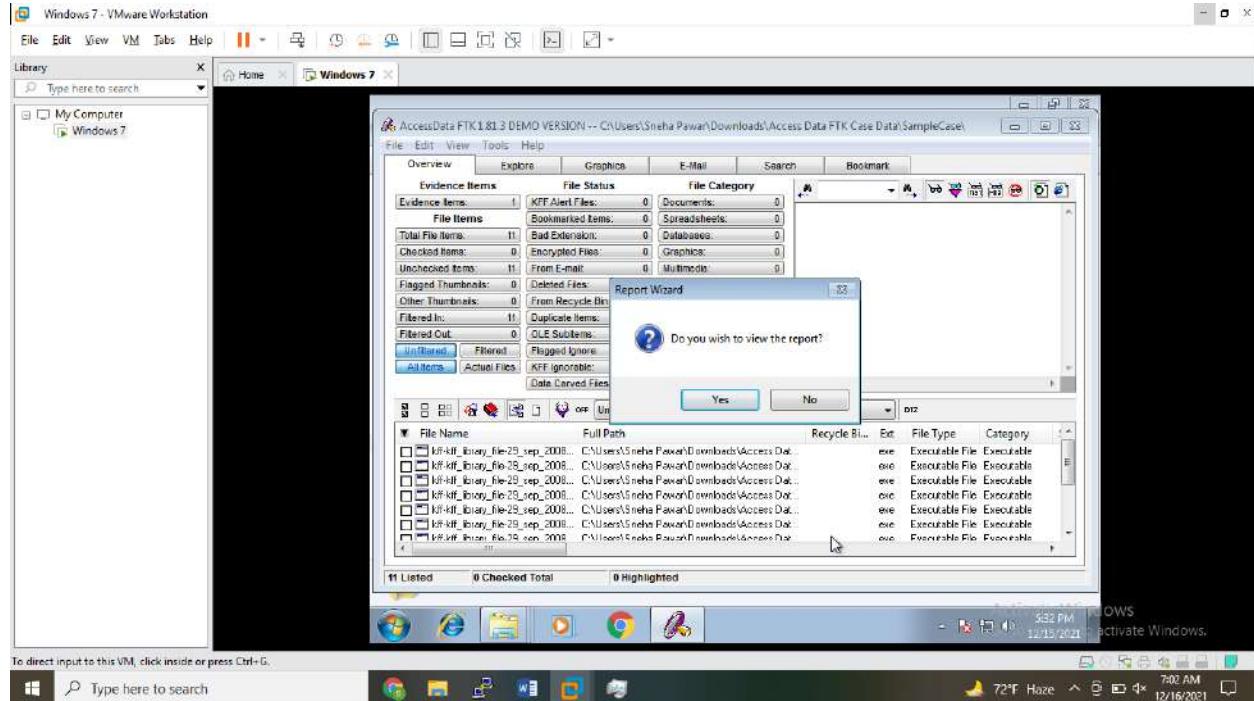
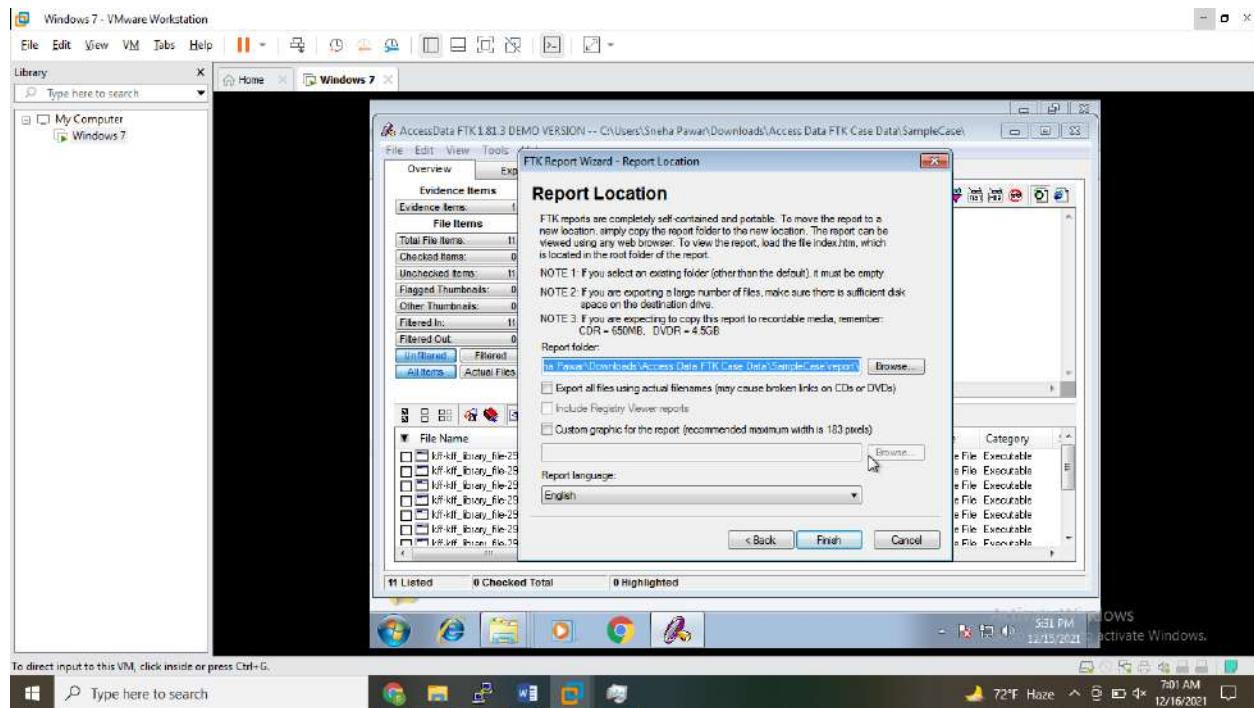
e File Executable
e File Executable

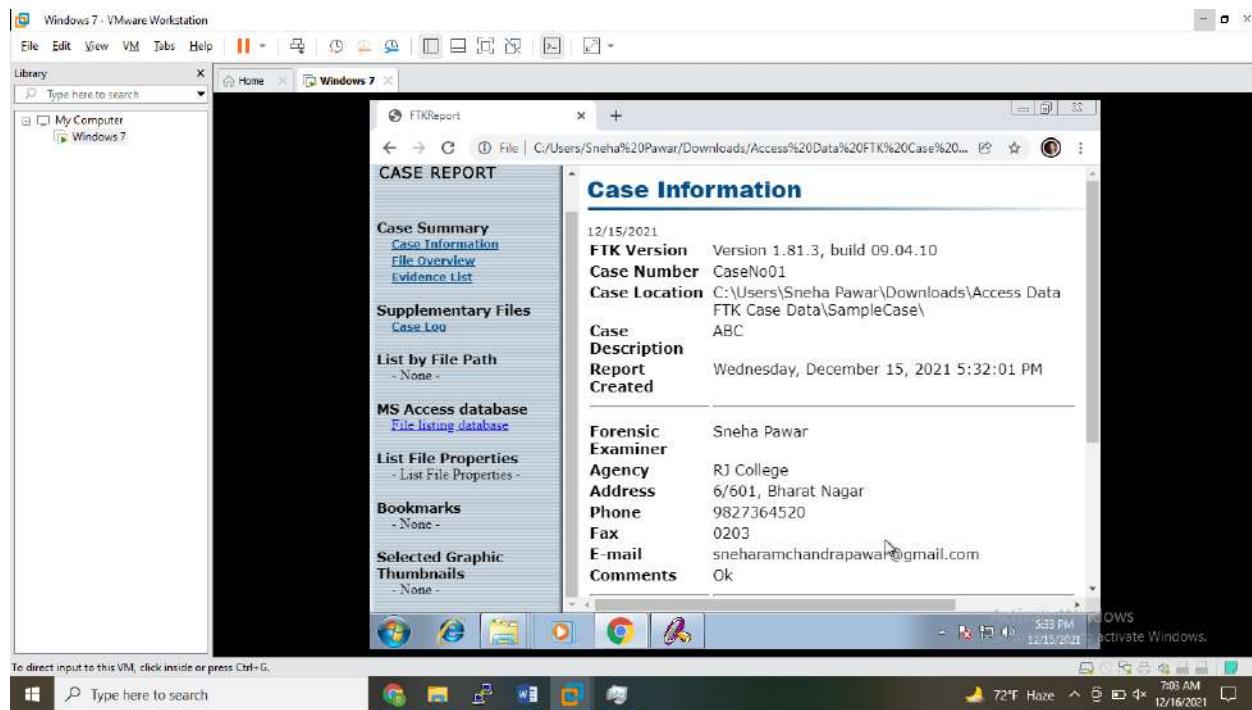


5:30 PM
12/15/2021



Enter report location.





FTKReport

File | C:/Users/Sneha%20Pawar/Downloads/Access%20Data%20FTK%20Case%20...

CASE REPORT

Evidence List

12/15/2021

Display Name: Evidence01

Evidence File Name: kff-kff_library_file-29_sep_2008.exe

Evidence Path: C:\Users\Sneha Pawar\Downloads\Access Data FTK\AccessData FTK

Identification Name/Number: 01

Evidence Type: Individual file

Added: 12/15/2021 5:12:15 PM

Children: 0

Descendants: 0

Comment: Ok

AccessData Forensic Toolkit®

List by File Path
- None -

MS Access database
[File listing database](#)

List File Properties
- List File Properties -

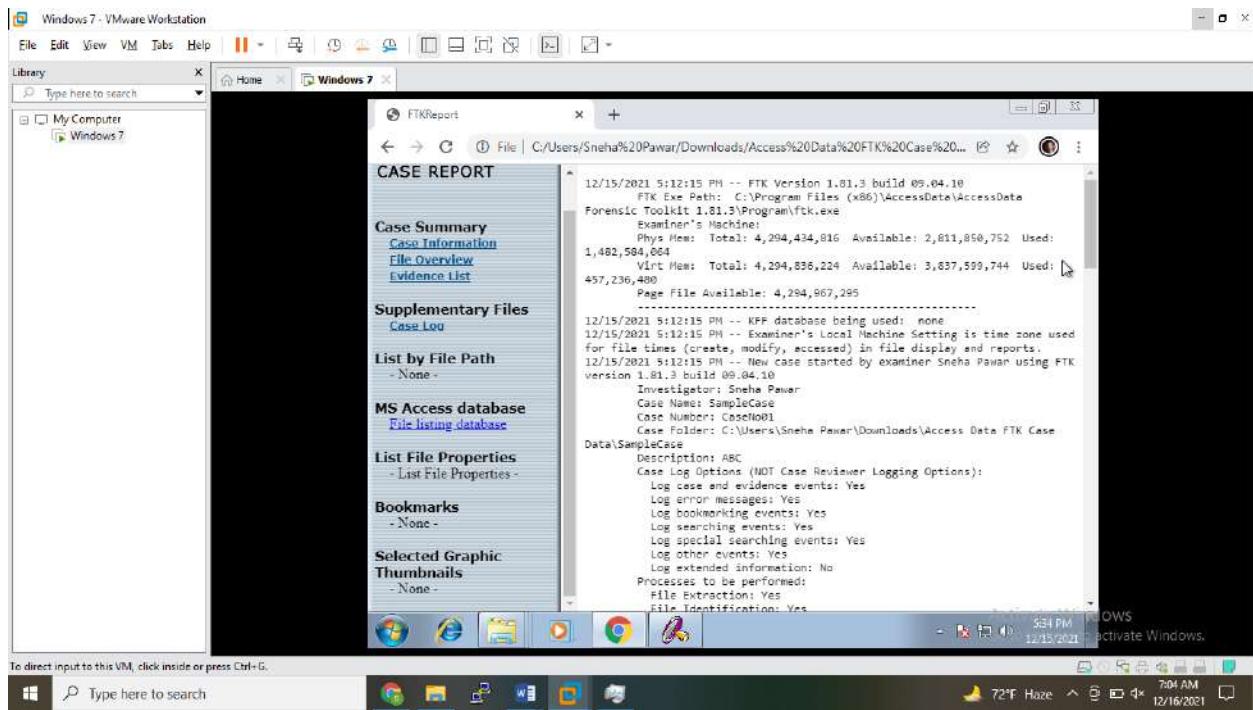
Bookmarks
- None -

Selected Graphic Thumbnails
- None -



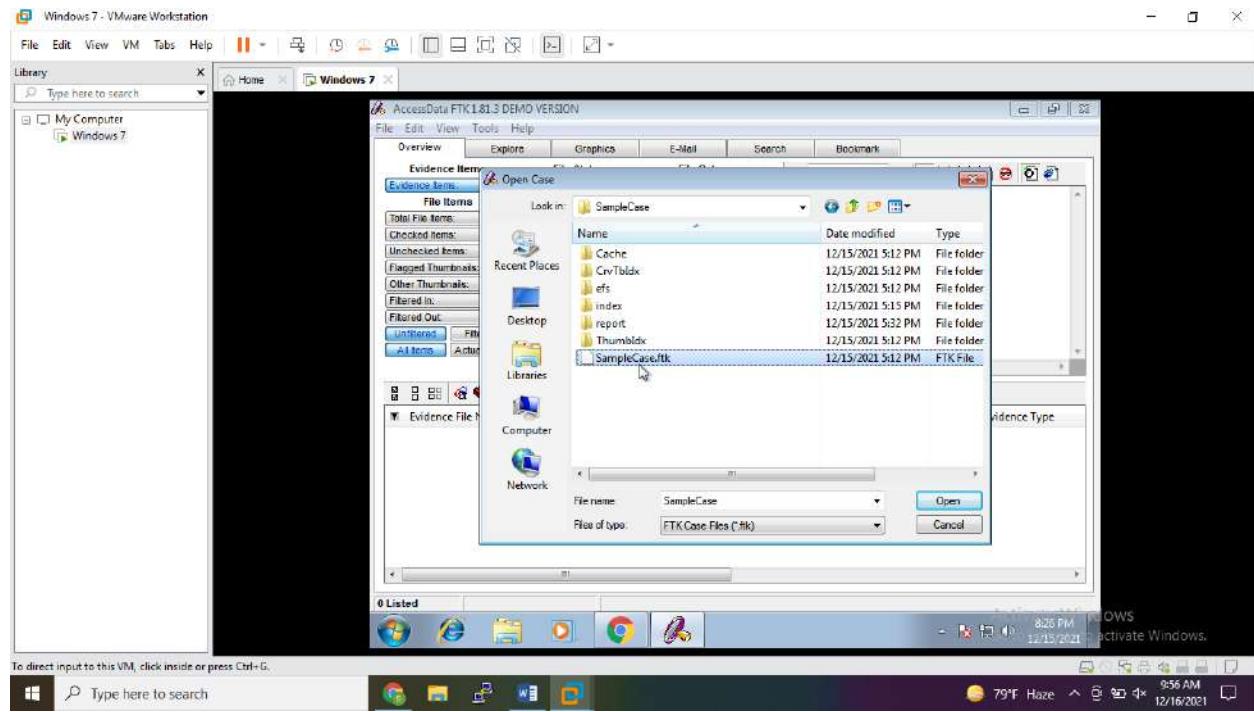
5:38 PM
12/15/2021

The screenshot shows a Windows 7 desktop environment within a VMware Workstation window. The main application is FTKReport, with the 'File Overview' tab selected. The interface includes a sidebar with links for Case Summary, Evidence Items, File Items, and File Status. The main pane displays file statistics: 12/15/2021, Evidence Items: 1, File Items: Total File Items: 11, Flipped Thumbnails: 0, Other Thumbnails: 0, and File Status: KFF Alert Files: 0, Bookmarked Items: 0, Bad Extension: 0, Encrypted Files: 0, From E-mail: 0, Deleted Files: 0, From Recycle Bin: 0, Duplicate Items: 0, OLE Subitems: 0, Flagged Ignored: 0, KFF Ignorable: 0, Data Carved Files: 0. The taskbar at the bottom shows the date and time as 5:54 PM on 12/15/2021, and the system tray has a message about activating Windows.



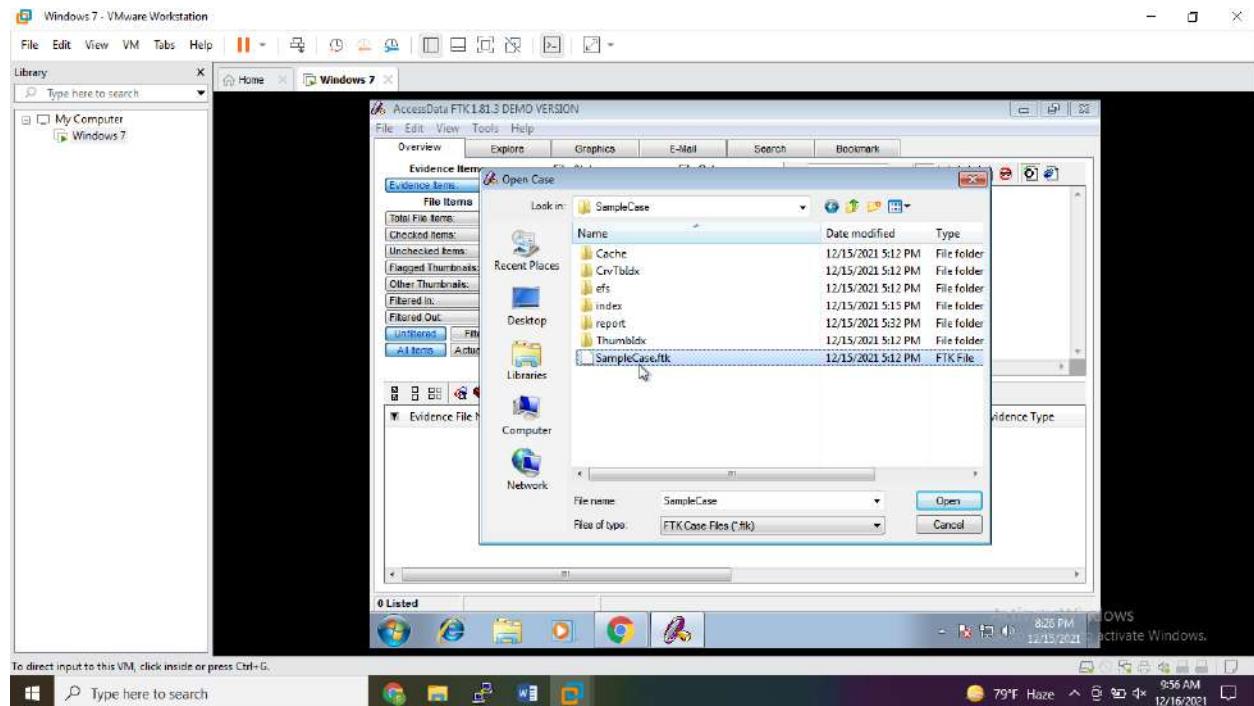
Now, let's perform Email Forensic on this. Open Existing Case that we have created.

File – Open Case

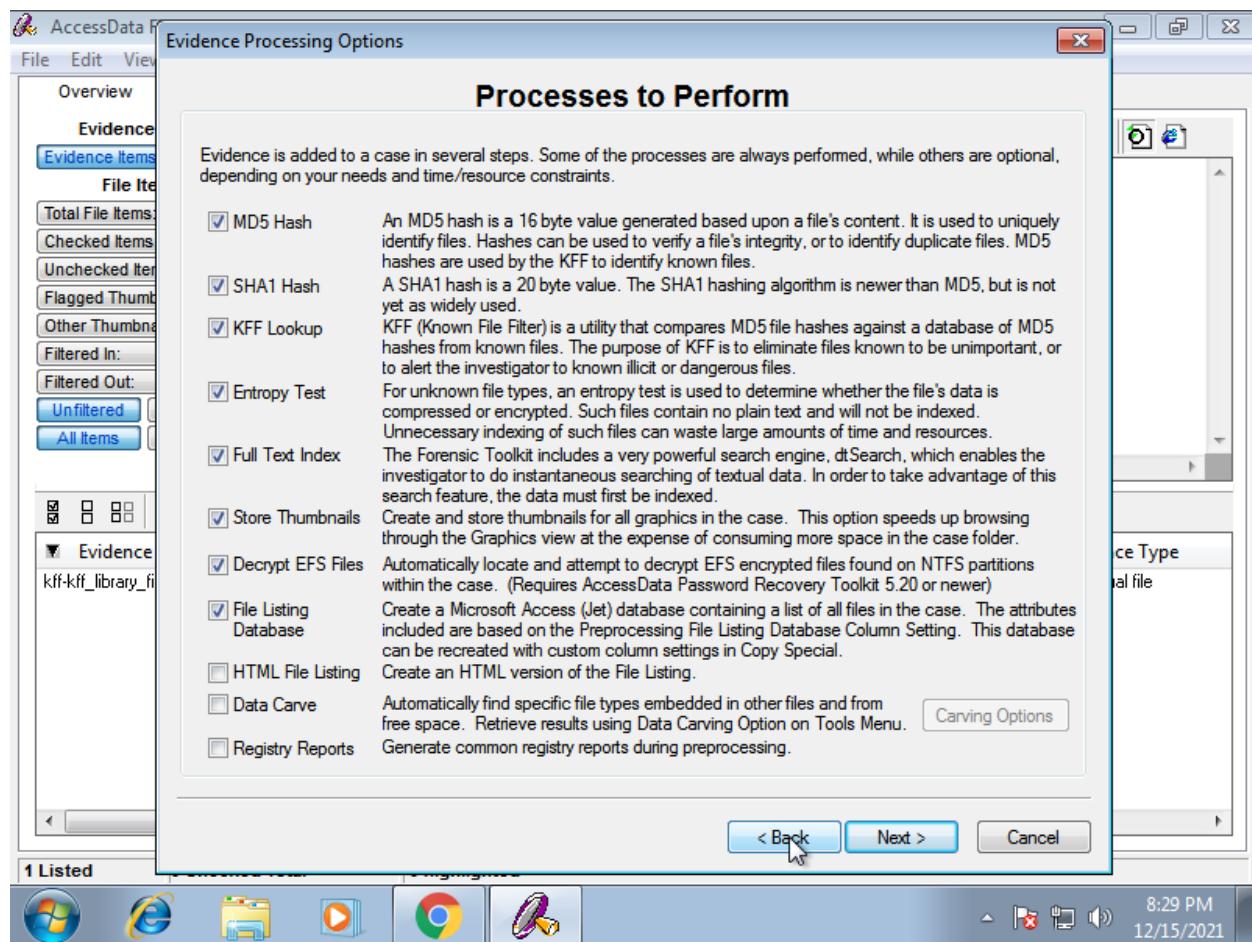
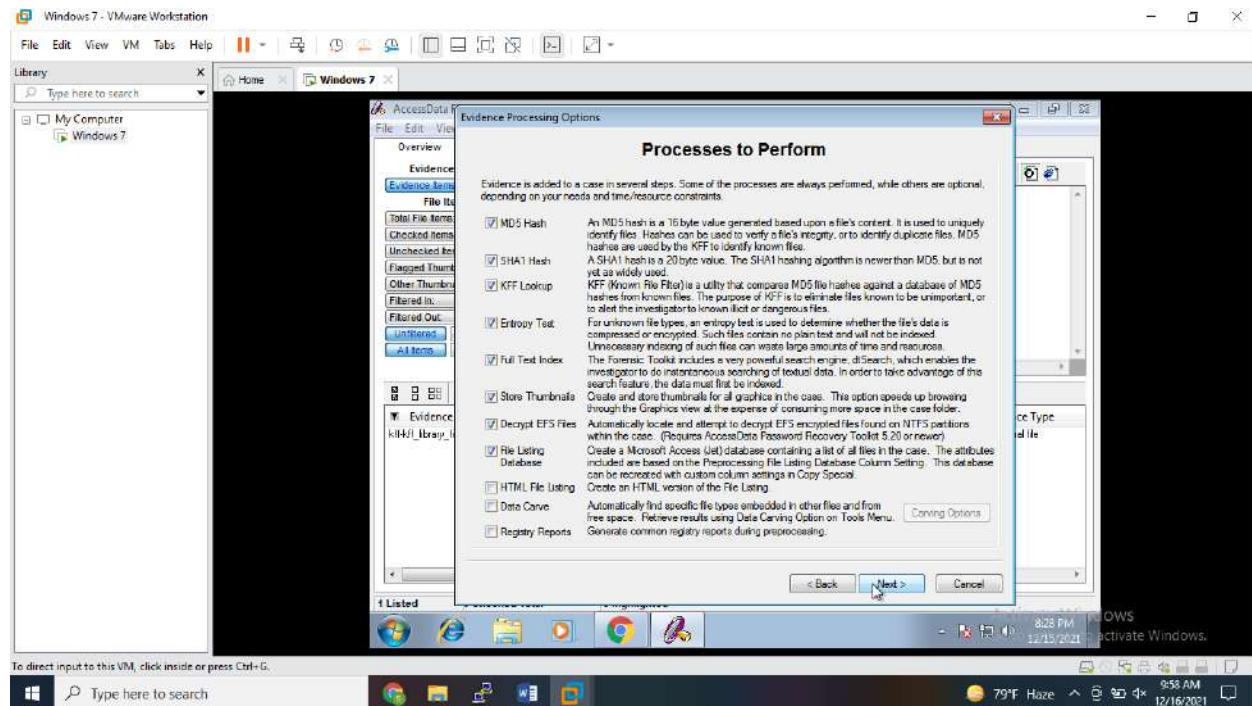


Now File – Add Evidence, and add Outlook’s pst file.

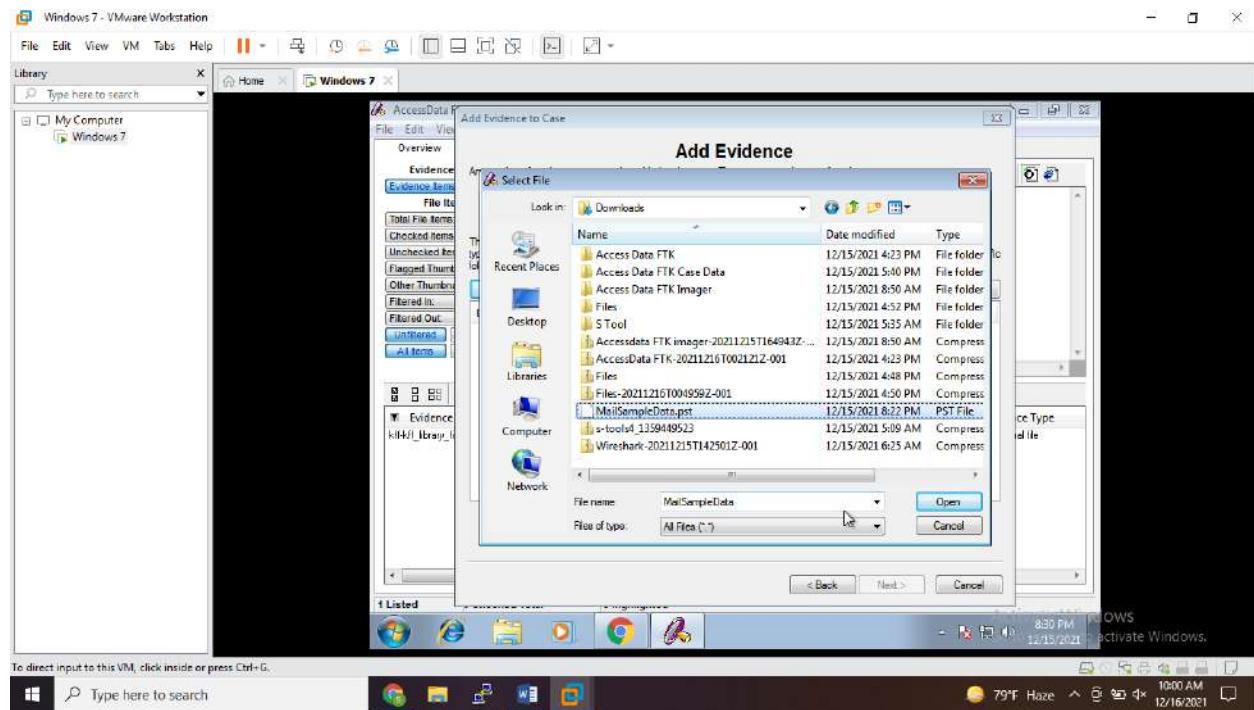
Keep this by default.



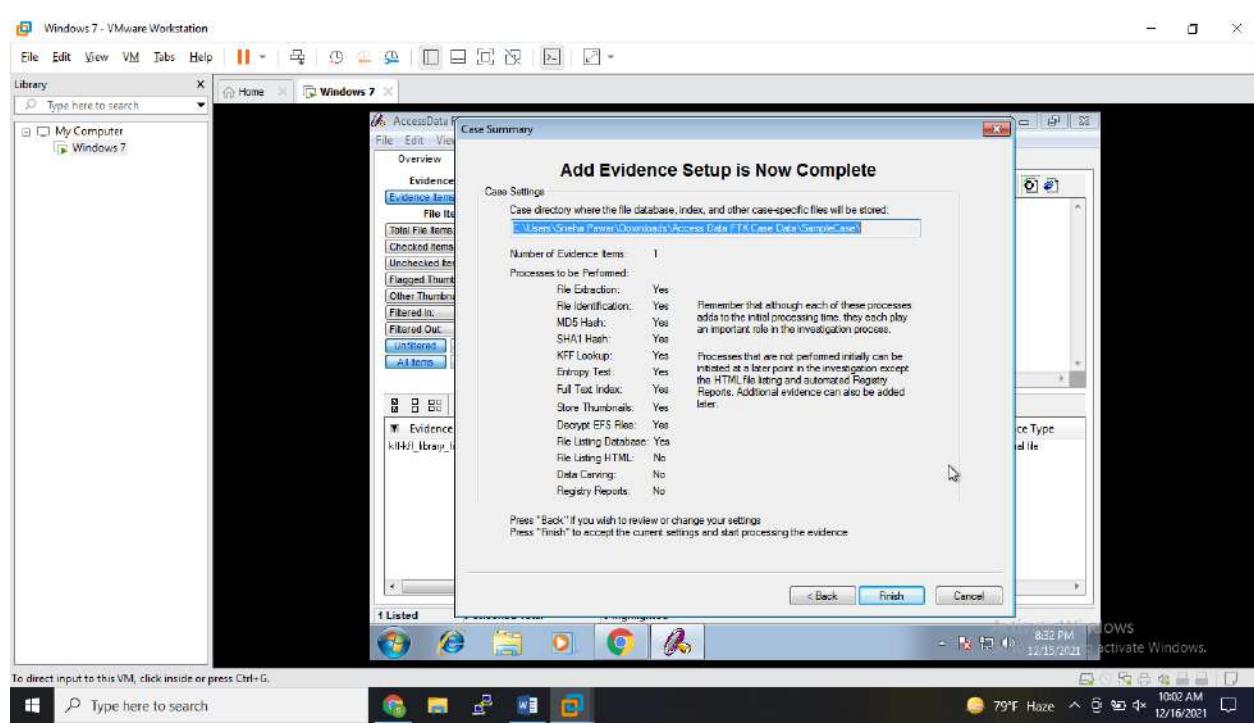
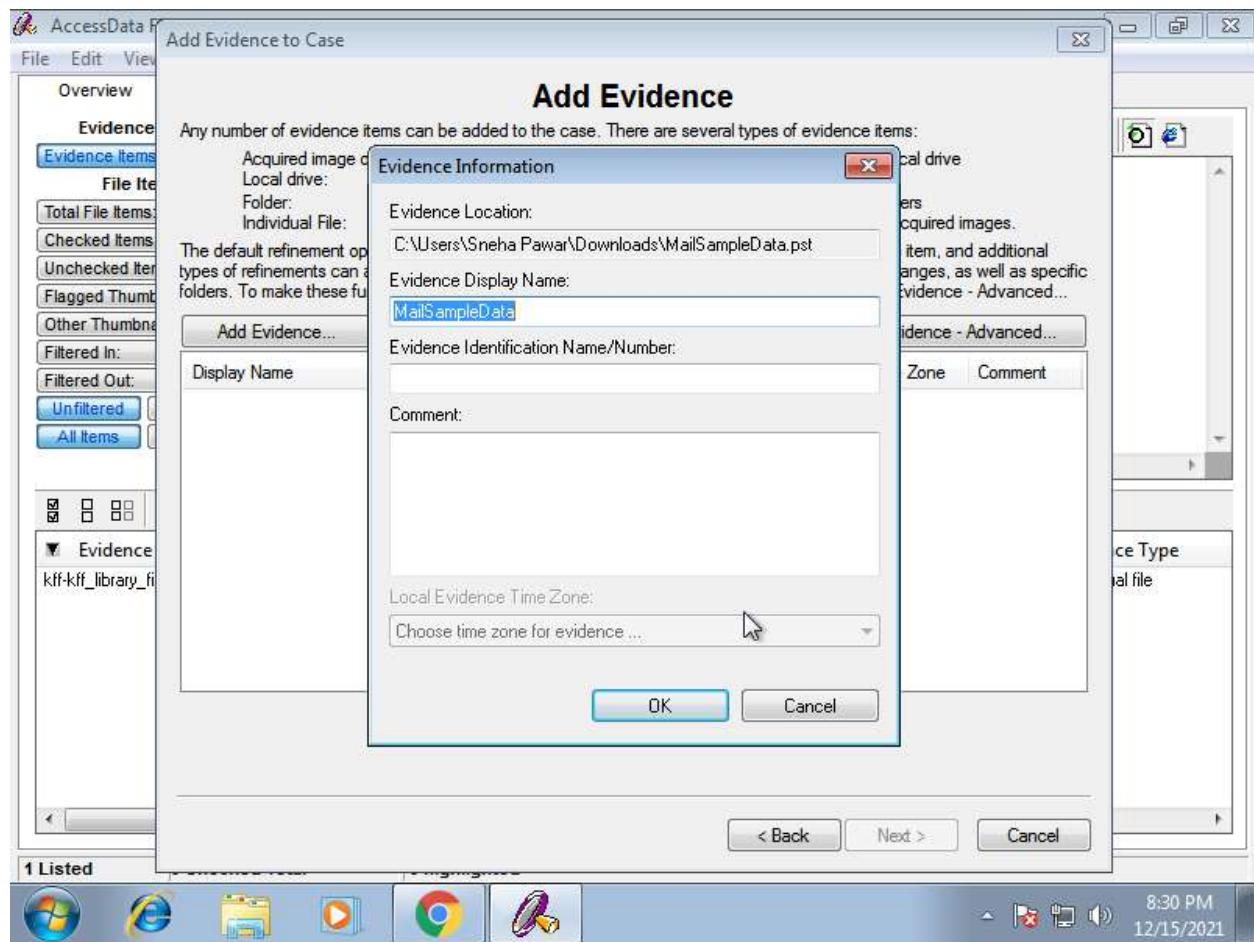
Click Next



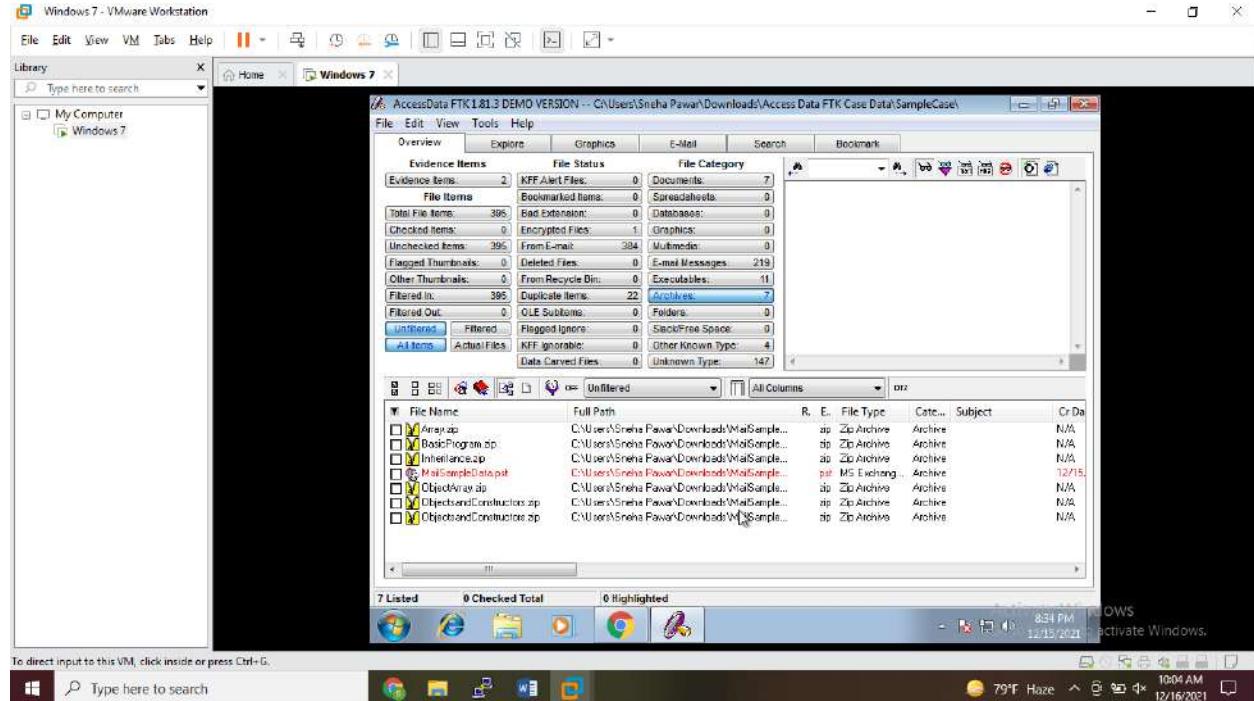
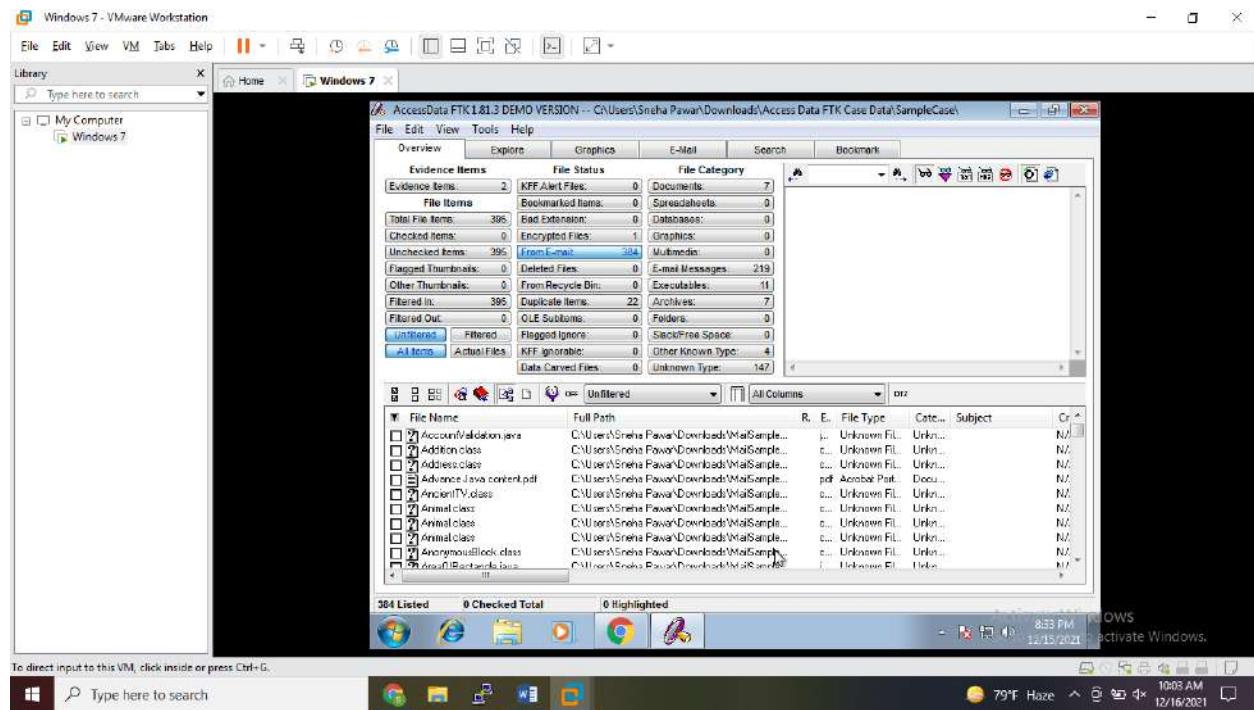
Then Add Evidence – Individual File – Browse location of a pst file.

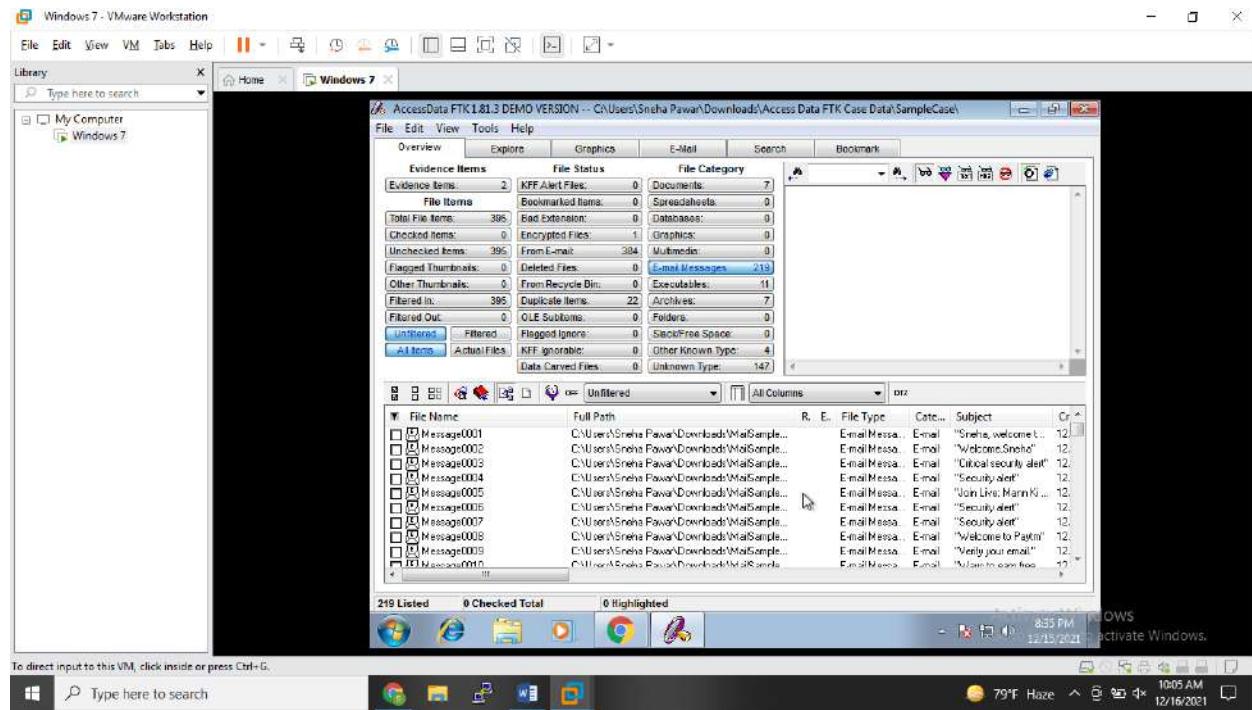


Click on Ok. And then click on Next.

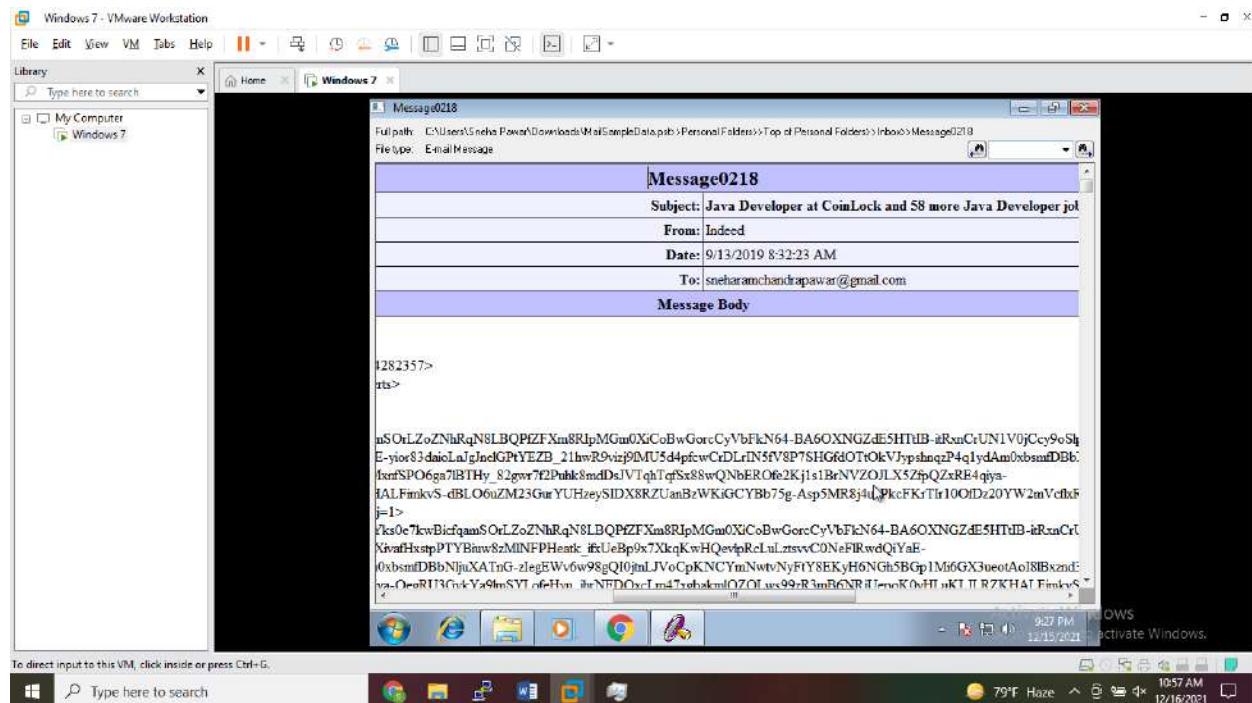


Emails will get acquired as you can see after double clicking on an evidence.



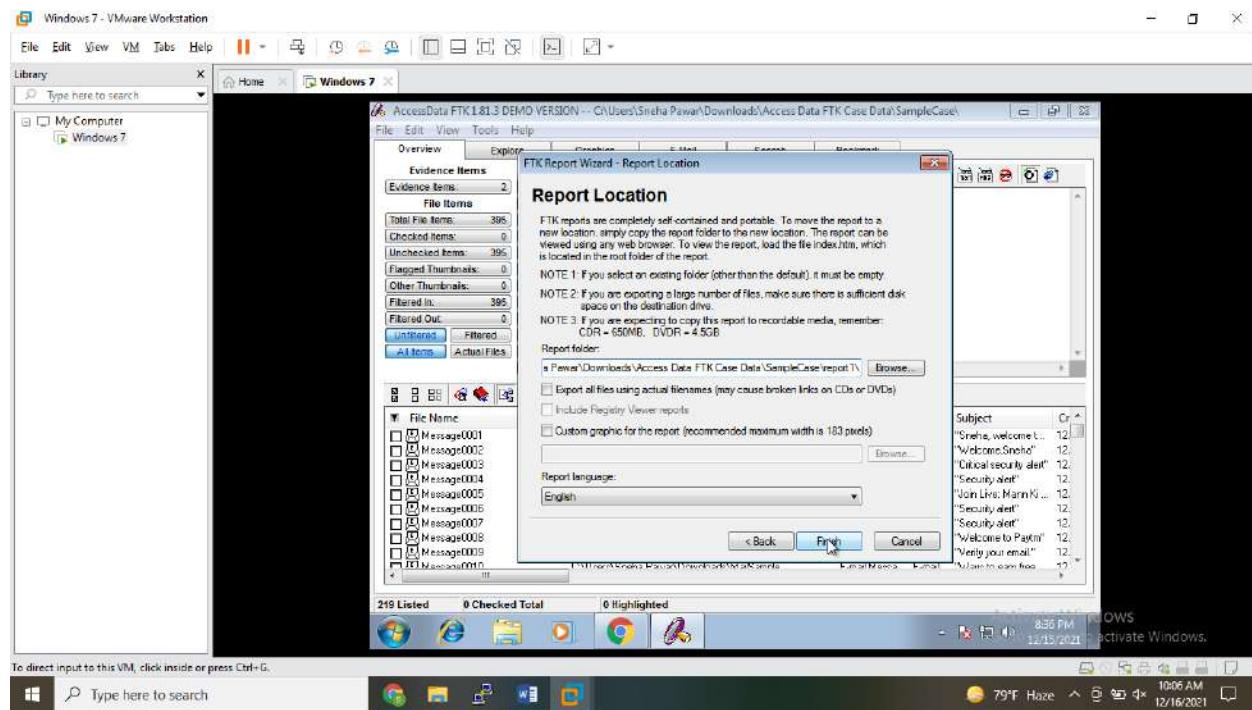
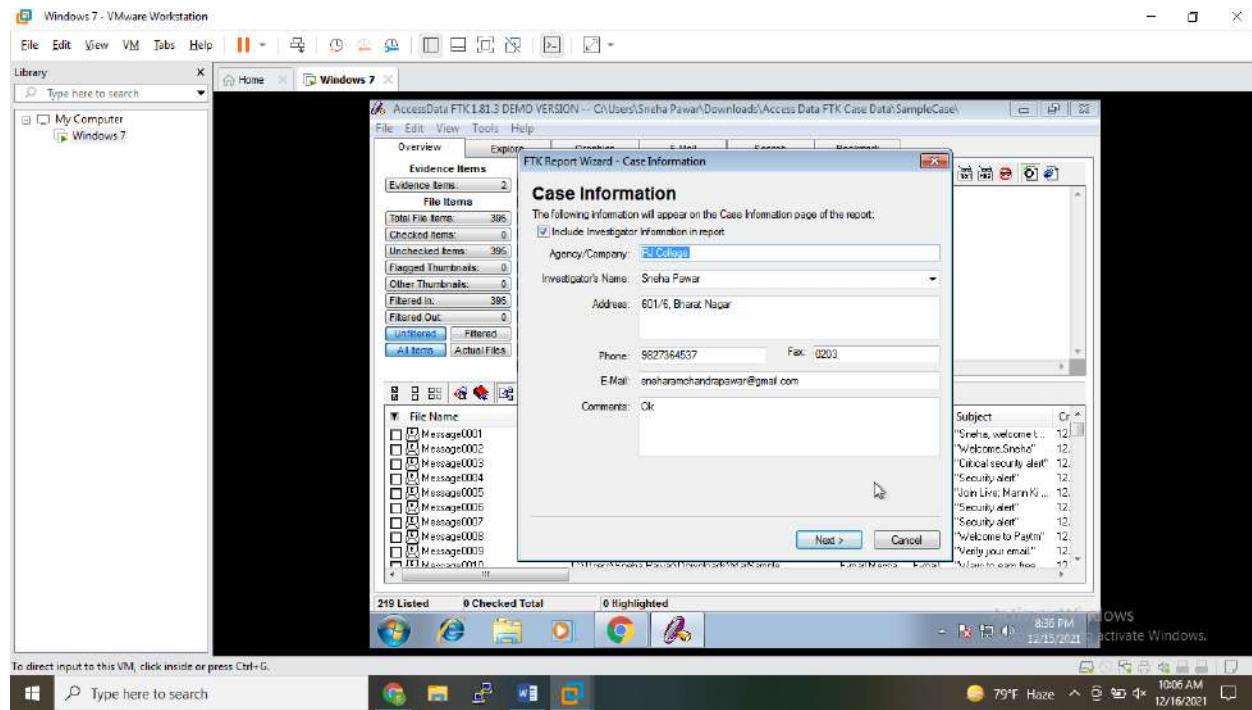


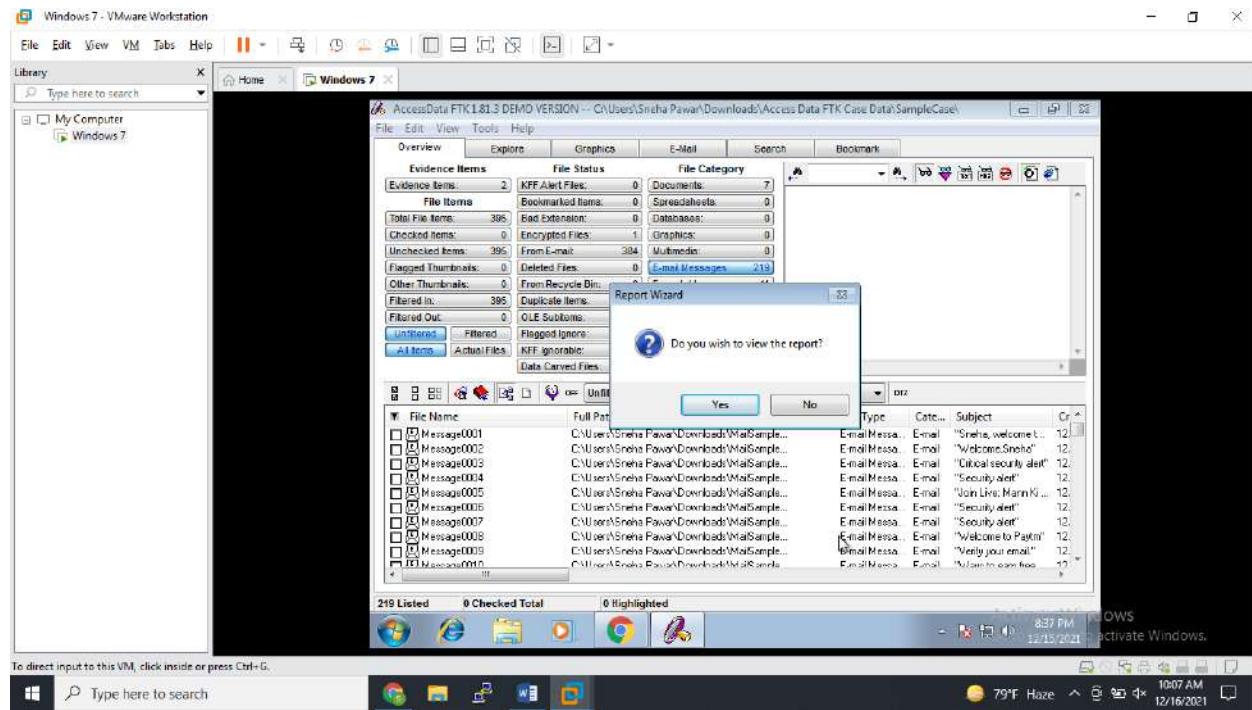
Right click on Mail to see it in Detached view.



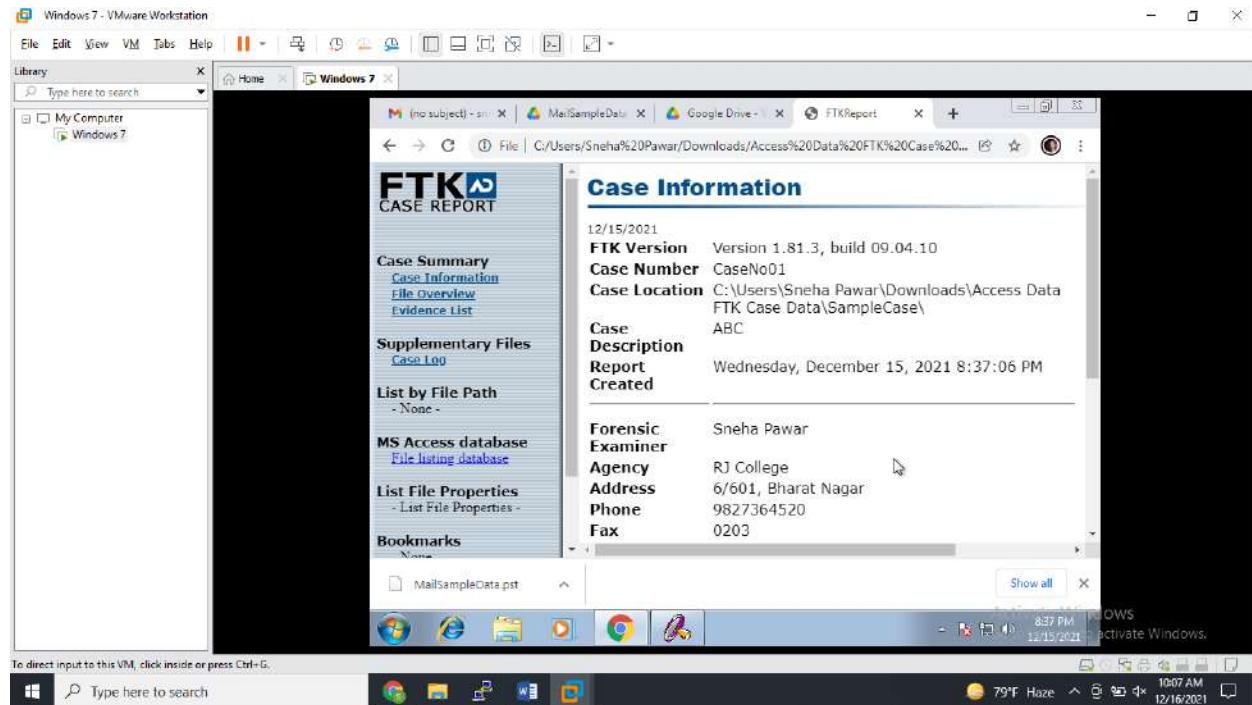
Steps:

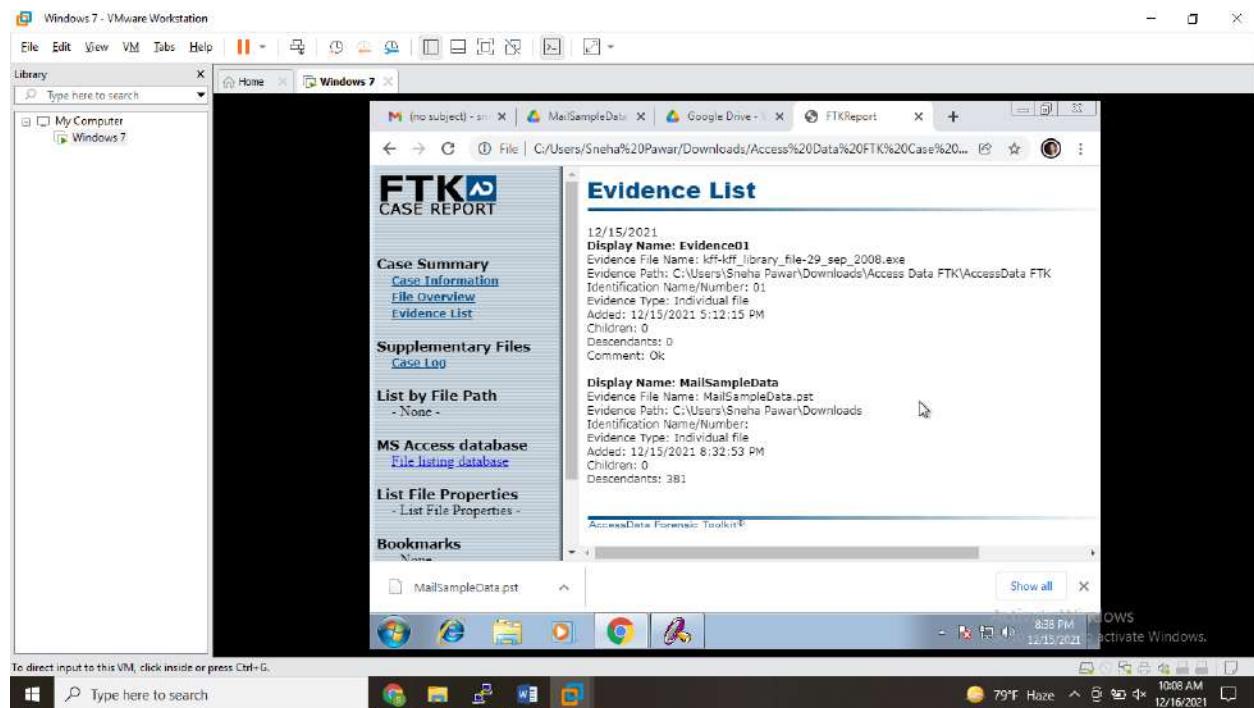
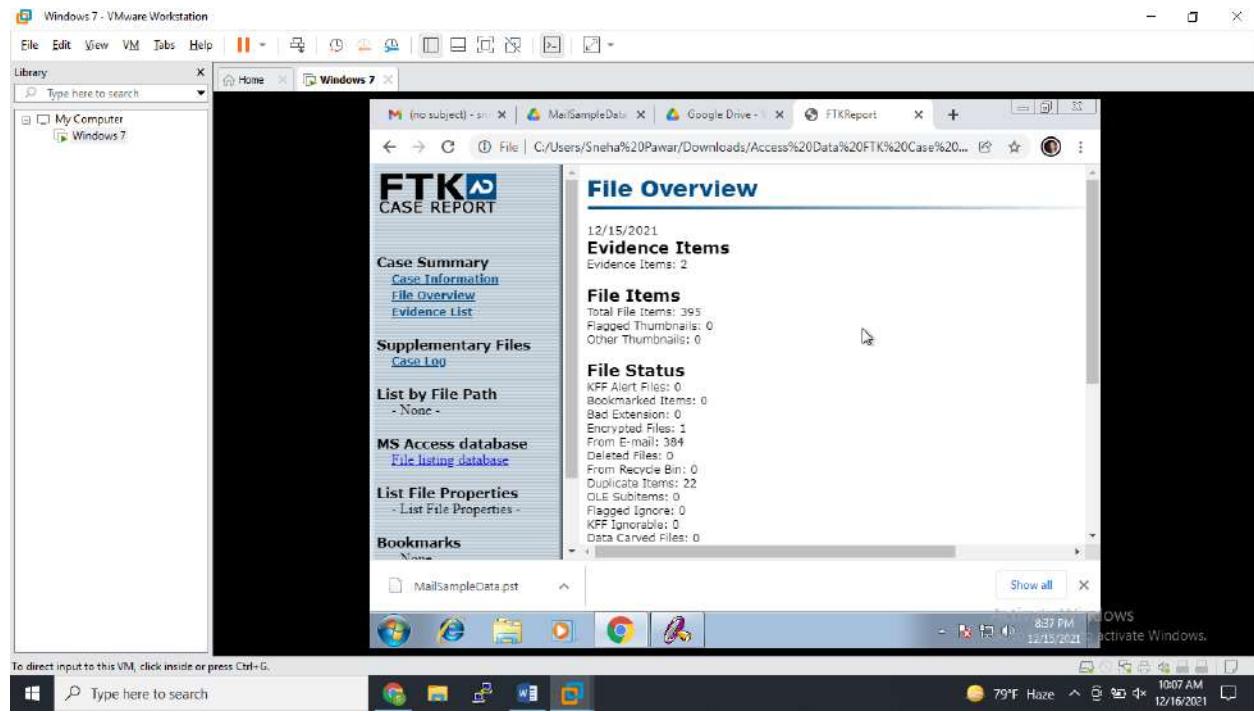
Now click on Report Wizard. And keep options by default and click on Next.





Click on Yes.





Practical No. 10

Aim: Performing Password Cracking [Cain and Abel]

What is Password Cracking?

Password cracking is the process of using an application program to identify an unknown or forgotten password to a computer or network resource. It can also be used to help a threat actor obtain unauthorized access to resources.

With the information malicious actors gain using password cracking, they can undertake a range of criminal activities. Those include stealing banking credentials or using the information for identity theft and fraud.

A password cracker recovers passwords using various techniques. The process can involve comparing a list of words to guess passwords or the use of an [algorithm](#) to repeatedly guess the password.

What does a password cracking attack look like?

The general process a password cracker follows involves these four steps:

1. Steal a password via some nefarious means. That password has likely been encrypted before being stored using a [hash](#). Hashes are mathematical functions that change arbitrary-length inputs into an encrypted fixed-length output.
2. Choose a cracking methodology, such as a [brute-force](#) or [dictionary attack](#), and select a cracking tool.
3. Prepare the password hashes for the cracking program. This is done by providing an input to the hash function to create a hash that can be authenticated.
4. Run the cracking tool.

A password cracker may also be able to identify encrypted passwords. After retrieving the password from the computer's memory, the program may be able

to decrypt it. Or, by using the same algorithm as the system program, the password cracker creates an encrypted version of the password that matches the original.

What are password cracking techniques?

Password crackers use two primary methods to identify correct passwords: brute-force and dictionary attacks. However, there are plenty of other password cracking methods, including the following:

- **Brute force.** This attack runs through combinations of characters of a predetermined length until it finds the combination that matches the password.
- **Dictionary search.** Here, a password cracker searches each word in the dictionary for the correct password. Password dictionaries exist for a variety of topics and combinations of topics, including politics, movies and music groups.
- **Phishing.** These attacks are used to gain access to user passwords without the use of a password cracking tool. Instead, a user is fooled into clicking on an email attachment. From here, the attachment could install [malware](#) or prompt the user to use their email to sign into a false version of a website, revealing their password.
- **Malware.** Similar to phishing, using malware is another method of gaining unauthorized access to passwords without the use of a password cracking tool. Malware such as [keyloggers](#), which track keystrokes, or screen [scrapers](#), which take screenshots, are used instead.
- **Rainbow attack.** This approach involves using different words from the original password in order to generate other possible passwords. Malicious actors can keep a list called a [rainbow table](#) with them. This list contains leaked and previously cracked passwords, which will make the overall password cracking method more effective.
- **Guessing.** An attacker may be able to guess a password without the use of tools. If the threat actor has enough information about the victim or the victim is using a common enough password, they may be able to come up with the correct characters.

Some password cracking programs may use hybrid attack methodologies where they search for combinations of dictionary entries and numbers or special characters. For example, a password cracker may search for ants01, ants02, ants03, etc. This can be helpful when users have been advised to include a number in their password.

What are password cracking tools?

Password crackers can be used maliciously or legitimately to recover lost passwords. Among the password cracking tools available are the following three:

1. **Cain and Abel.** This password recovery software can recover passwords for Microsoft Windows user accounts and Microsoft Access passwords. Cain and Abel uses a [graphical user interface](#), making it more user-friendly than comparable tools. The software uses dictionary lists and brute-force attack methods.
2. **Ophcrack.** This password cracker uses rainbow tables and brute-force attacks to crack passwords. It runs on Windows, macOS and Linux.
3. **John the Ripper.** This tool uses a dictionary list approach and is available primarily for macOS and Linux systems. The program has a command prompt to crack passwords, making it more difficult to use than software like Cain and Abel.

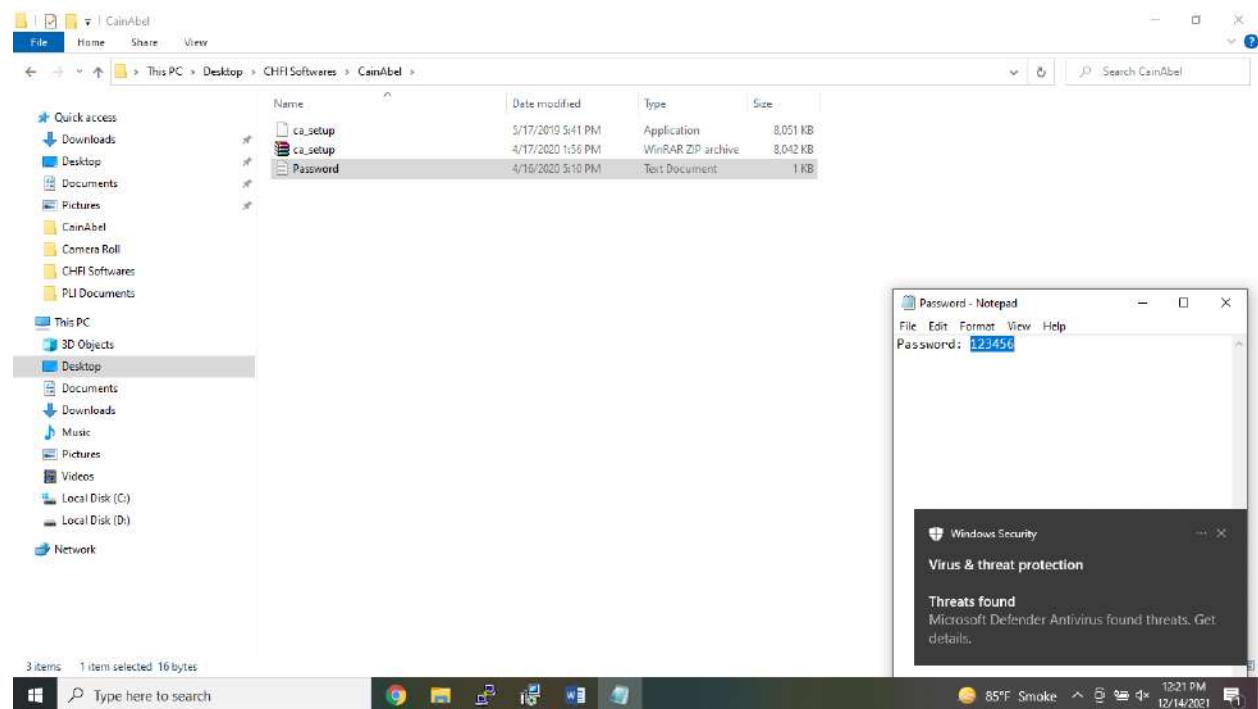
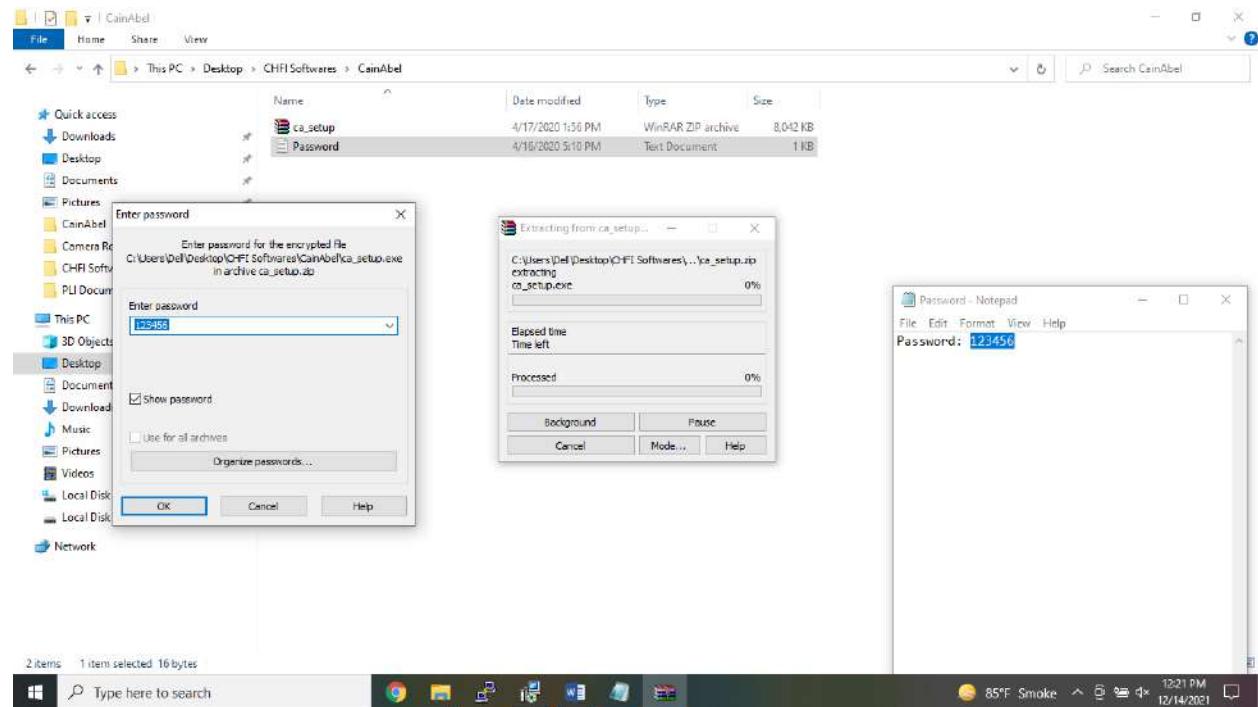
Steps:

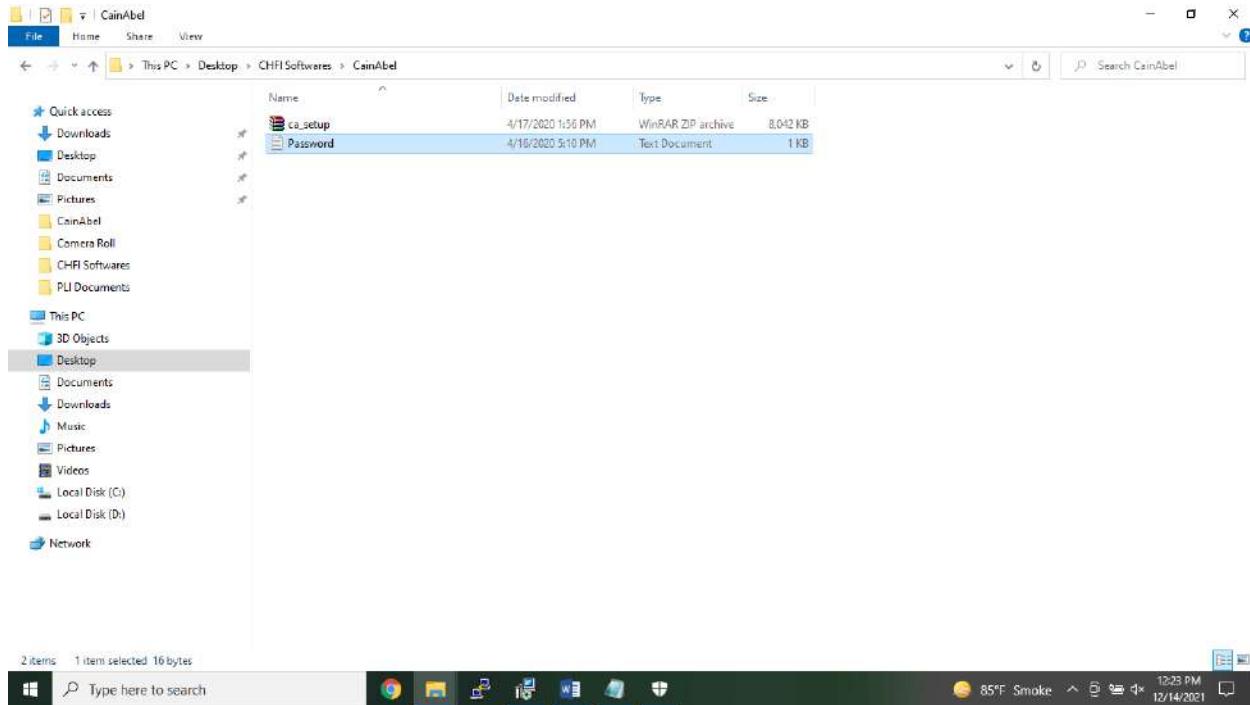
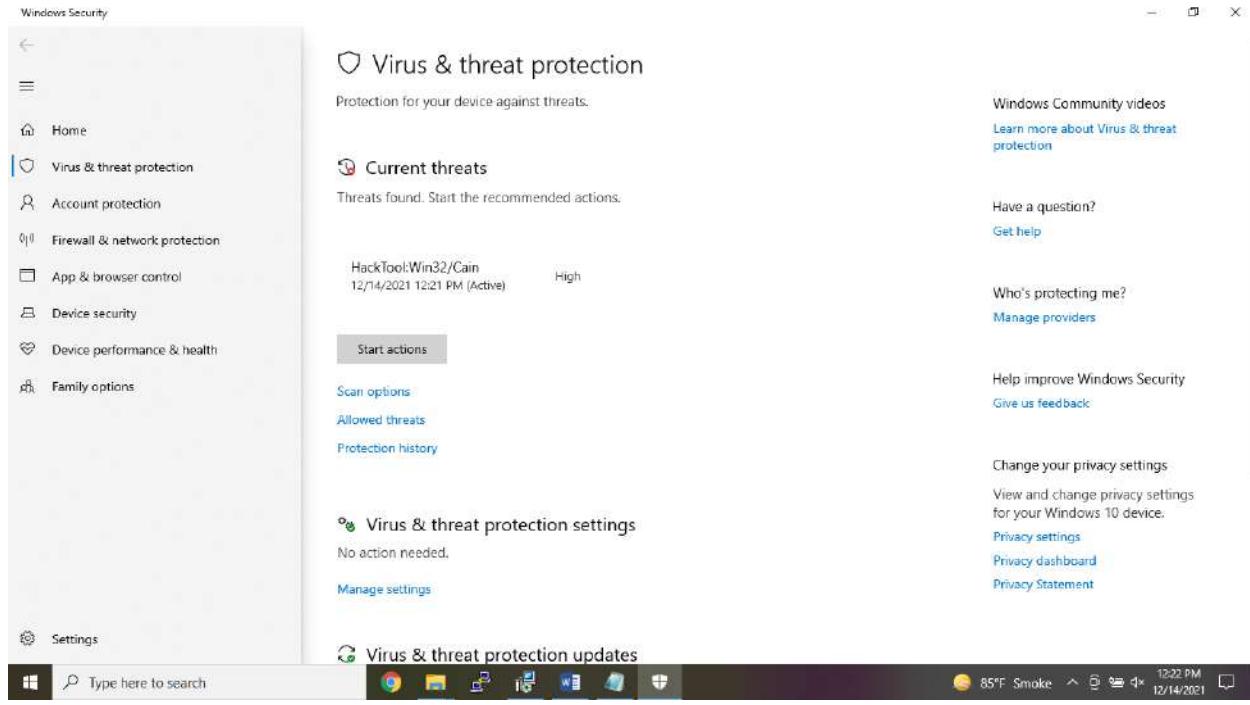
You can also download CainAbel from the link on your windows 10 Virtual Machine:

<https://www.malavida.com/en/soft/cain-and-abel/download>

Don't install CainAbel on your primary windows computer or laptop. Install it on the Virtual machine instead. Because Windows10 will see CainAbel as a malicious software. And will give alert on system. And won't let you extract the setup on your system. It will automatically remove the setup from your machine, as shown

in below steps. If still you want to do it on your windows10 system then you need to disable the Antivirus.



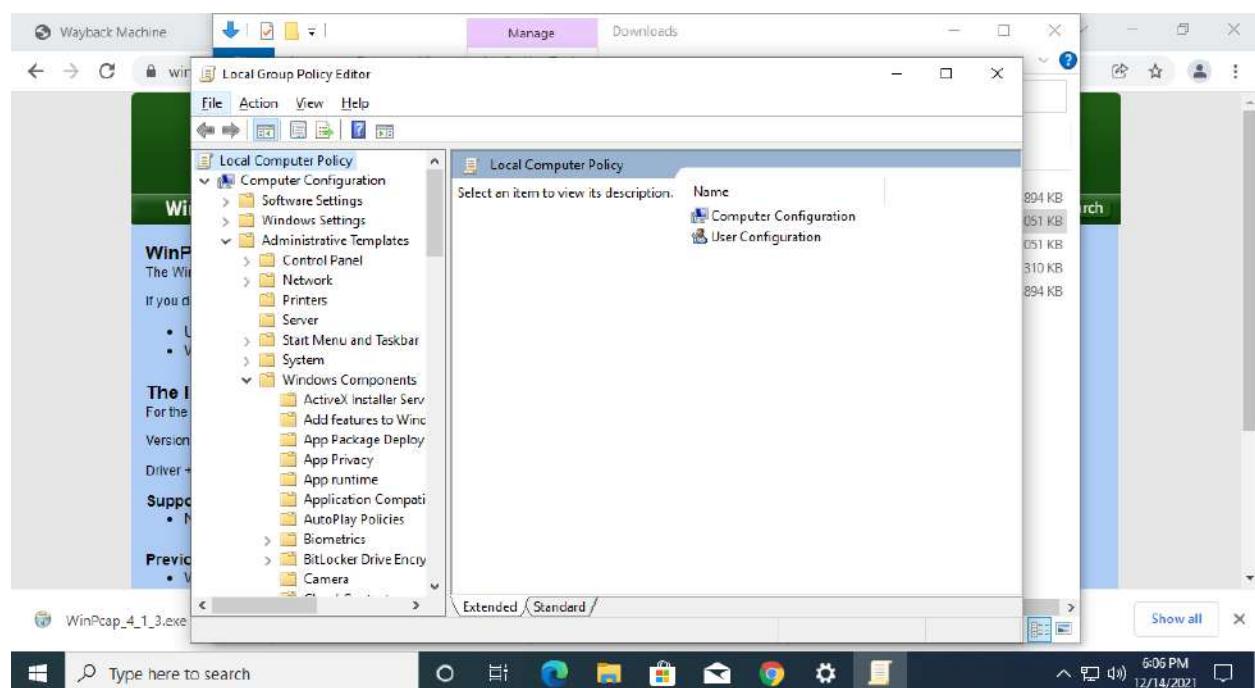
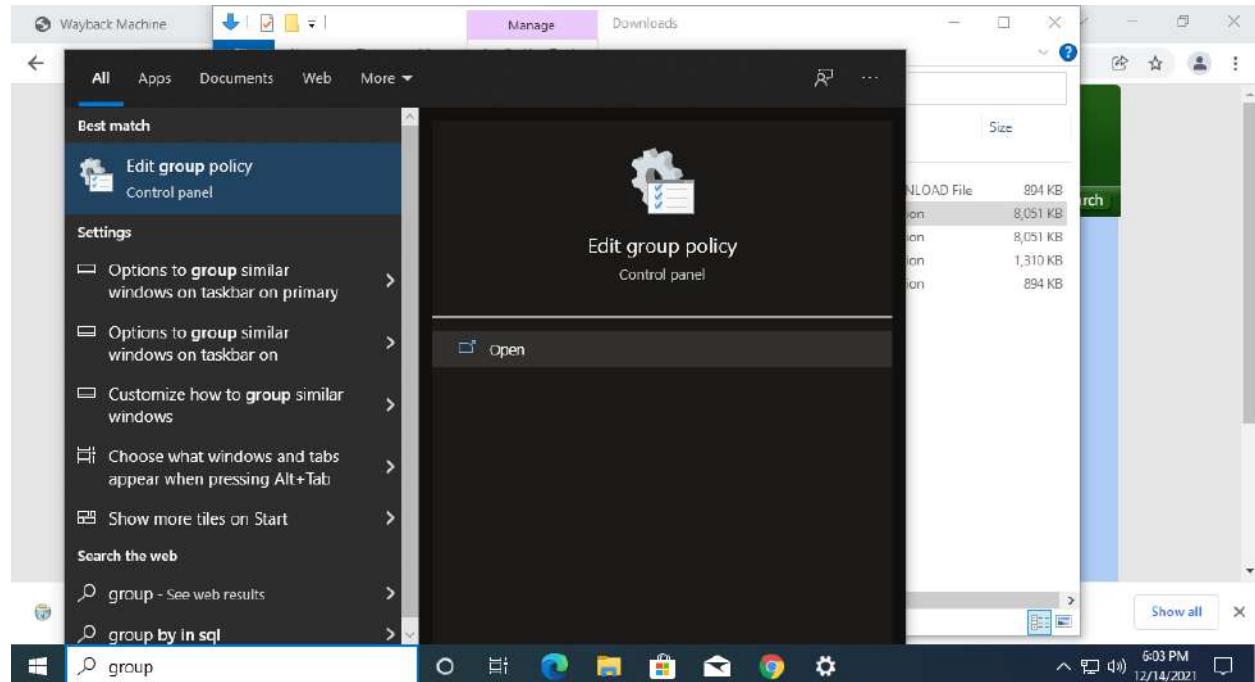


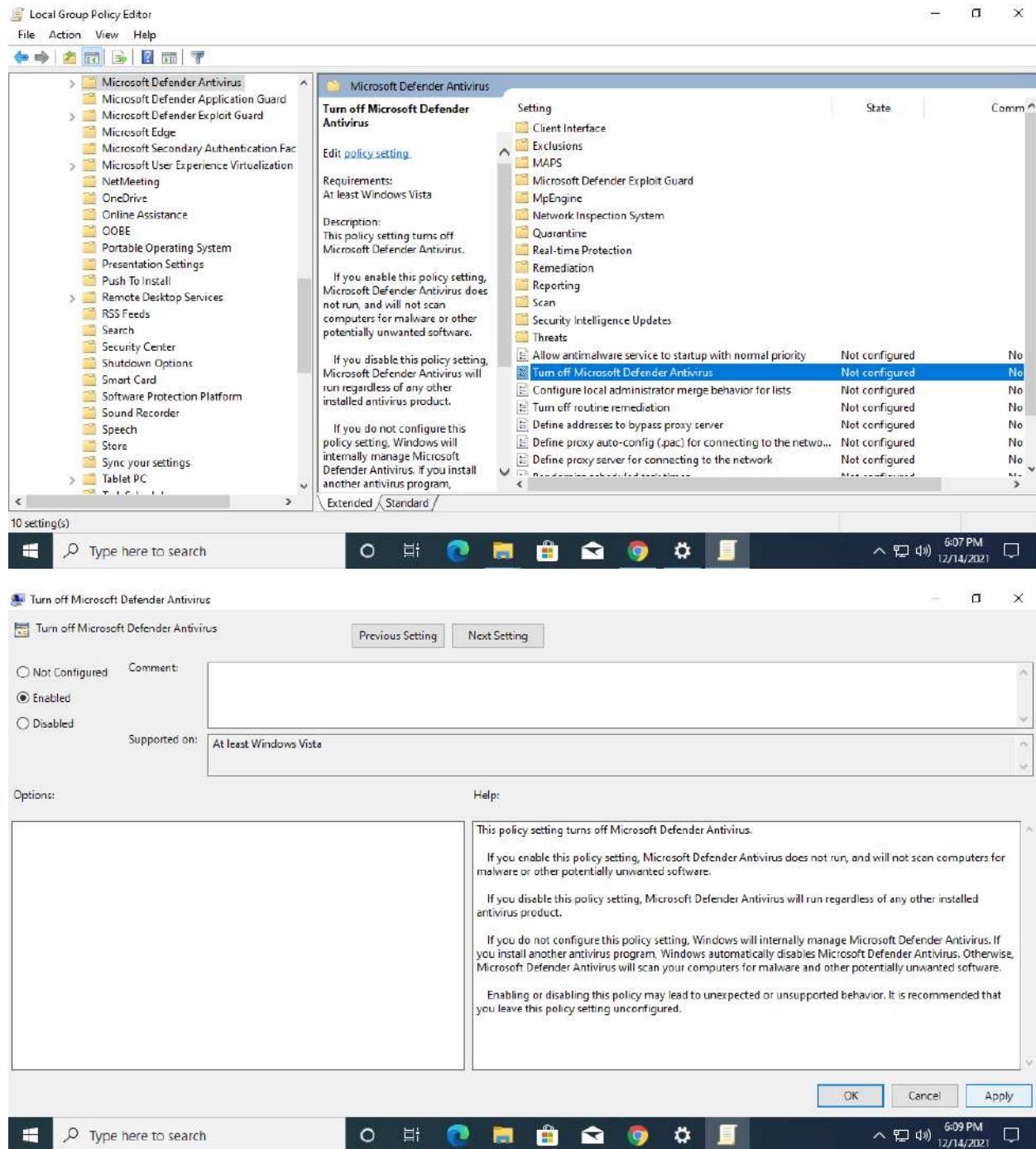
Download and install VMware workstation and create a Windows10 Virtual Machine on it.

You need to disable all the options under Virus and Threat Protection settings.

To permanently disable Microsoft Defender Antivirus. Follow the following steps:

Edit the group policy – Administrative template – Windows Component – Microsoft Defender Antivirus Double click on it – Turn off Microsoft defender Antivirus – Click on Apply.



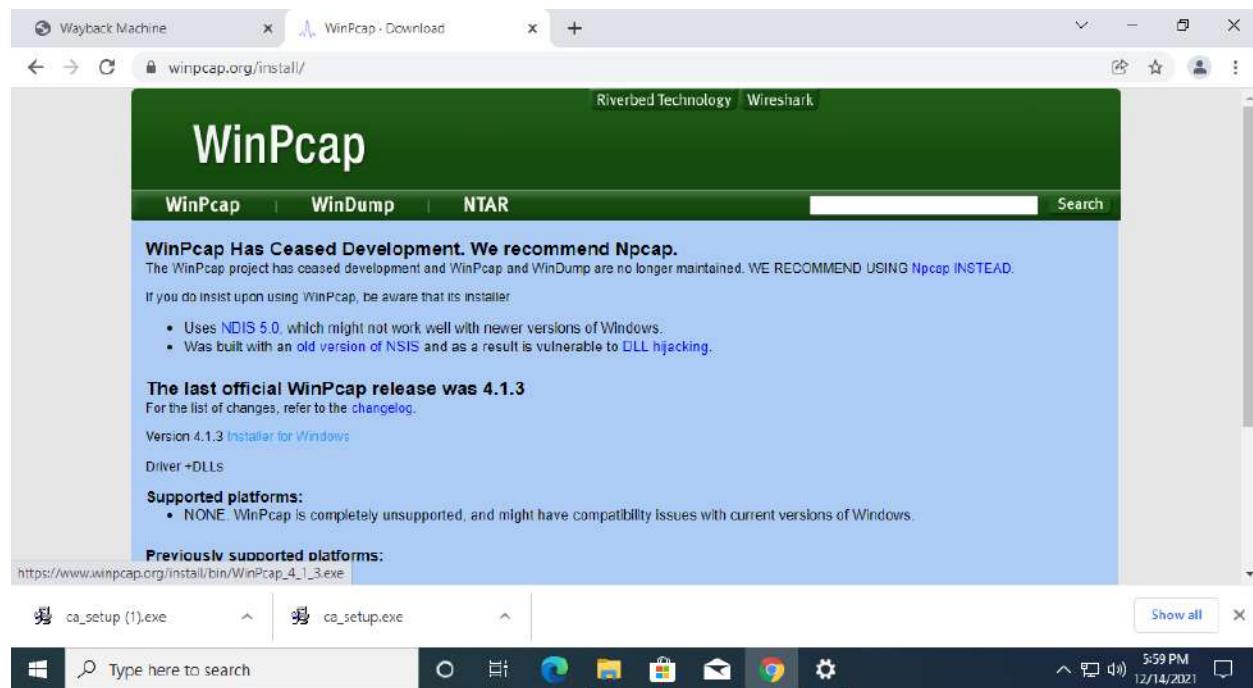


Download the Cain and Abel software from the link below:-

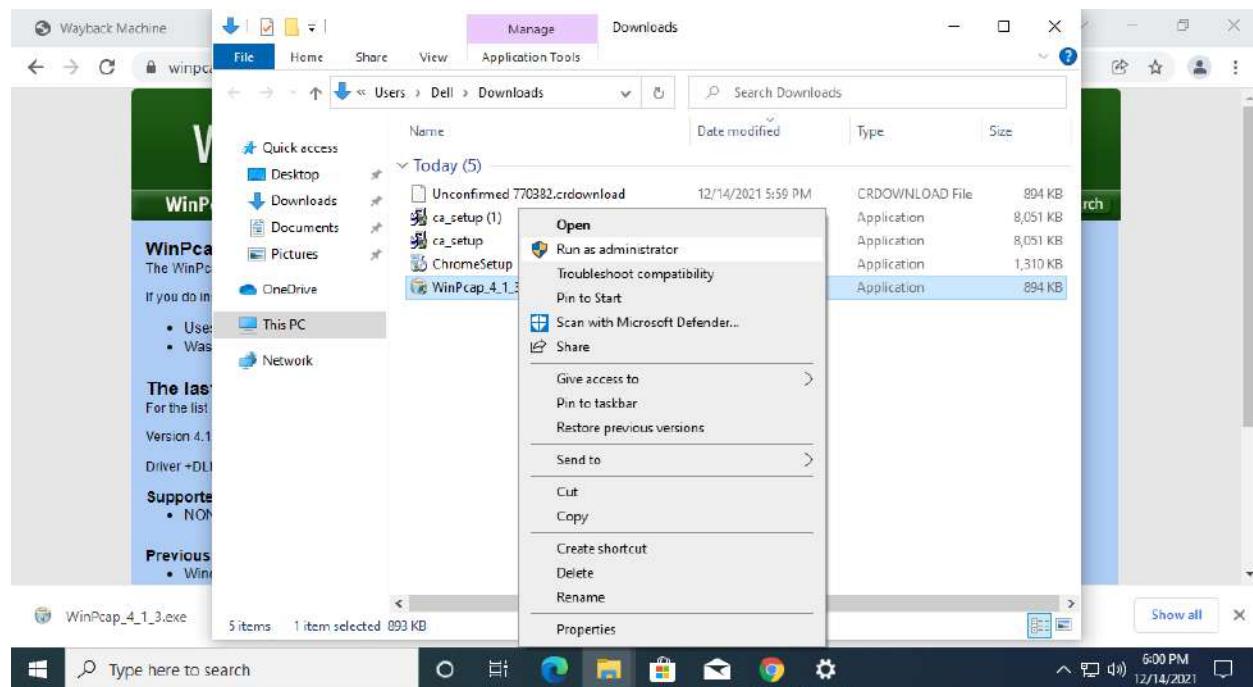
<https://web.archive.org/web/20160214132154/http://www.oxid.it/cain.html>

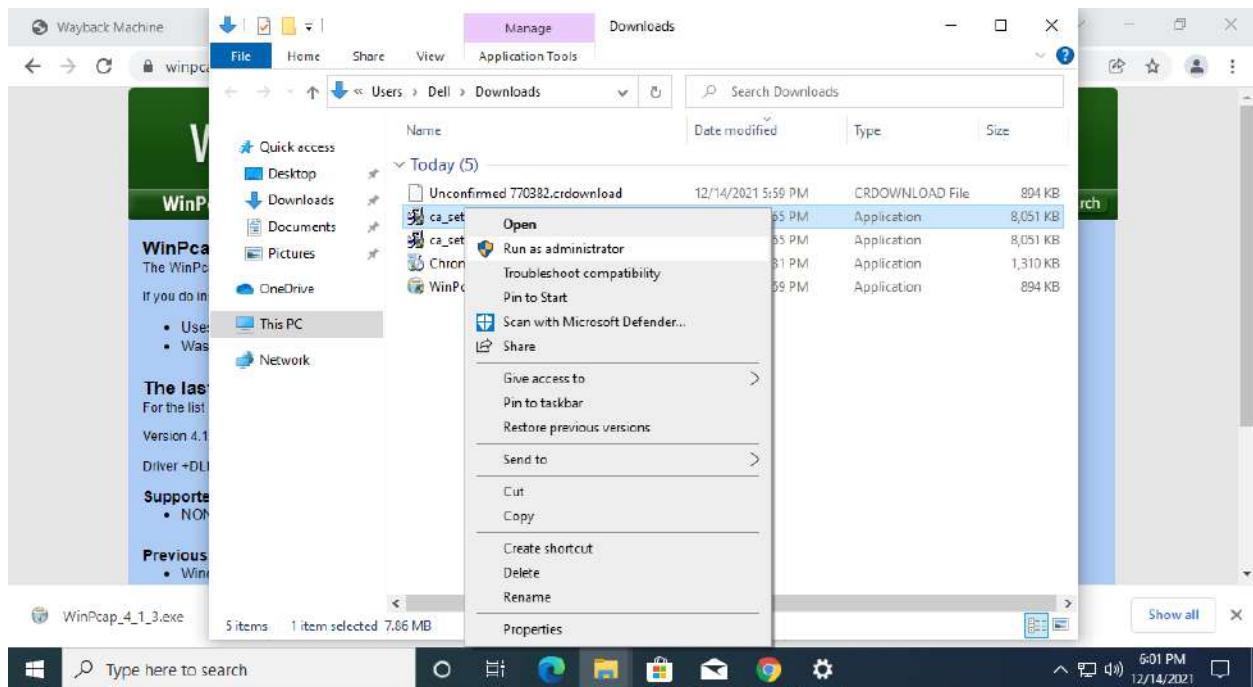
After downloading software don't run the setup quickly. Download another software WinPcap.

www.winpcap.org/install

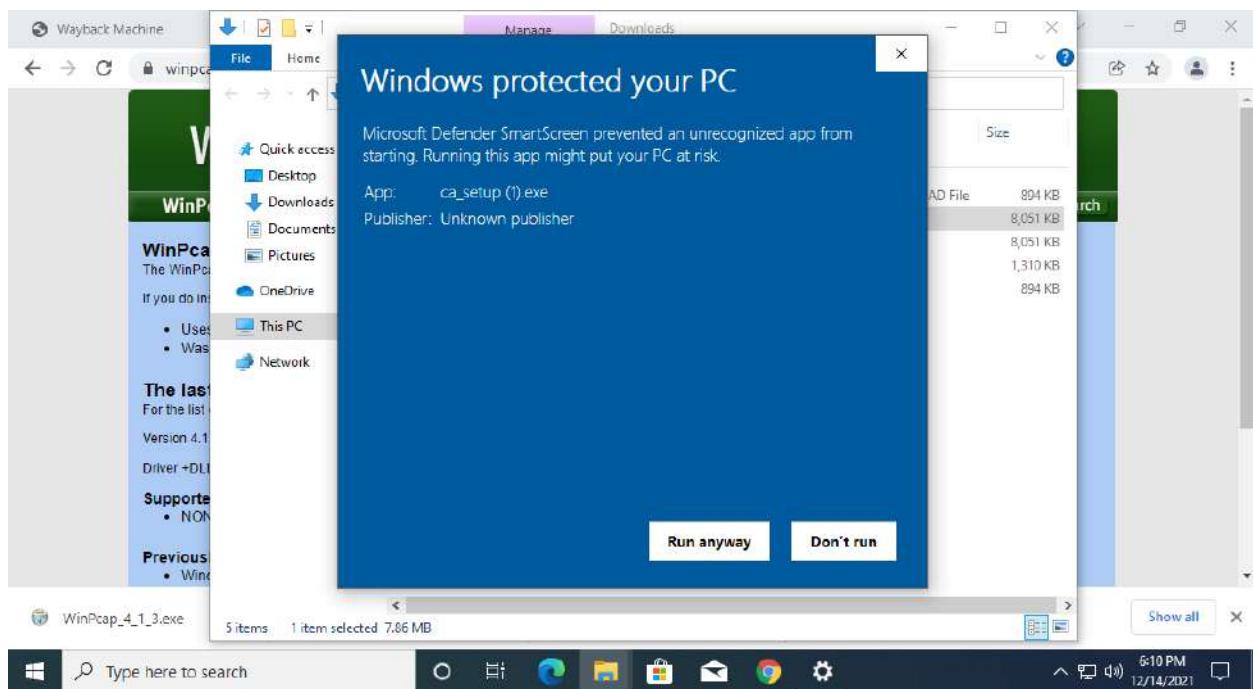


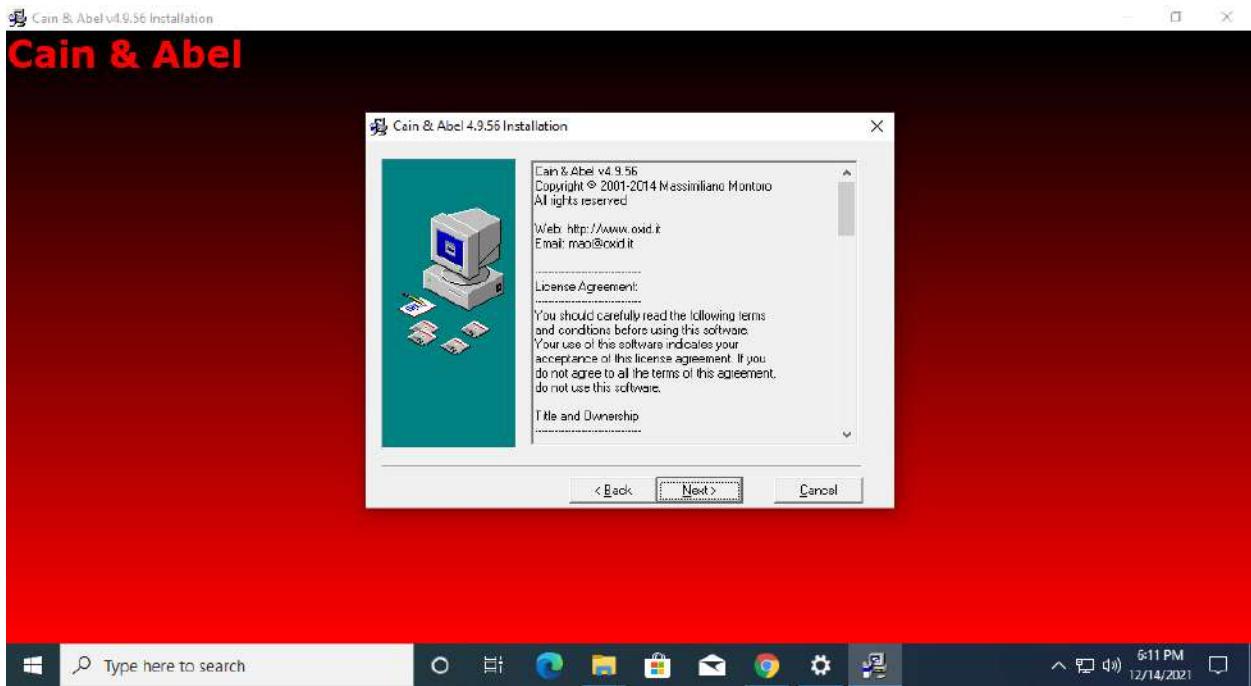
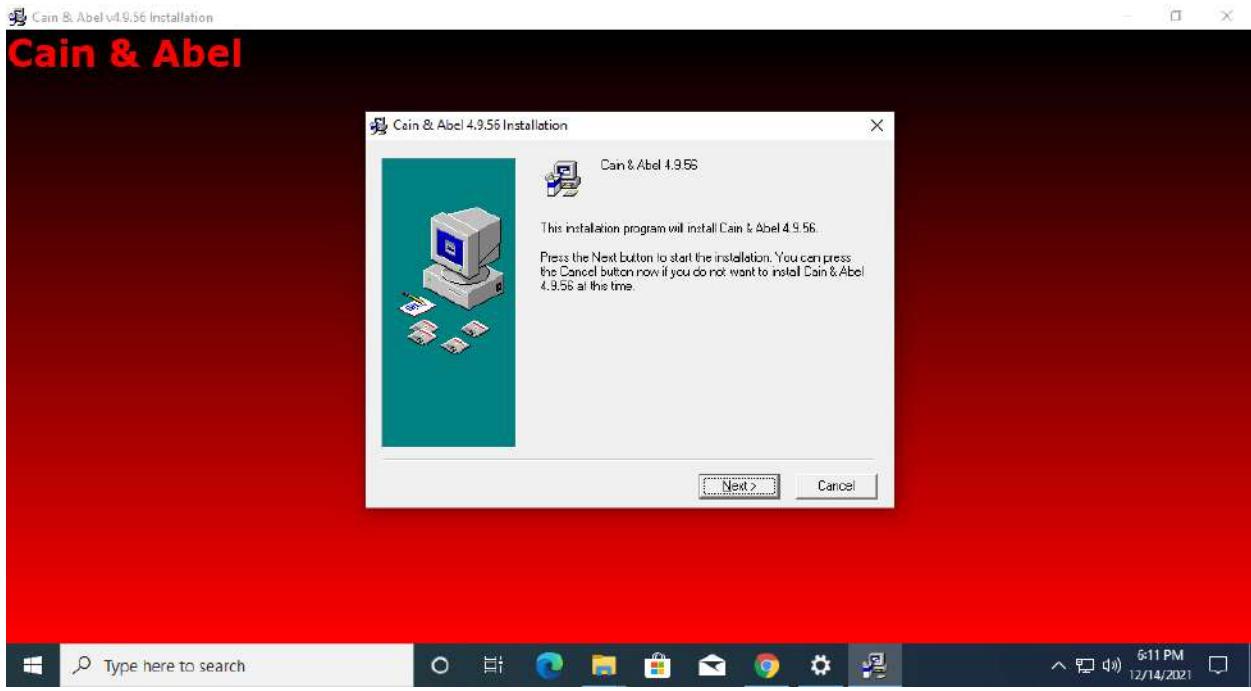
After downloading WinPcap first install it then install CainAbel.



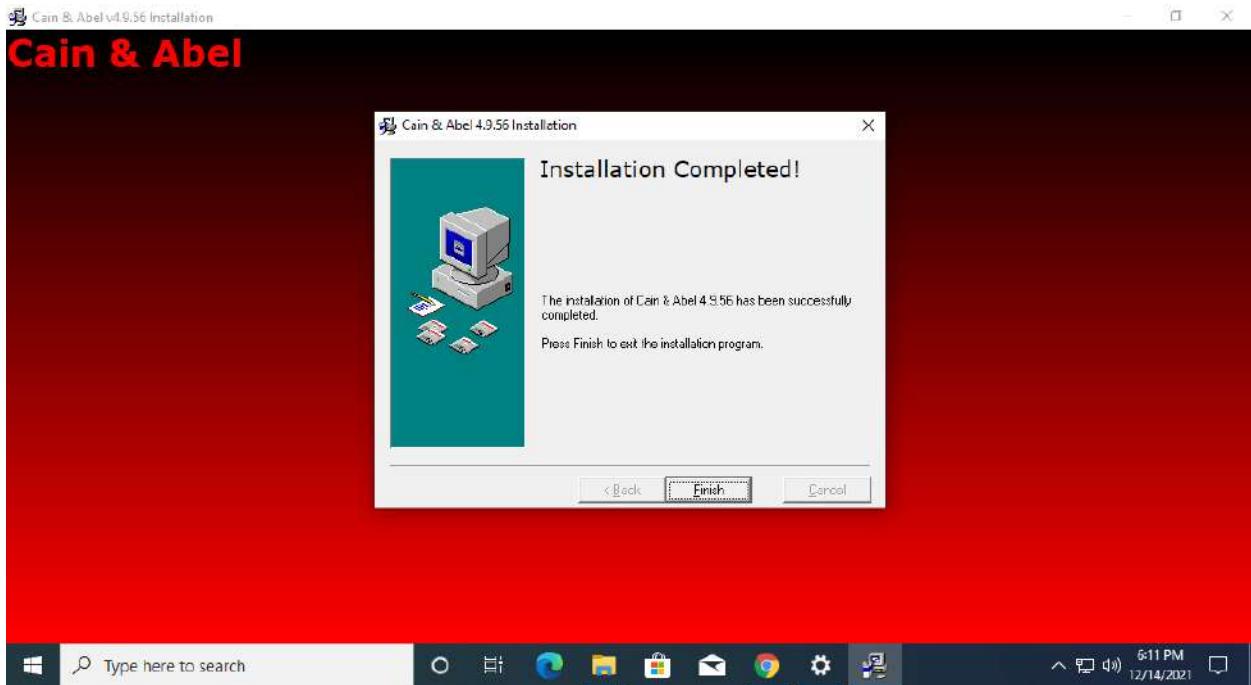


Then Click on Run Anyway.

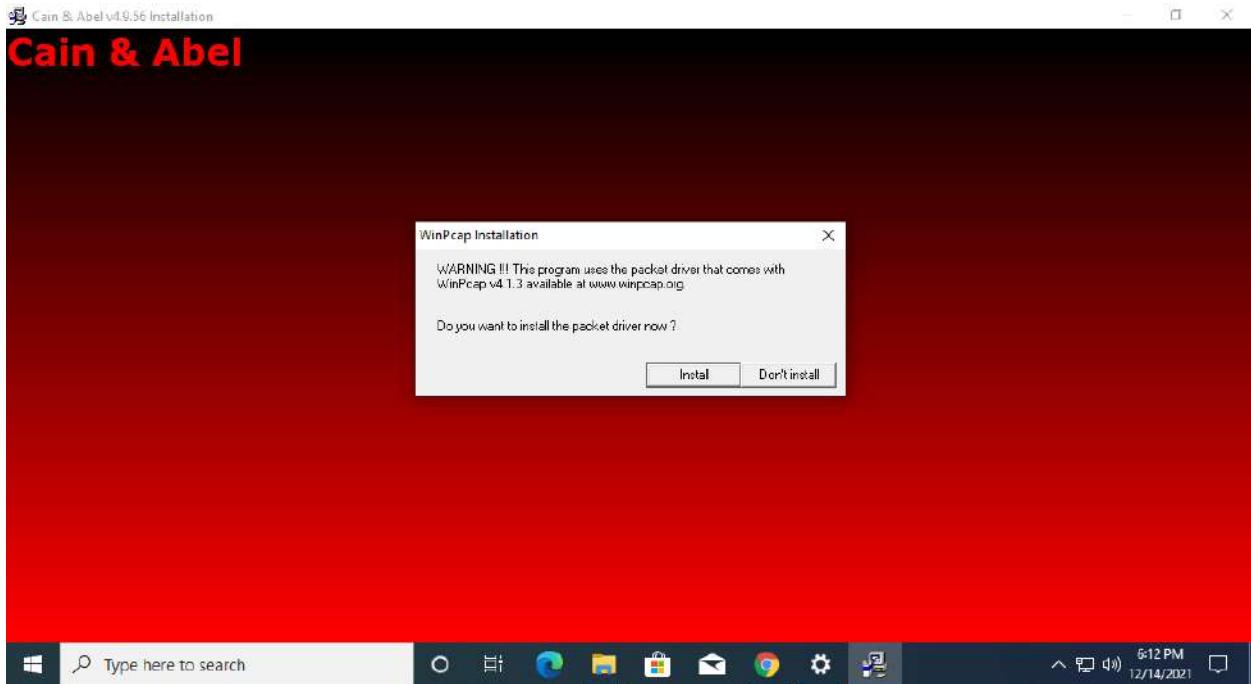




Click on Next by keeping everything default. And finish setup installation.

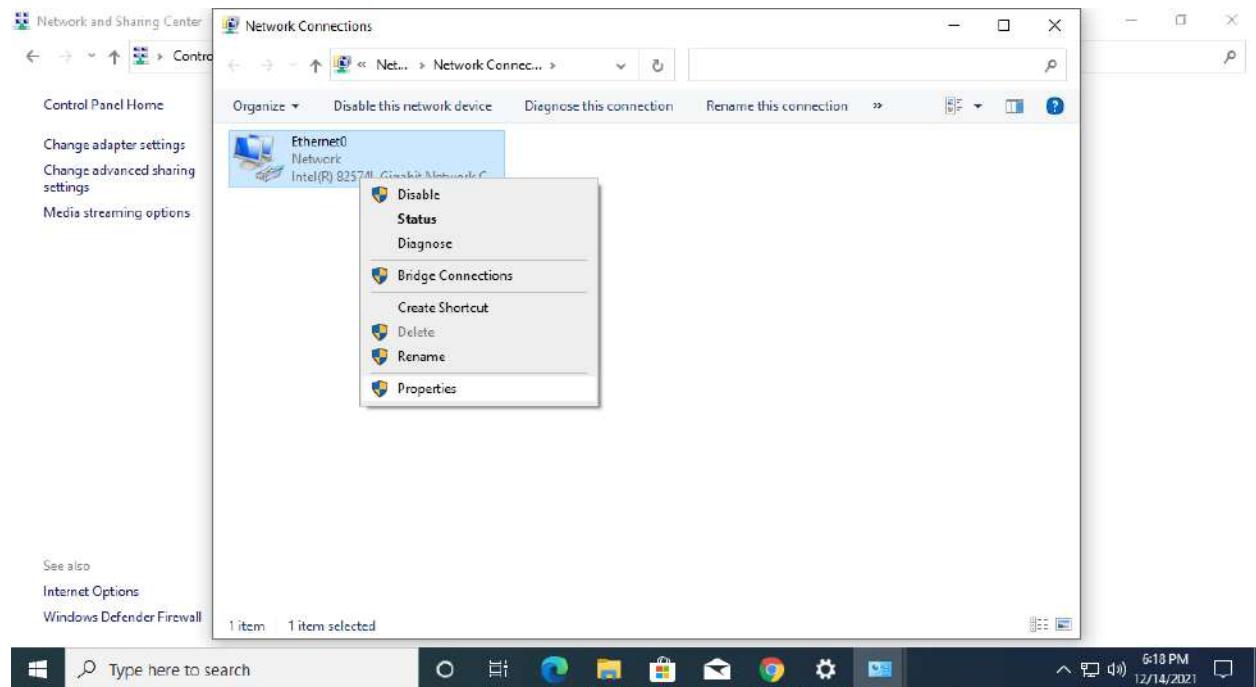


Click on Don't install.

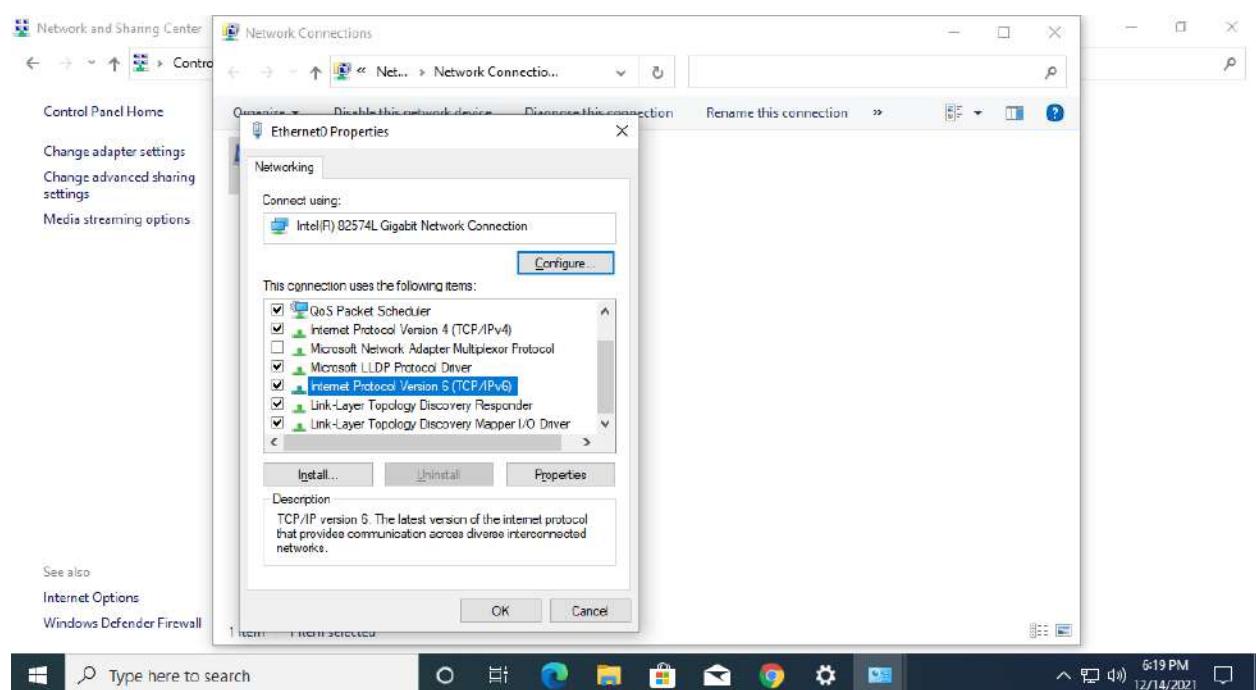


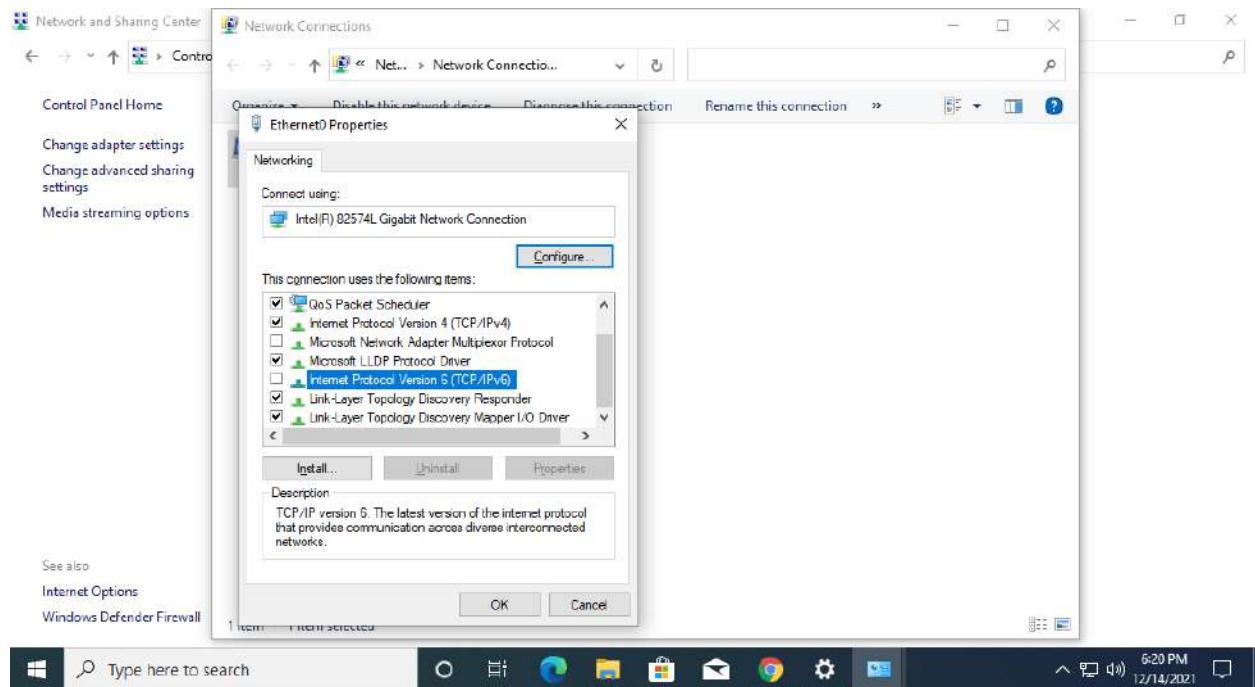
Don't start the CainAbel yet we have to do some changes in the control panel.

Control Panel – Network & Internet – Network & Sharing Center – Change Adapter Settings – Go to Ethernet0 – Right click on it – Properties.



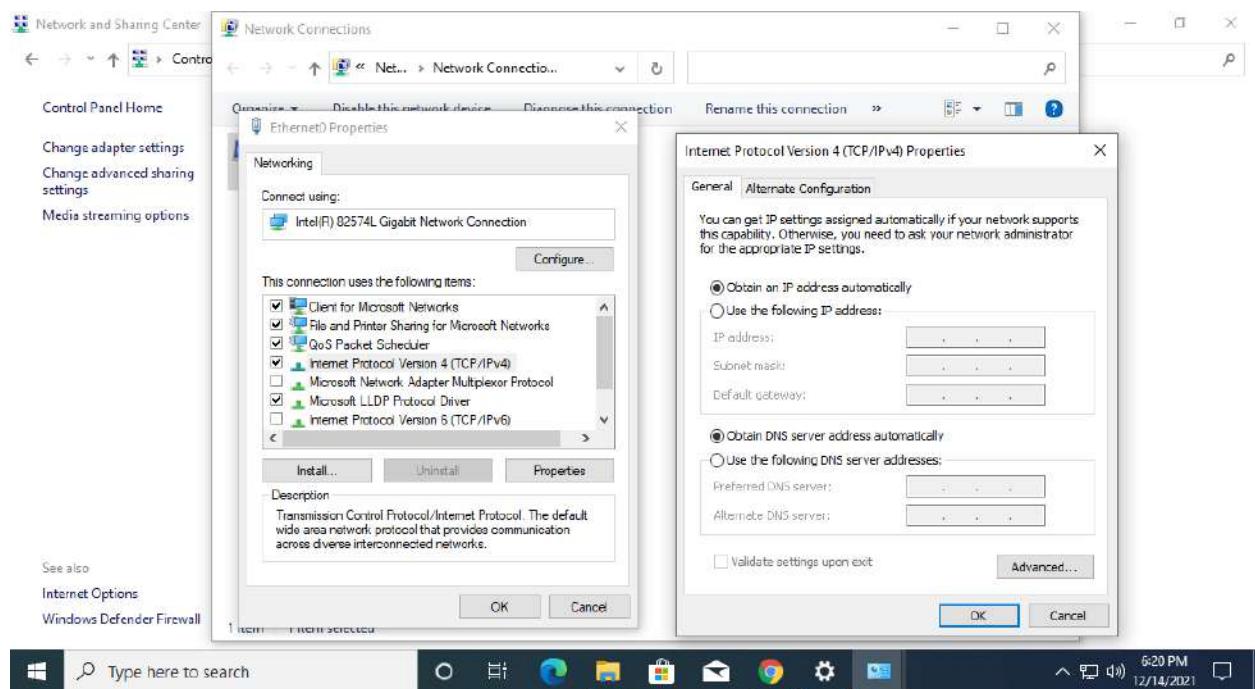
And Disable the Internet Protocol Version 6

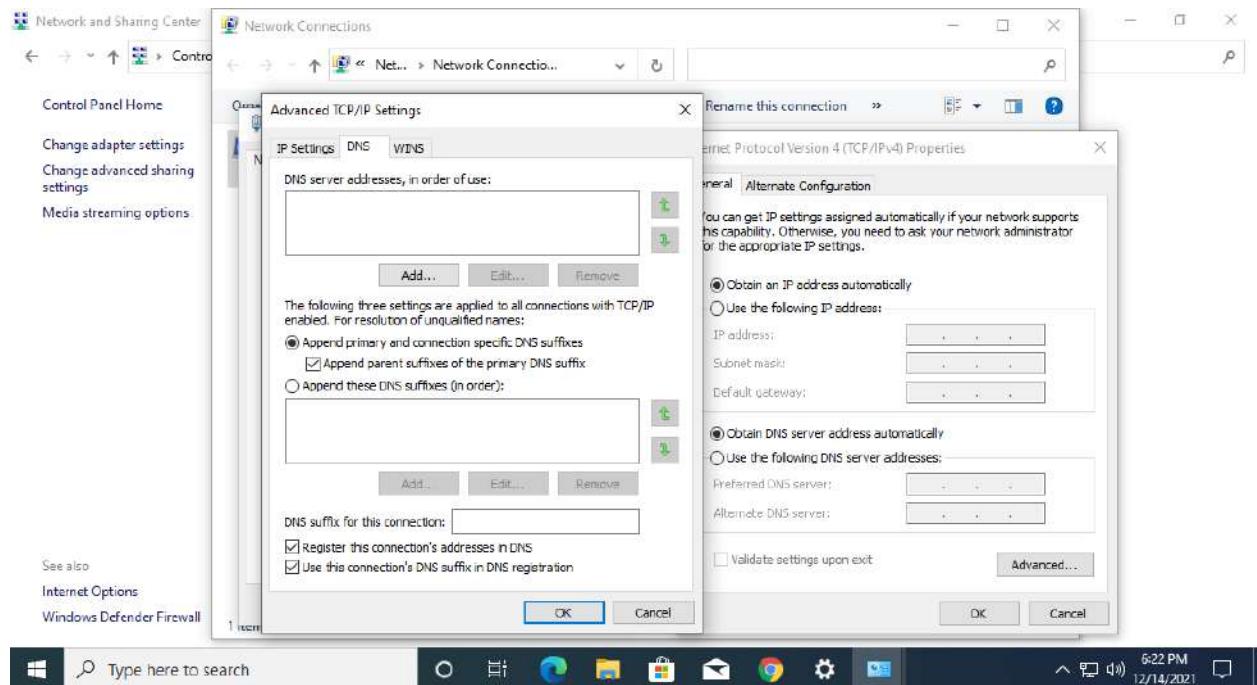




Then go to your IPV4 double click on it.

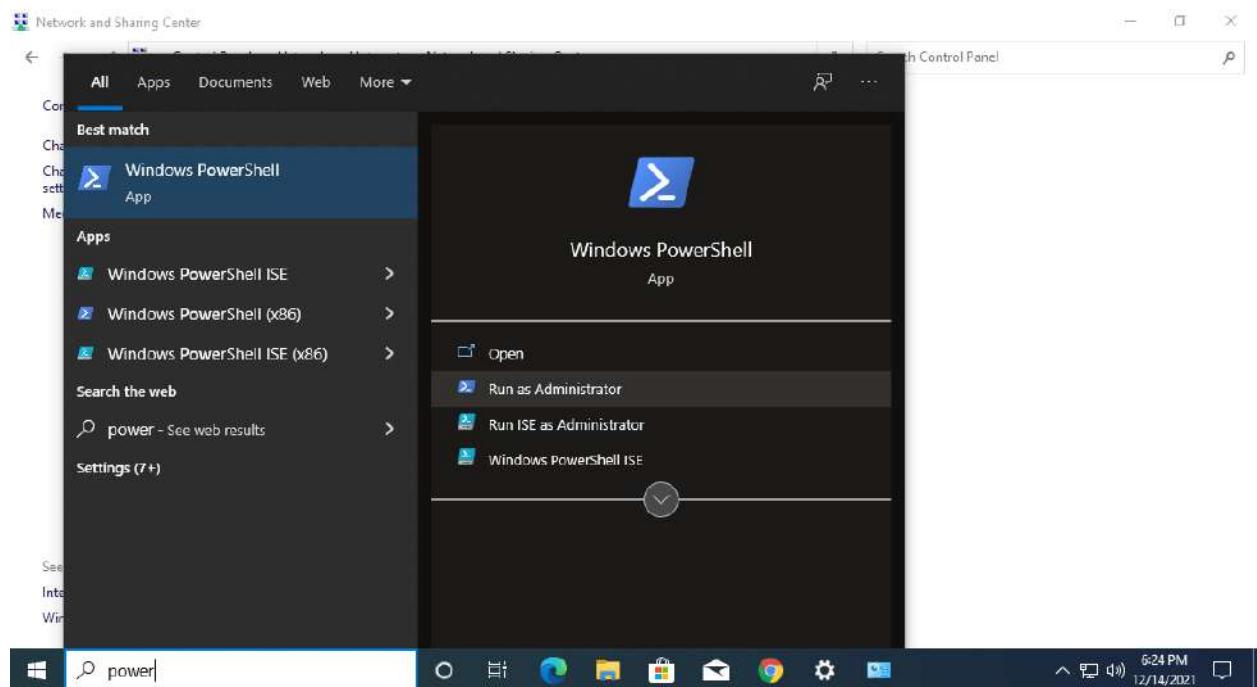
Go to Advanced – DNS – Both of the settings at the bottom of window should be checked.



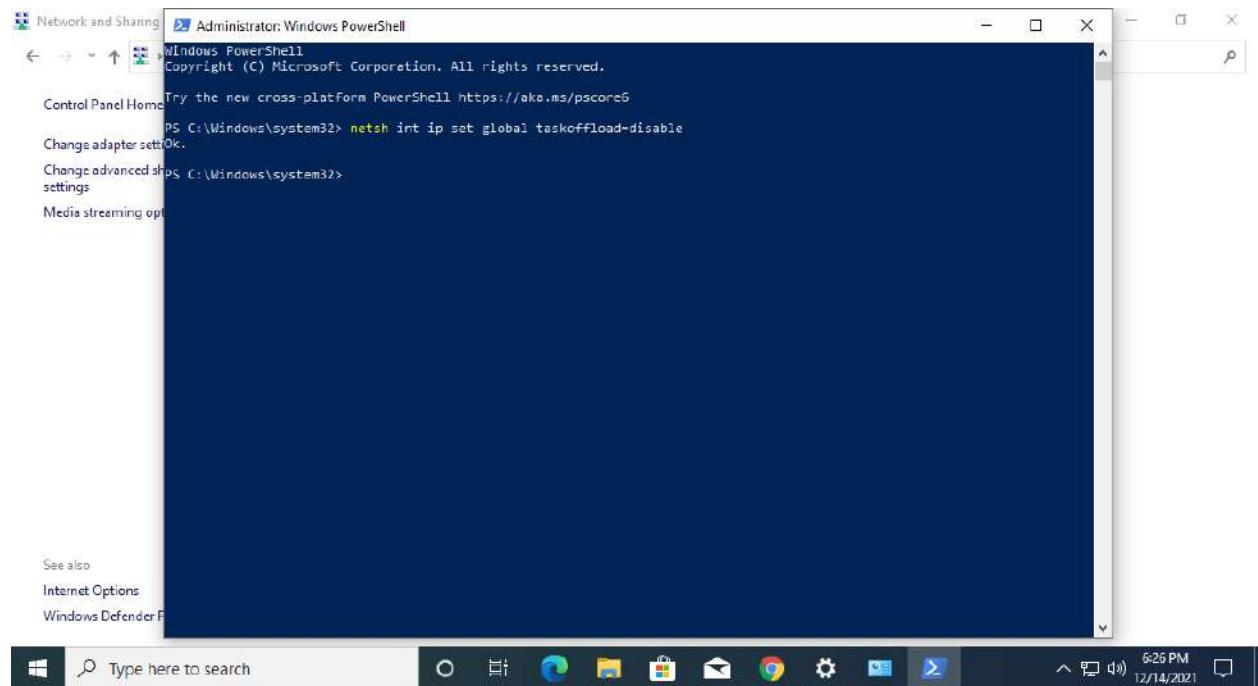


Whichever network adapter you are going to use, you need to do these settings for that network adapter.

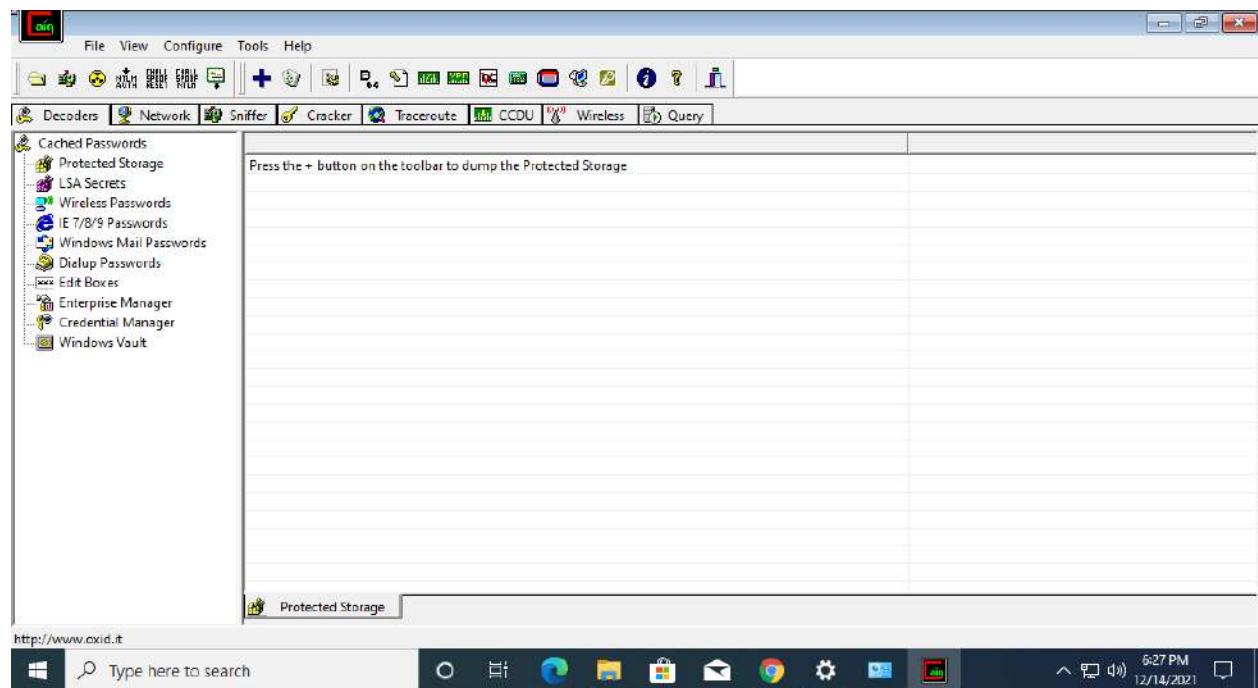
Once you done that open Powershell. Run it as an Administrator.



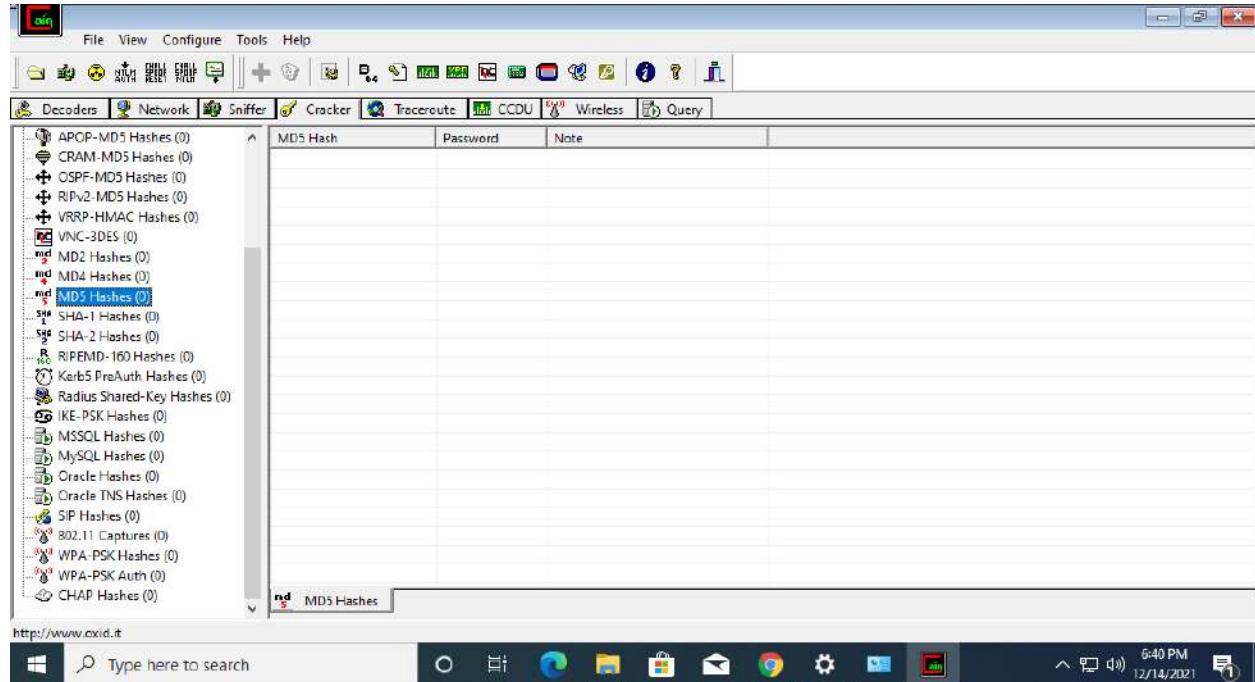
Type the command : netsh int ip set global taskoffload=disable and press enter.



Then run the CainAbel application.

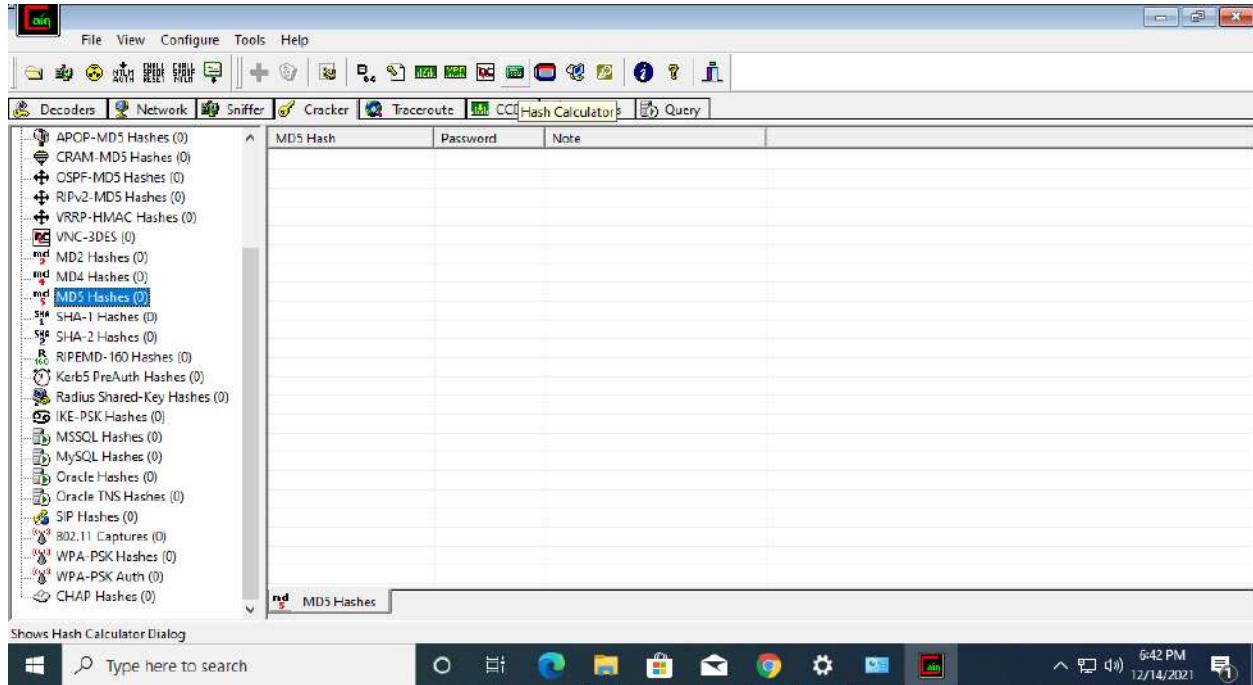


Select the “Cracker” tab with the key symbol, then click on MD5 hashes.
The result should look like the image below.

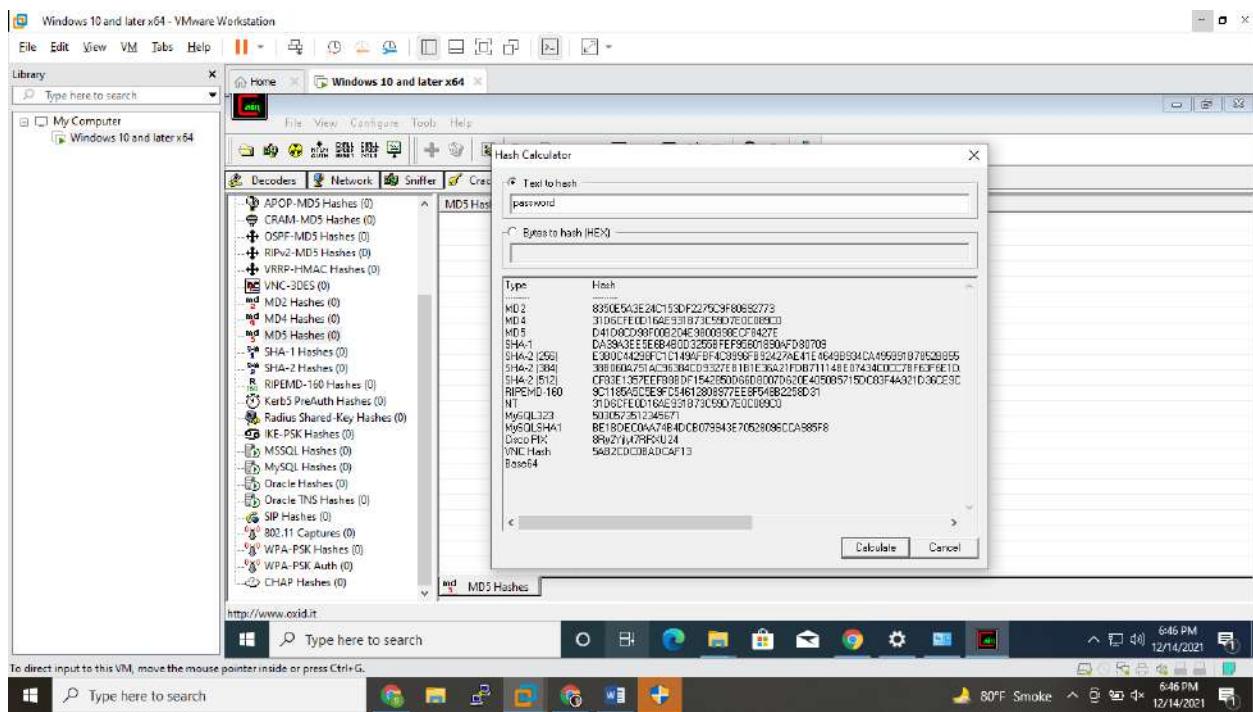


As you have might noticed we don't have any passwords to crack. Thus for the next few steps we will create our own MD5 encrypted passwords.

First locate the hash calculator among a row of icons near the top. Open it.



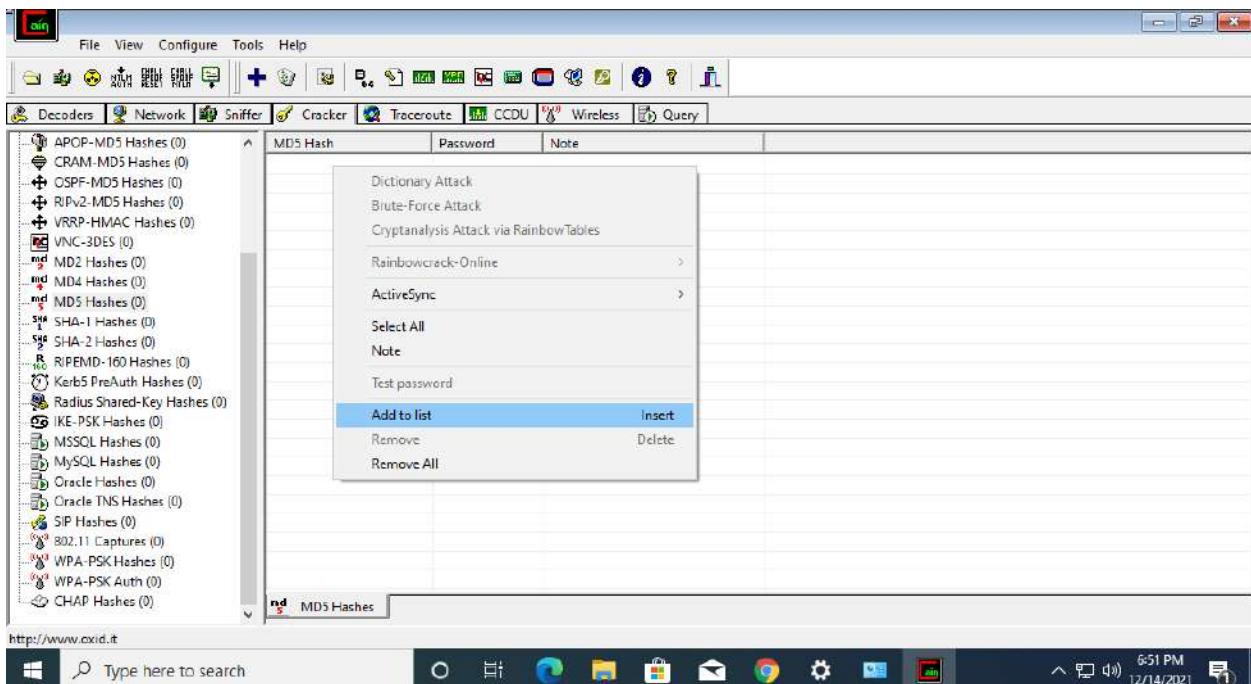
Next type password into text to hash text box. And click on calculate.



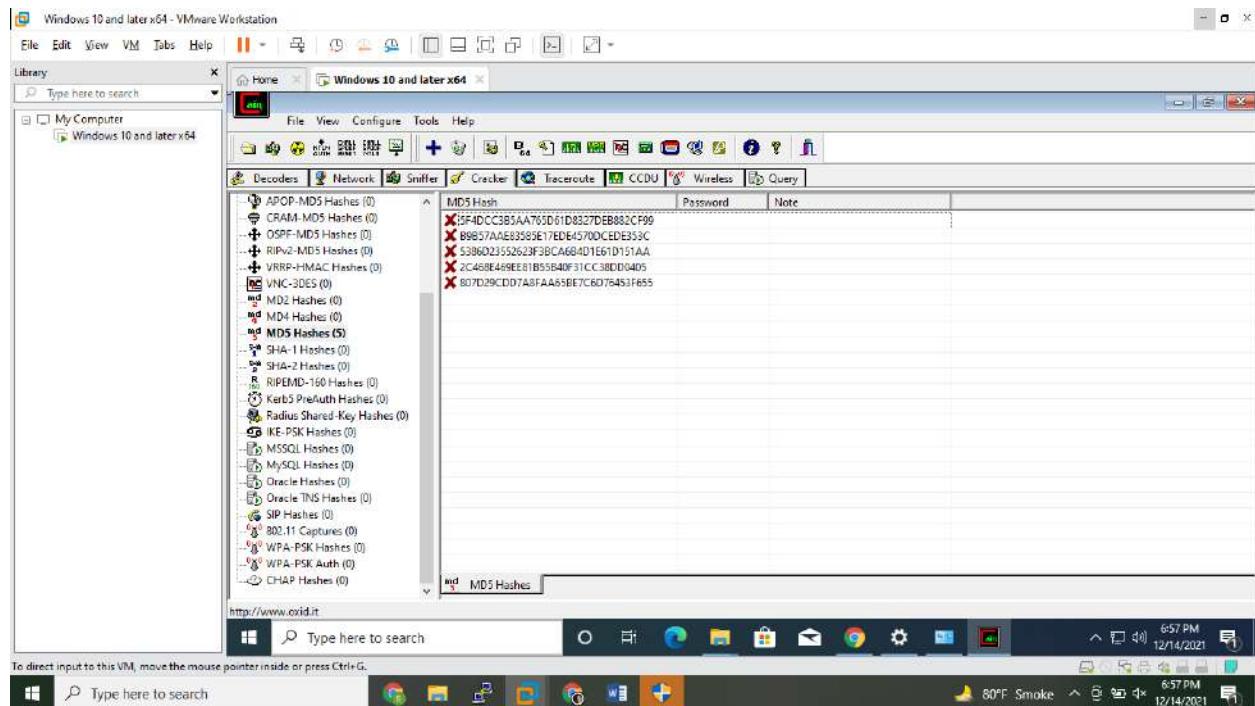
It will generate a list of hases pertaining to different type of hash algorithms. We will be focusing on MD5 hash so copy it. Then exit calculator by clicking cancel.

(Hashes are case sensitive so any slight changes to the text will change the hashes generated, try changing a letter or two and you will see. This is called avalanche effect.)

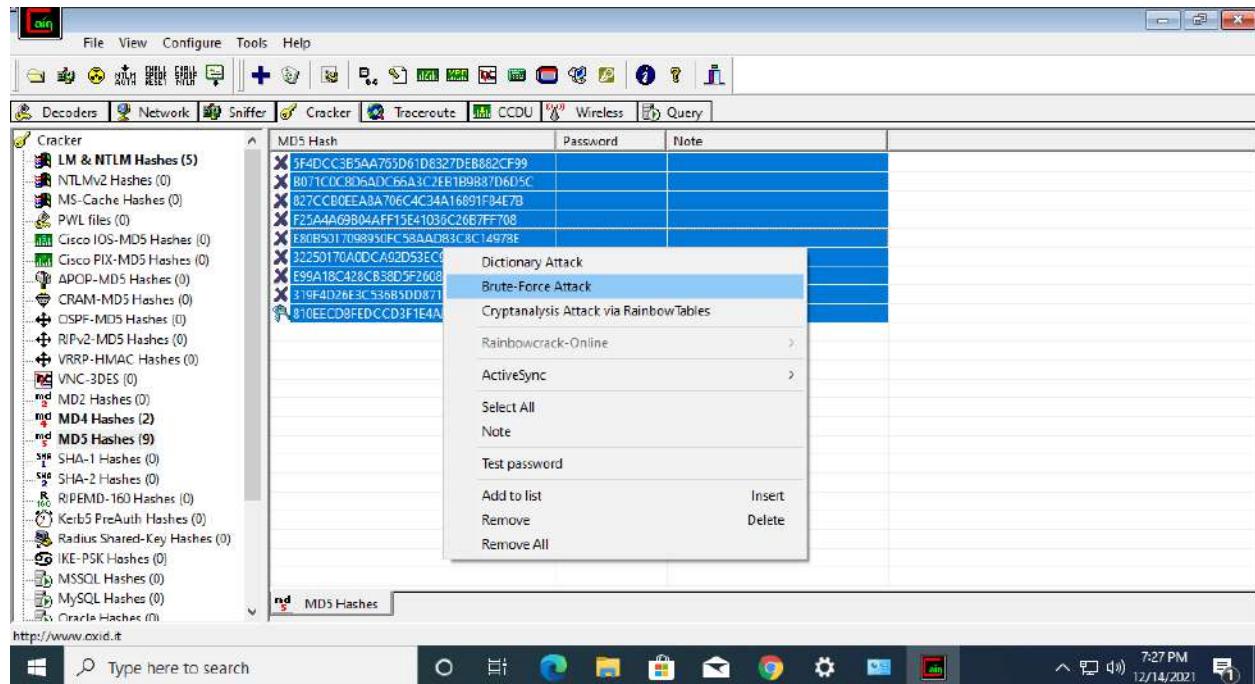
After you exit, right click and select 'Add to list', paste your hash then click Ok.
Your first encrypted password.

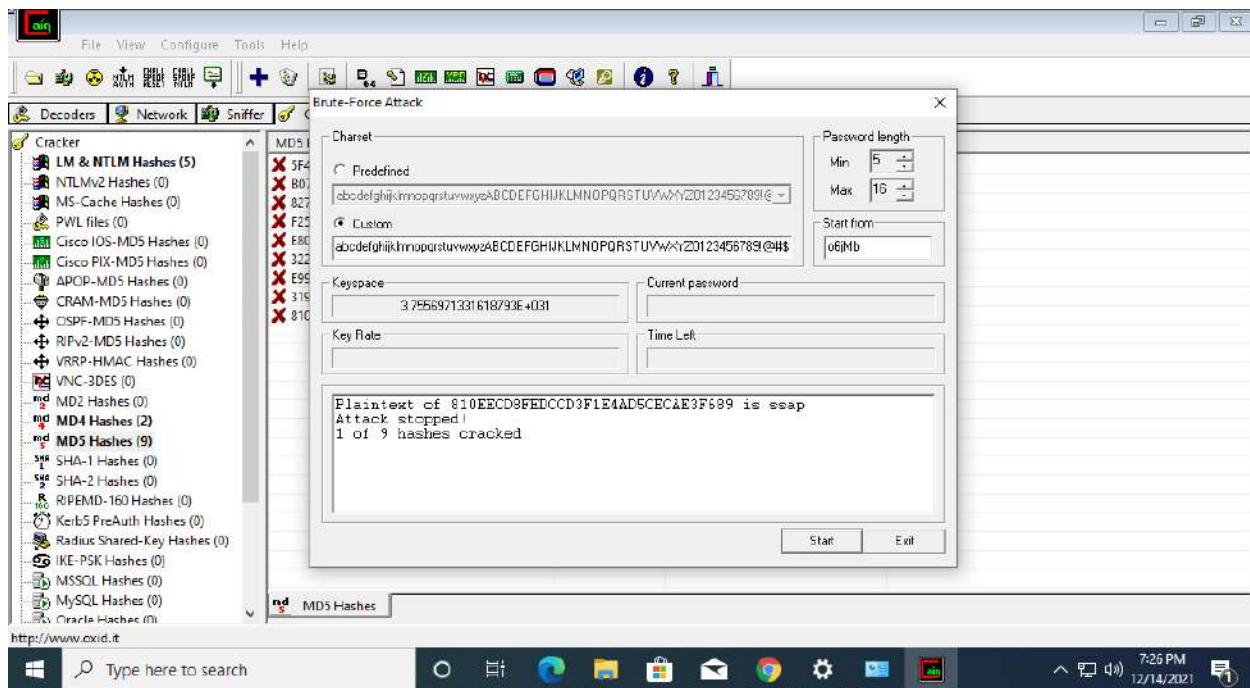


Add few more password : PaSS, ronnie, ssap, 12345, abcde.

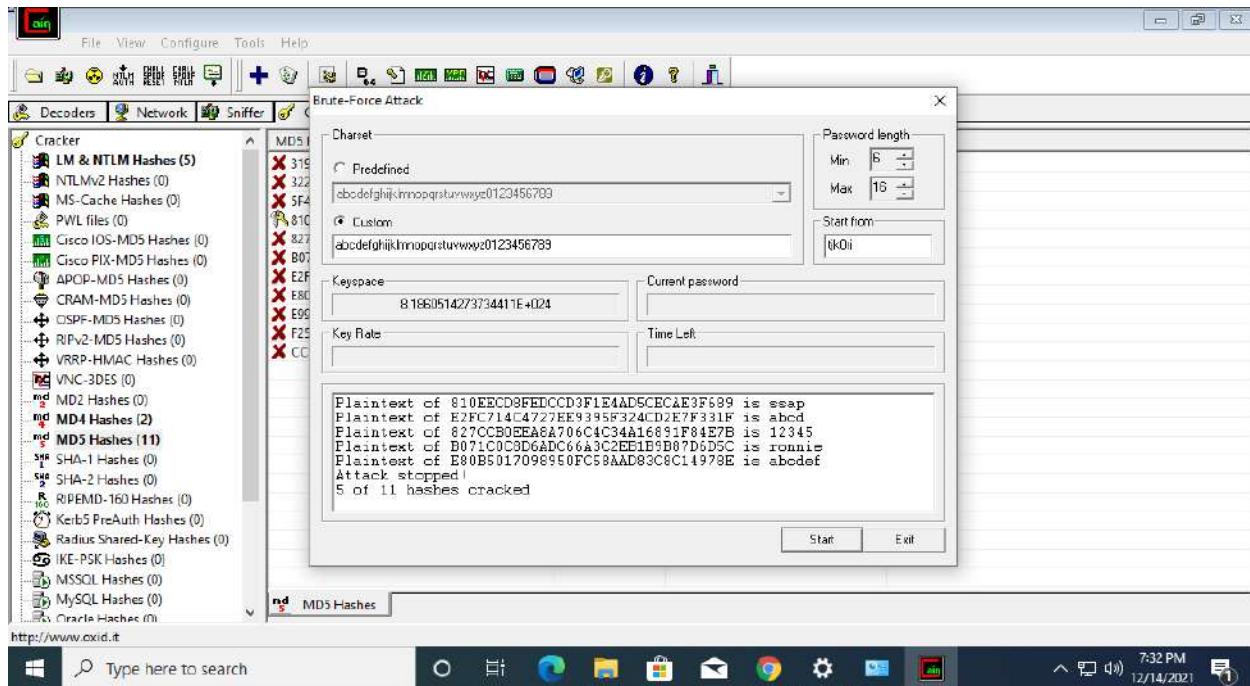


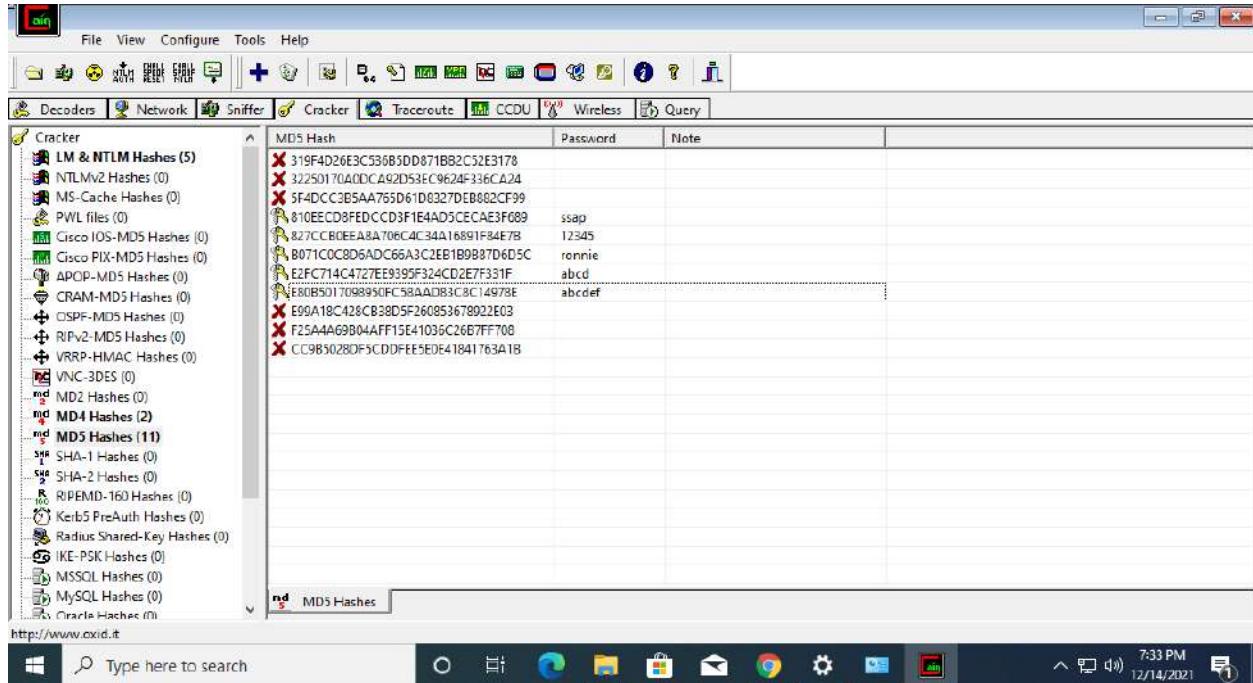
With all the encrypted MD5 password on hand, we can finally start ! Move your cursor and select all the passwords, then right click and press 'Brute Force Attack'.





As you can see the last entered password ssap was cracked. After some time more passwords has been cracked by Brute force attack.





Softwares Drive Link :-

<https://drive.google.com/drive/folders/1wLsniO3NLhkoEUo5FRLcH5BFUnfqhRwV?usp=sharing>

Practical No. 11

Aim: Managing Remote Registry, Network Enumeration, Services, s. IDs [Cain and Abel]

What is Remote Registry?

The Remote Registry service enables remote users who have the appropriate permissions to modify registry settings on the domain controller. The service's default configuration allows only members of the Administrators and Backup Operators groups to access the registry remotely. This service is required for the Microsoft Baseline Security Analyzer (MBSA) tool. MBSA enables you to verify which patches are installed on each of the servers in your organization.

If the Remote Registry service stops, only the registry on the local computer can be modified. If you disable this service, any services that explicitly depend on the service cannot start, but registry operations on your local computer are not affected. However, other computers or devices cannot connect to your local computer's registry.

This service is installed by default, and its startup type is **Automatic**.

The Remote Registry service is dependent upon the following system components:

When the Remote Registry service is started in its default configuration, it logs on by using the Local Service account.

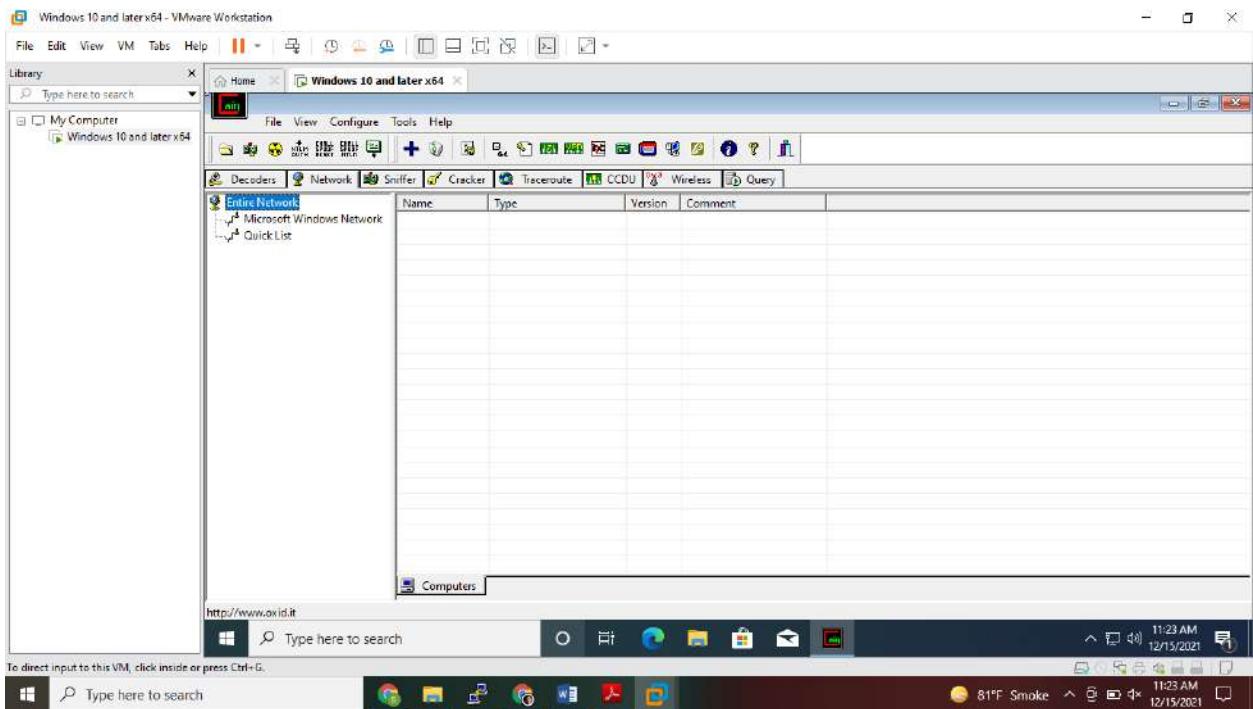
- Remote Procedure Call (RPC)
- DCOM Server Process Launcher
- RPC Endpoint Mapper

What Does Network Enumeration Mean?

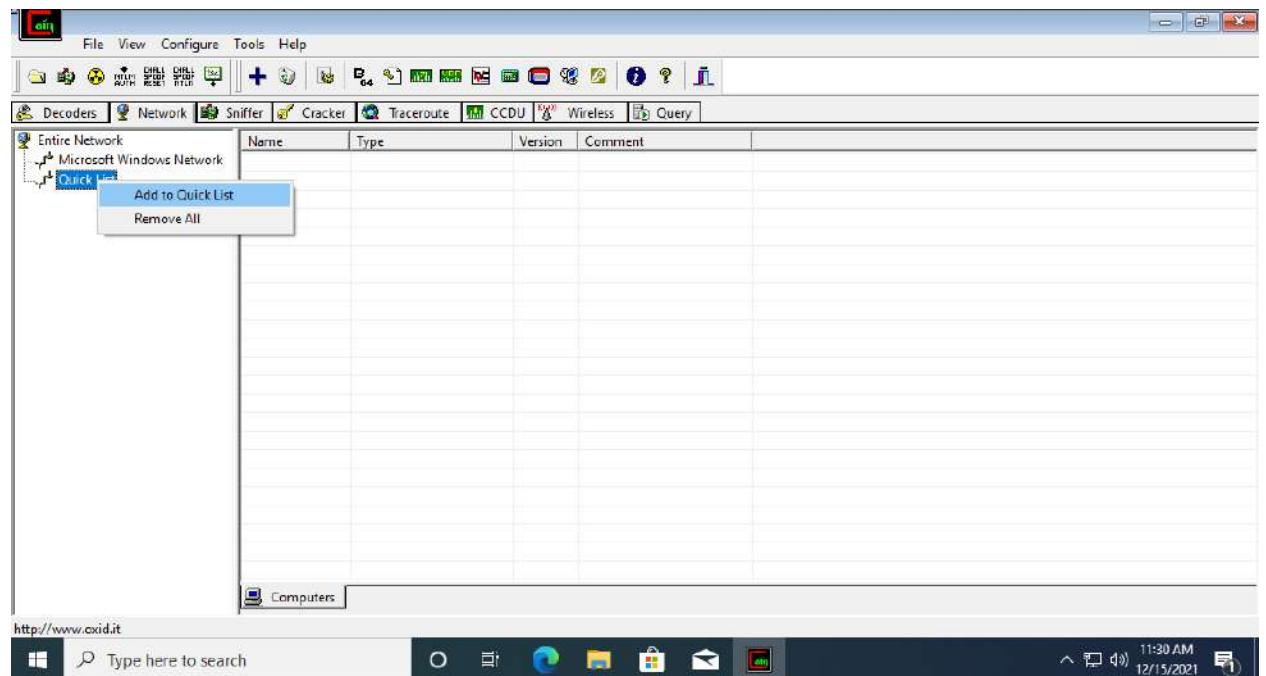
Network enumeration is a process that involves gathering information about a network such as the hosts, connected devices, along with usernames, group information and related data. Using protocols like ICMP and SNMP, network enumeration offers a better view of the network for either protection or hacking purposes.

Steps:

- 1) Start your virtual machine. Run the CainAbel as an administrator.
- 2) Go to Network tab.

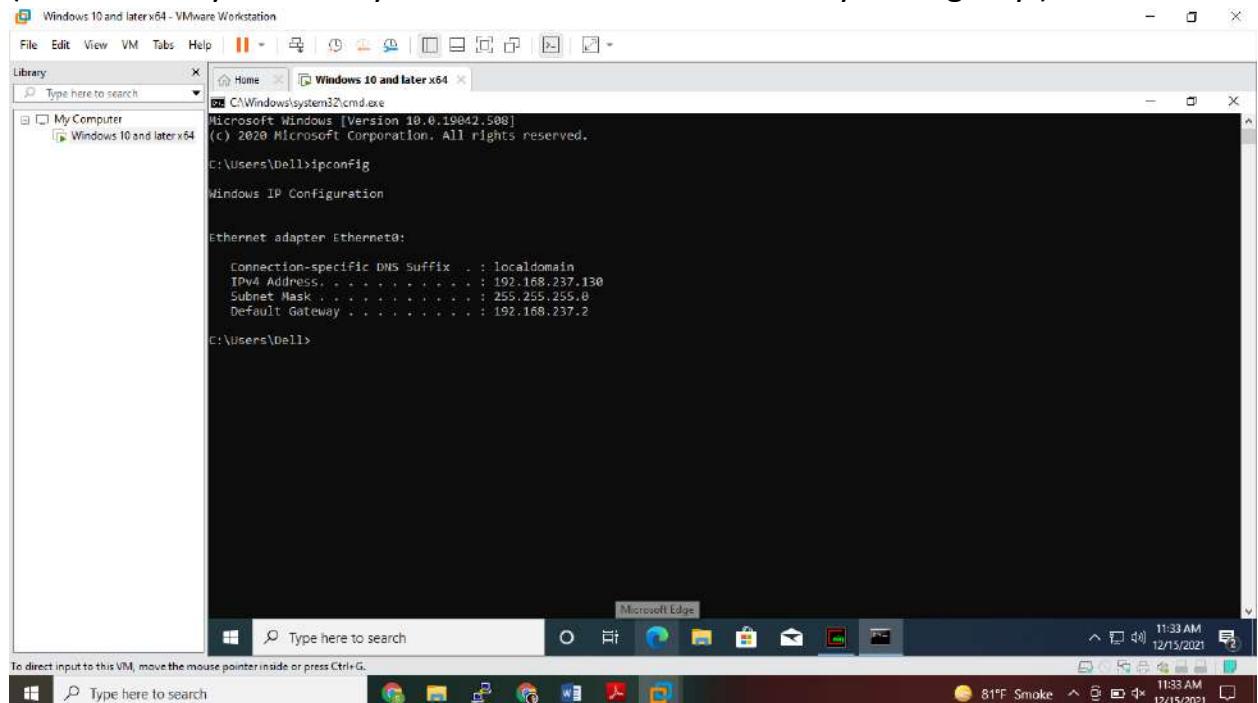


- 3) Expand entire network.
- Right click on Quick list & select add to quick list.



- 4) In the resulting popup box, enter the ip address of the system you want to study.

(You can use your ows system's IP address to examine your registry.)



Windows 10 and later x64 - VMware Workstation

File Edit View VM Tabs Help

Library Type here to search

My Computer Windows 10 and later x64

Windows 10 and later x64

C:\Windows\system32\cmd.exe

Microsoft Windows [Version 10.0.19042.508]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\Dell>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet0:

Connection-specific DNS Suffix . : localdomain
IPv4 Address : 192.168.237.130
Subnet Mask : 255.255.255.0
Default Gateway : 192.168.237.2

C:\Users\Dell>

Microsoft Edge

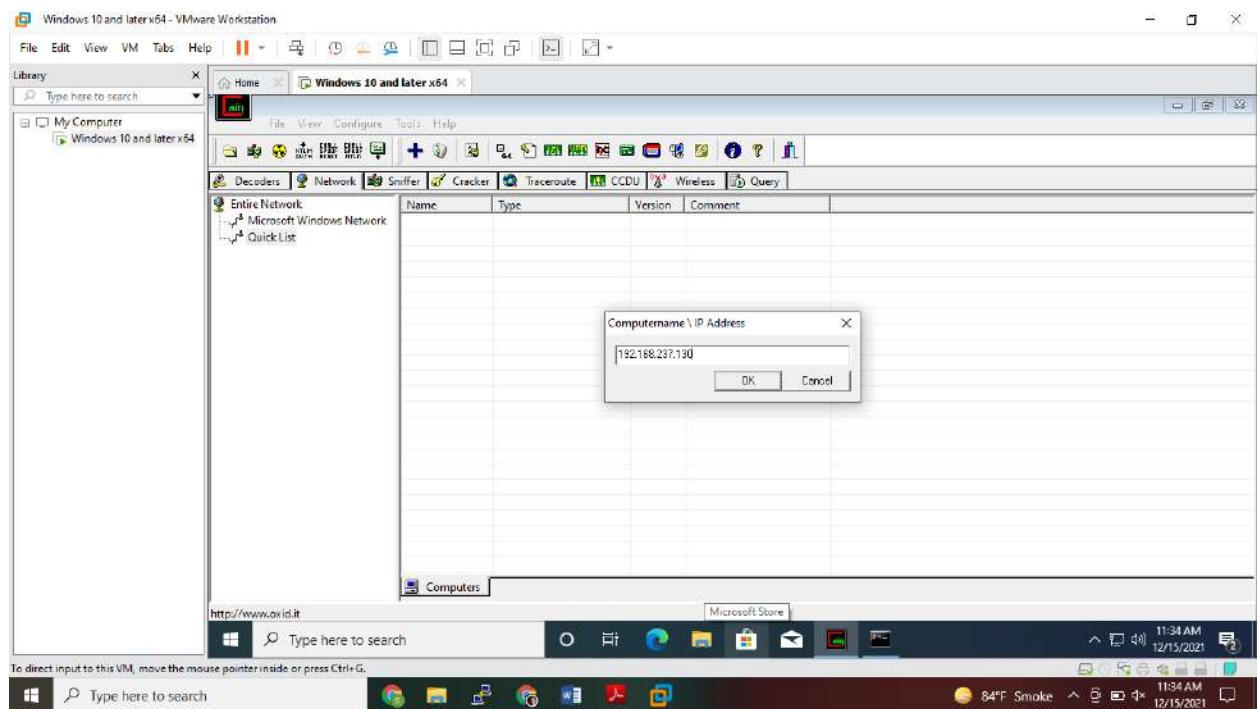
Type here to search

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

11:33 AM 12/15/2021

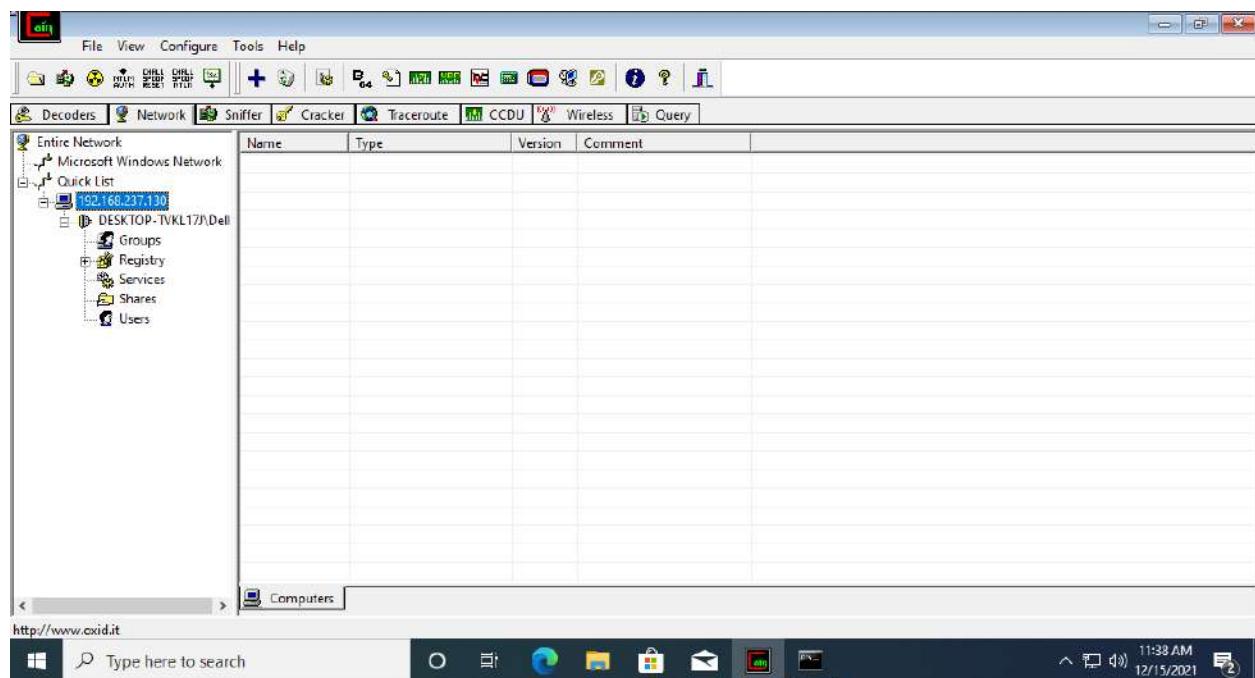
81°F Smoke 11:33 AM 12/15/2021

Click on Ok



To Access Other System's Registry & Services, Use That System's IP Address
Right Click On The Account And Enter User Credentials (Necessary Only If
Using Accessing Other System)

- 5) Double Click To Expand, This Will Provide Access To The
 - a. Groups
 - b. Registry
 - c. Services
 - d. Shares
 - e. Users

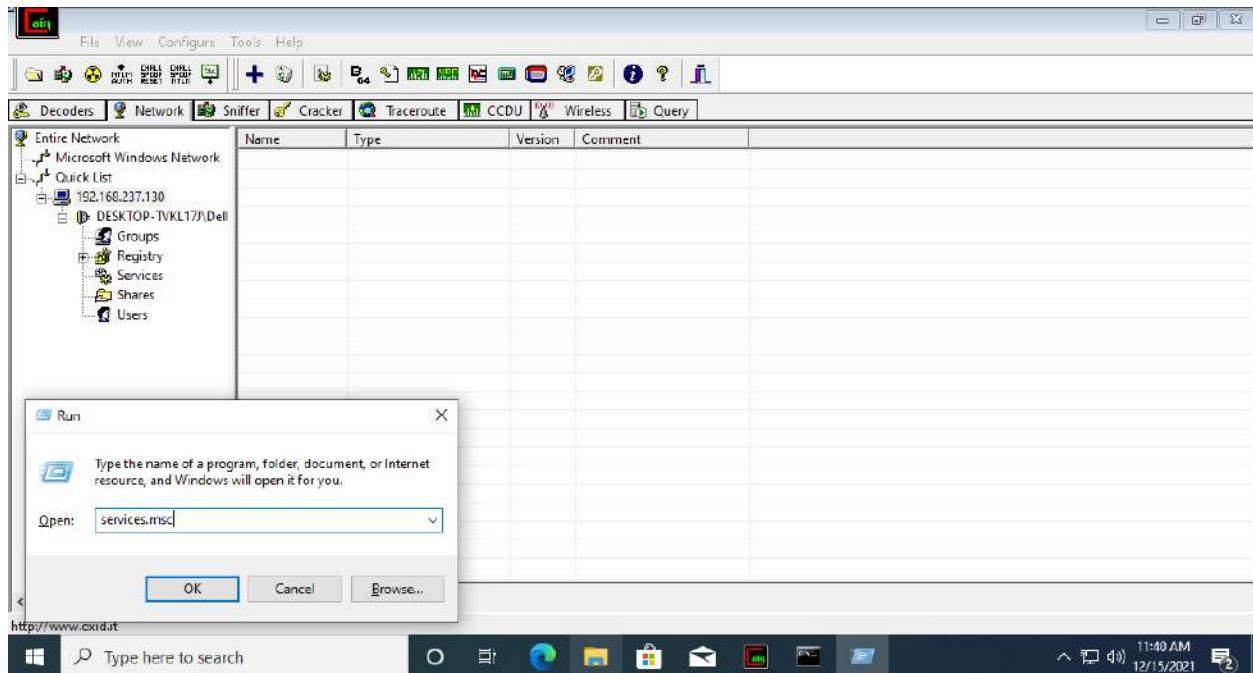


- 6) Make Sure To Start 'Remote Registry' Service In Both The PCs,
Including Yours & The System You Are Investigating At.

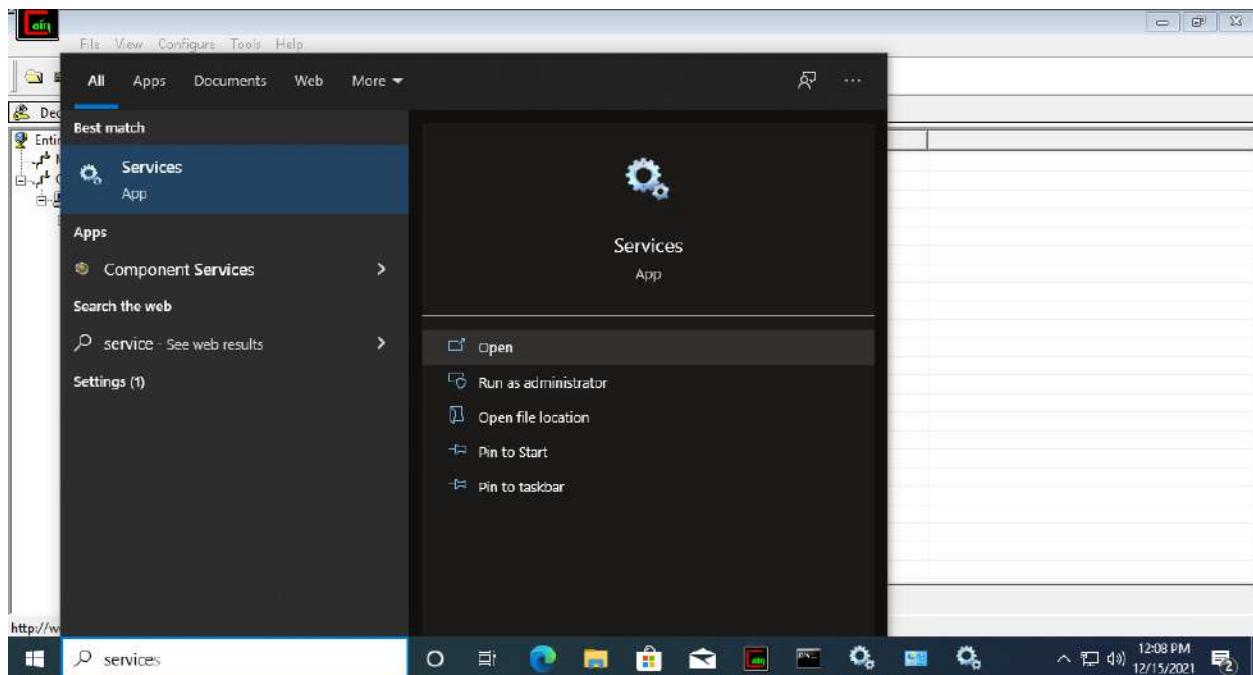
Do Windows + R & Type services.msc

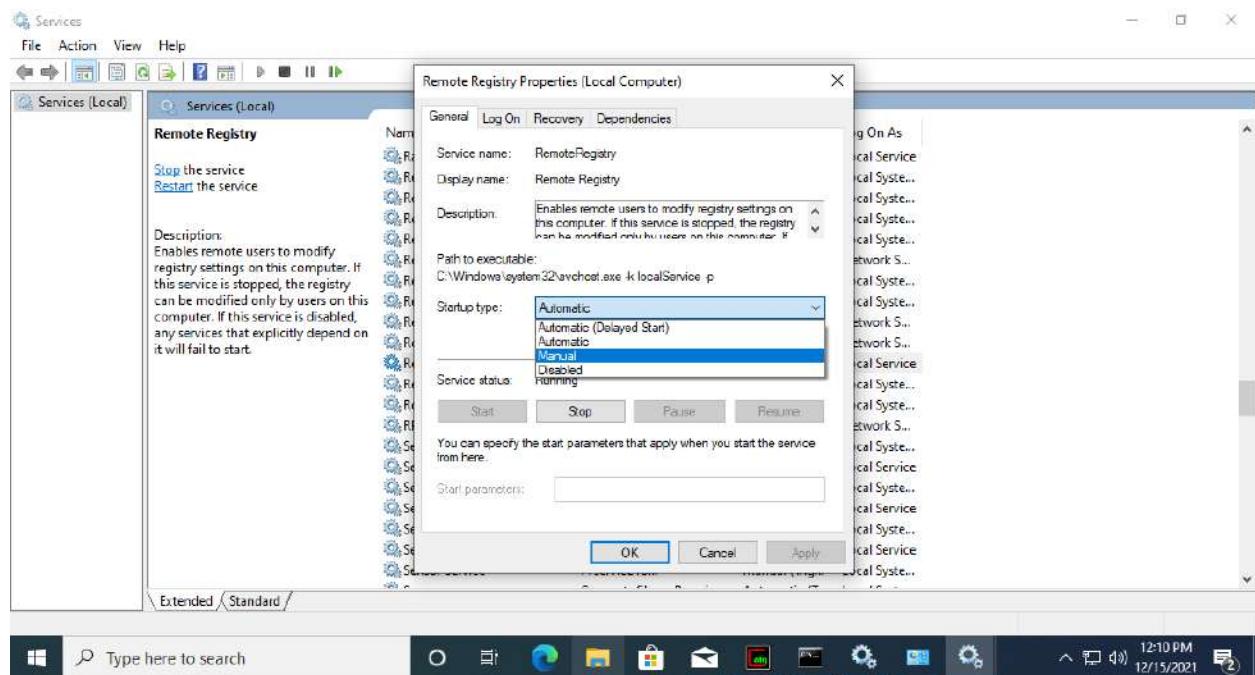
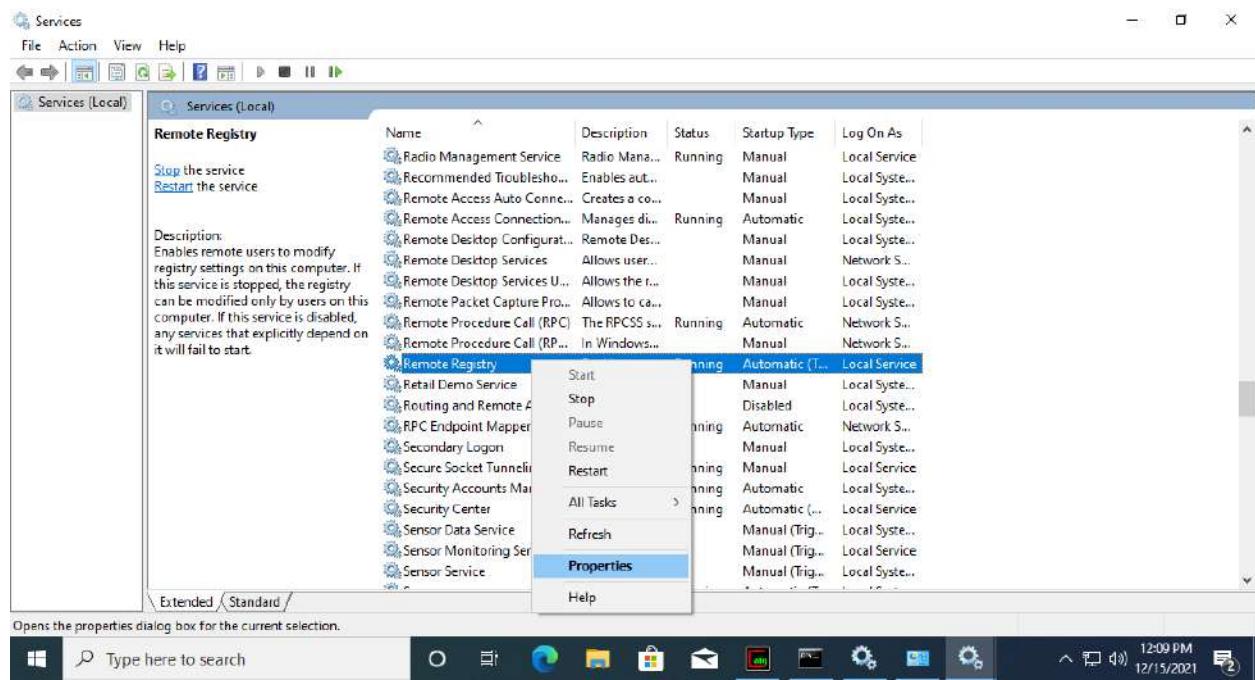
Start Remote Registry Service

7) You Can Make Changes In The Registry By Traversing Through The Folders



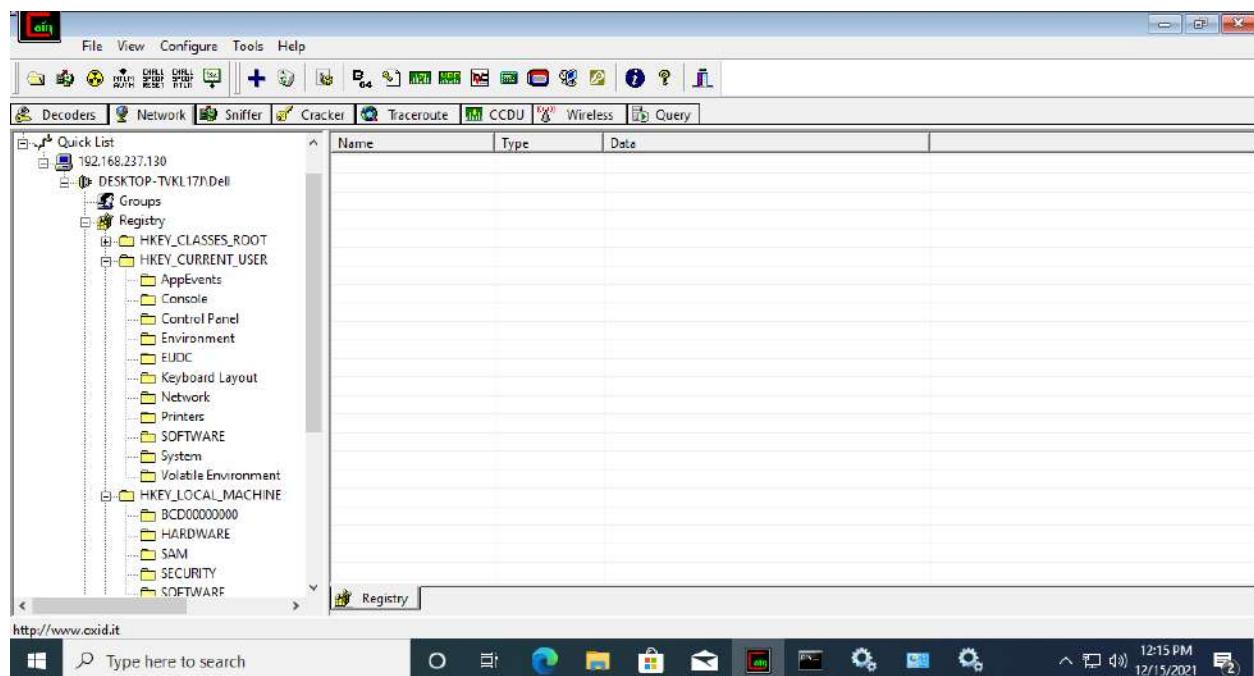
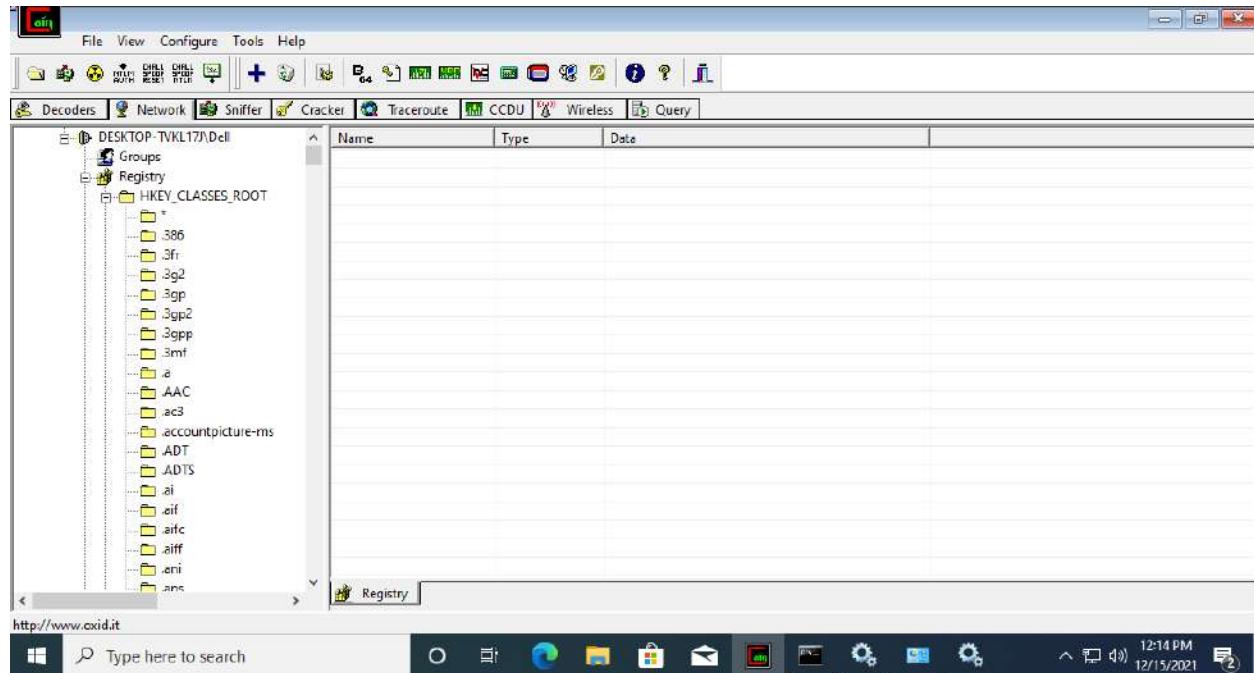
Open the services App – Remote Registry – Right click on it – Properties – Startup type should be Automatic – Then Click on ok and Then on Start.

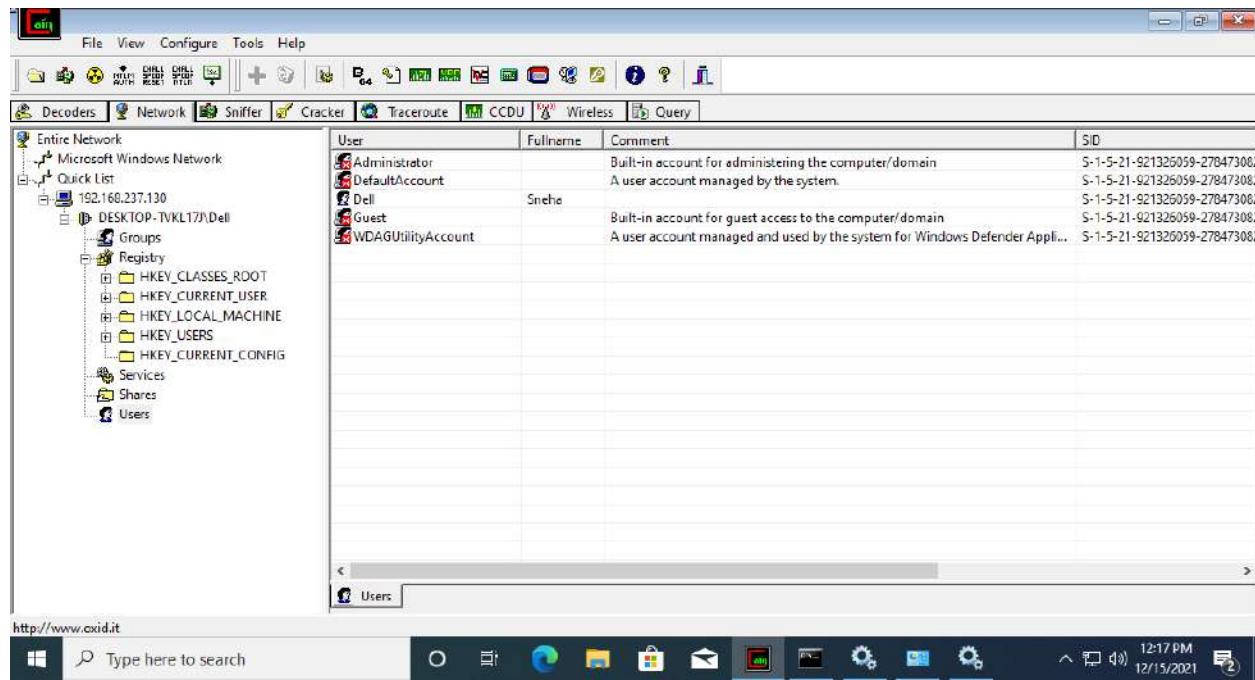




Changes Can Also Be Done In Services Section, Groups, Shares & Users (Network Enumeration) Can Be Viewed

As Well.





Practical No. 12

Aim: Investigating Website using FAW

What is FAW?

THE BEST PROTECTION FOR YOUR RIGHTS ON THE WEB

FAW (Forensics Acquisition of Websites) was born as a forensic browser for the acquisition of web pages with legal value.

FAW has been developed in compliance with national and international regulations, scientific papers and best practices of Digital Forensics.

IT TAKES AN ANALYTICAL AND COMPLETE PHOTOGRAPHY OF ANY CONTENT PRESENT ON THE NET

In order to obtain a valid and effective evidence in a judicial proceeding starting from web pages several acquisition technical aspect need to be considered. Indeed, it is necessary to comply with strict procedural legal rules as well as to follow best practices recognized by the forensic scientific community and experts on this field.

FAW is an innovative software simply to use. It guarantees a valid forensics acquisition method.

NEW FORM FOR THE ACQUISITION OF FACEBOOK PAGES

Expert witnesses and law enforcement agencies use FAW to extract digital evidences from the social network. It is possible to acquire complete profiles, comments, posts, photos and videos, friends, groups, likes and reactions, places, payment histories, saved collections, advertisements and information on access protection.

FORENSIC ACQUISITION OF YOUTUBE'S VIDEOS

With this module it is possible to automatically crystallize the test for legal purposes and legal value including all the texts, main video and all the multimedia elements.

CONCRETE AND UNCHANGED TESTS

FAW allows to obtain the legal proof and keep it safe with all the necessary security controls that guarantees to avoid any alteration of the data or “simply” to relies on as against third parties the authenticity of the data acquisition, thanks to the service offered by Namirial, which operates as a Certification Authority.

WHO USE FAW?

FAW is made for law enforcements, investigators, technical consultants, experts witnesses, notaries, lawyers, but also simple private individuals who ma encounter legal proofs, or important evidences, which could be easily wasted away / mutated / altered or lost, sometimes compromising the success of a “dispute”.

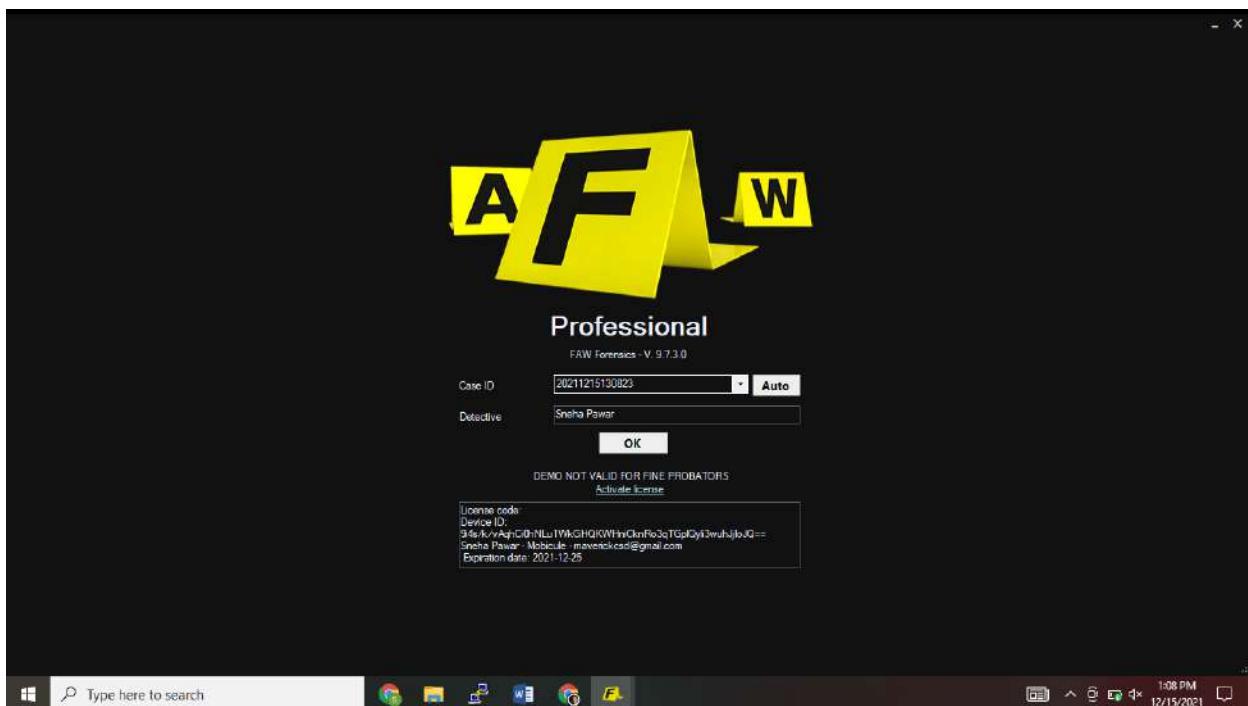
Download FAW software setup from following website and install:

While installing this software Npcap software will also get installed

<https://en.fawproject.com/download/>

Open FAW. Select your language, enter details, the application will start.

Generate Case ID Auto. Enter detector's name.

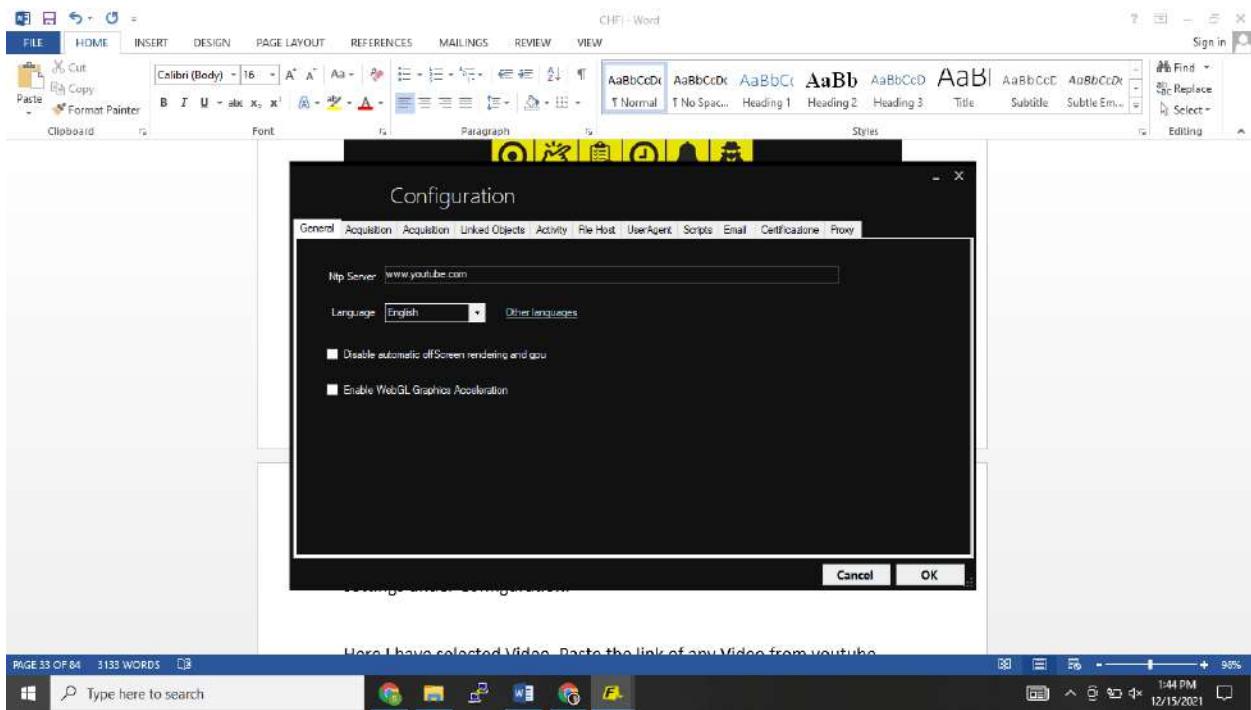


Select any social platform from below options.

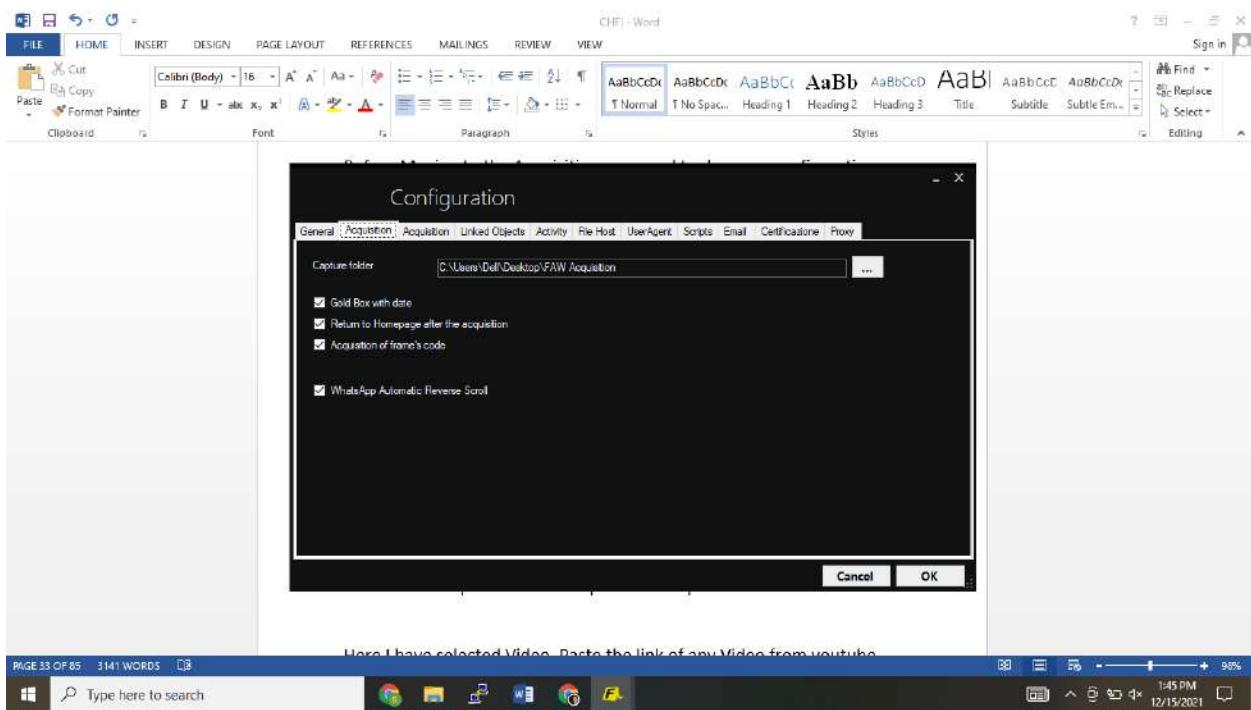


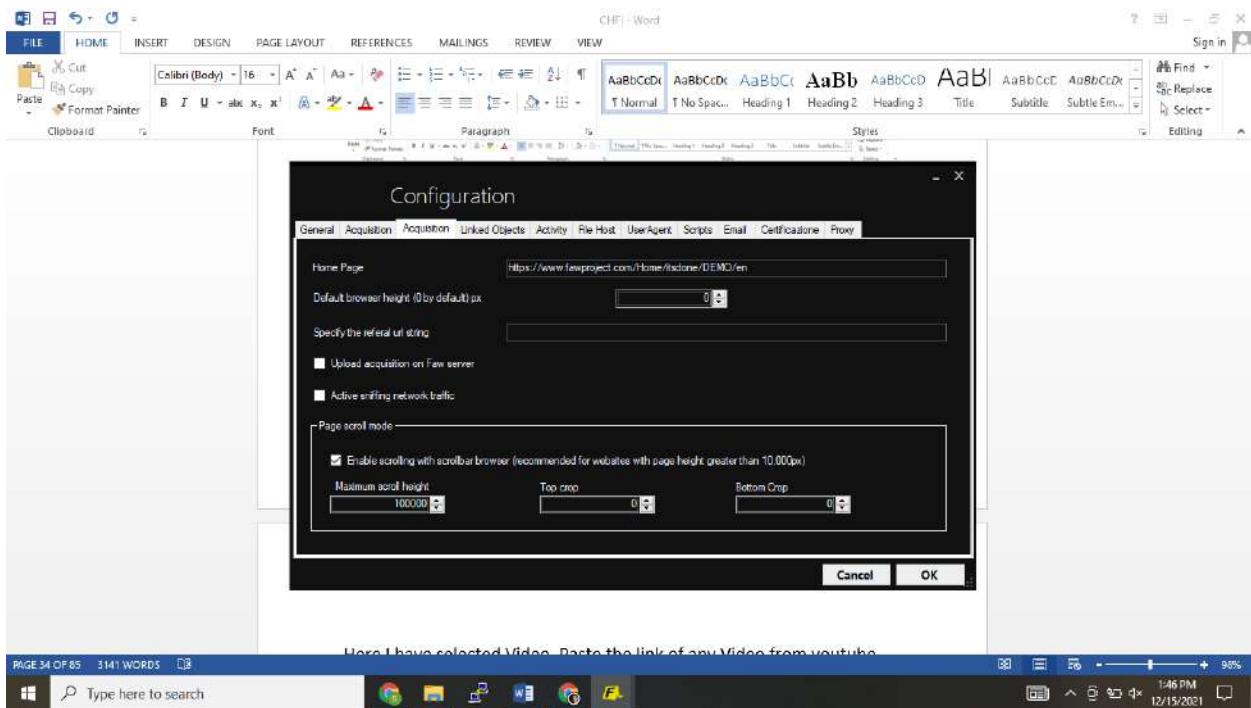
Before Moving to the Acquisition you need to do some configuration settings under Configuration.

General

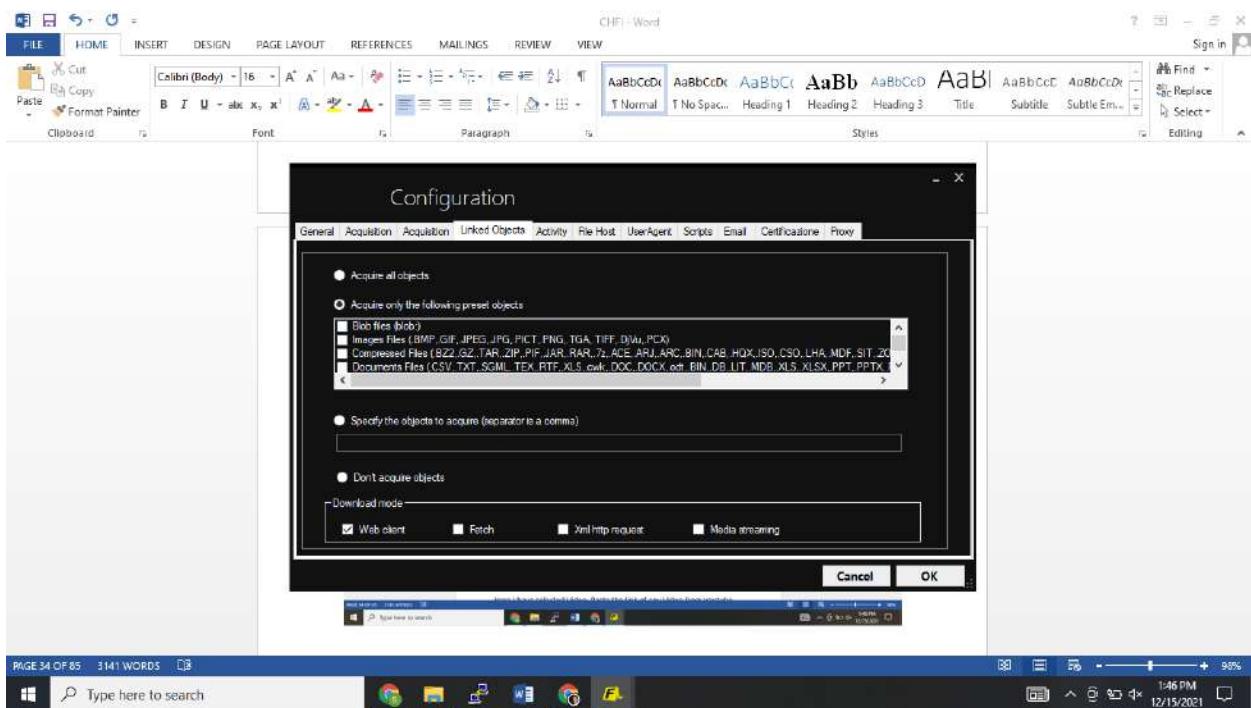


Then under acquisition enter capture folder path.

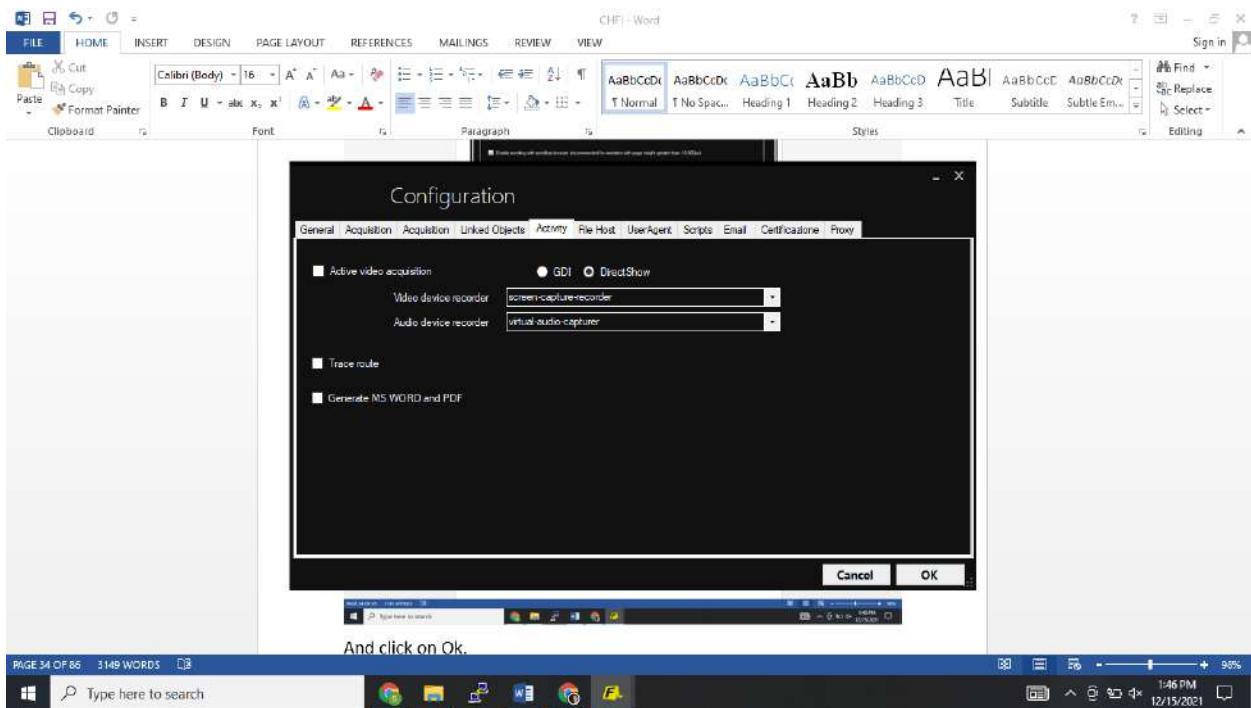




Under Linked Objects :



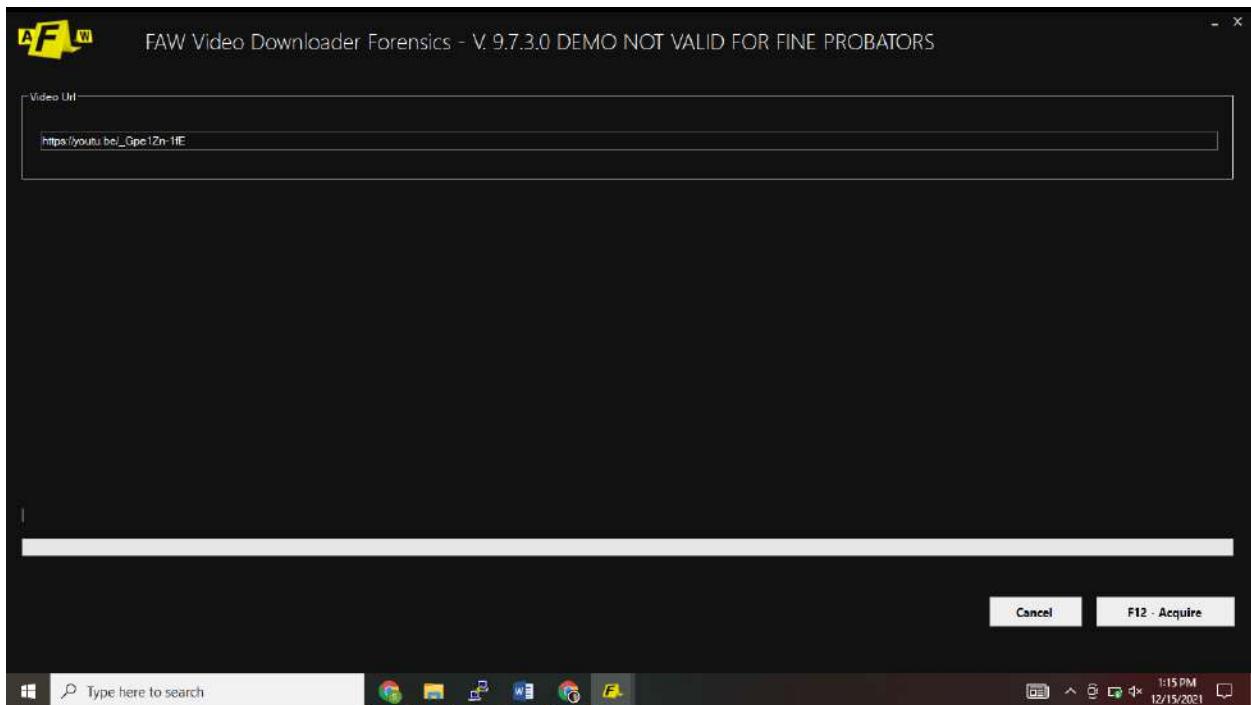
Under Activity tab



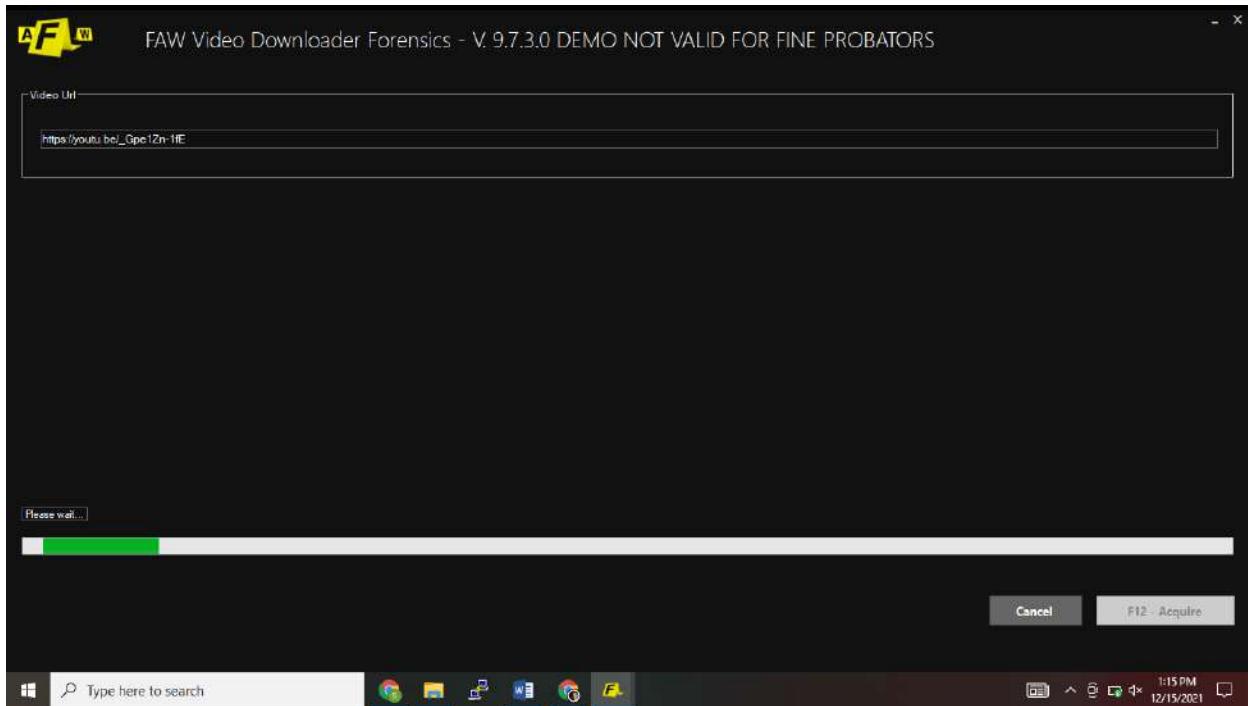
And click on Ok.

Then select option from various types. Here I have selected Video. Paste the link of any Video from youtube.

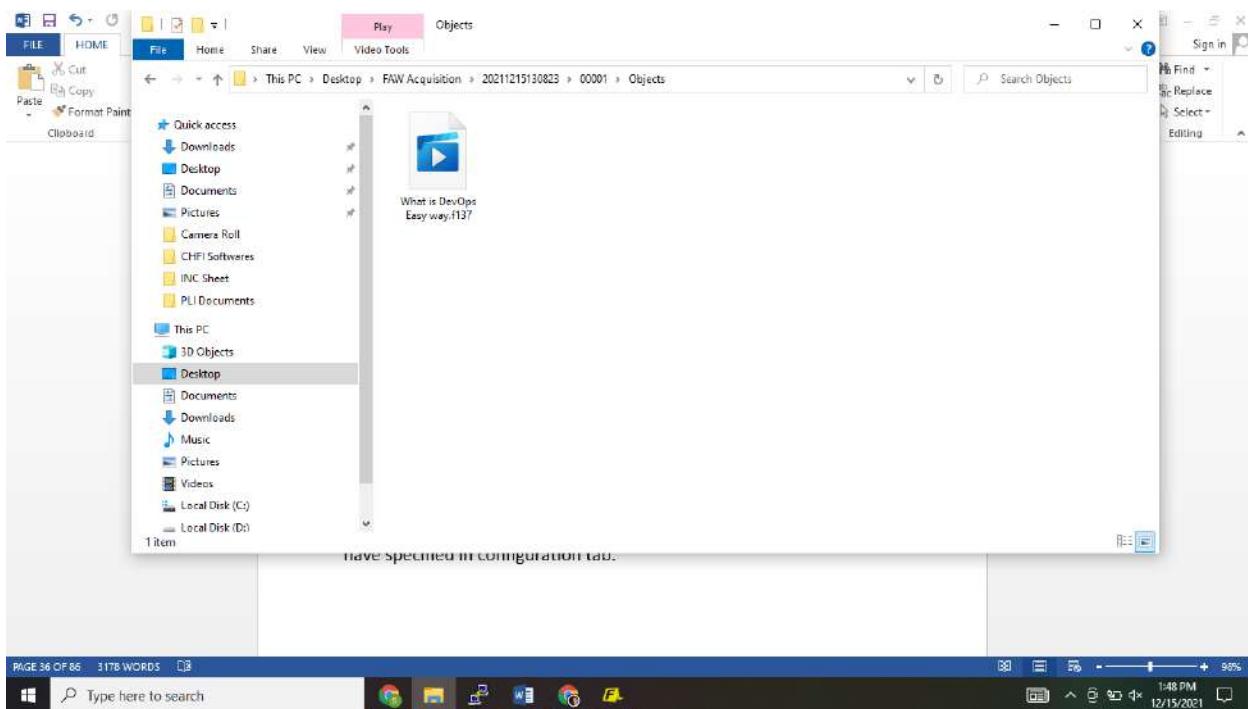
https://youtu.be/_Gpe1Zn-1fE

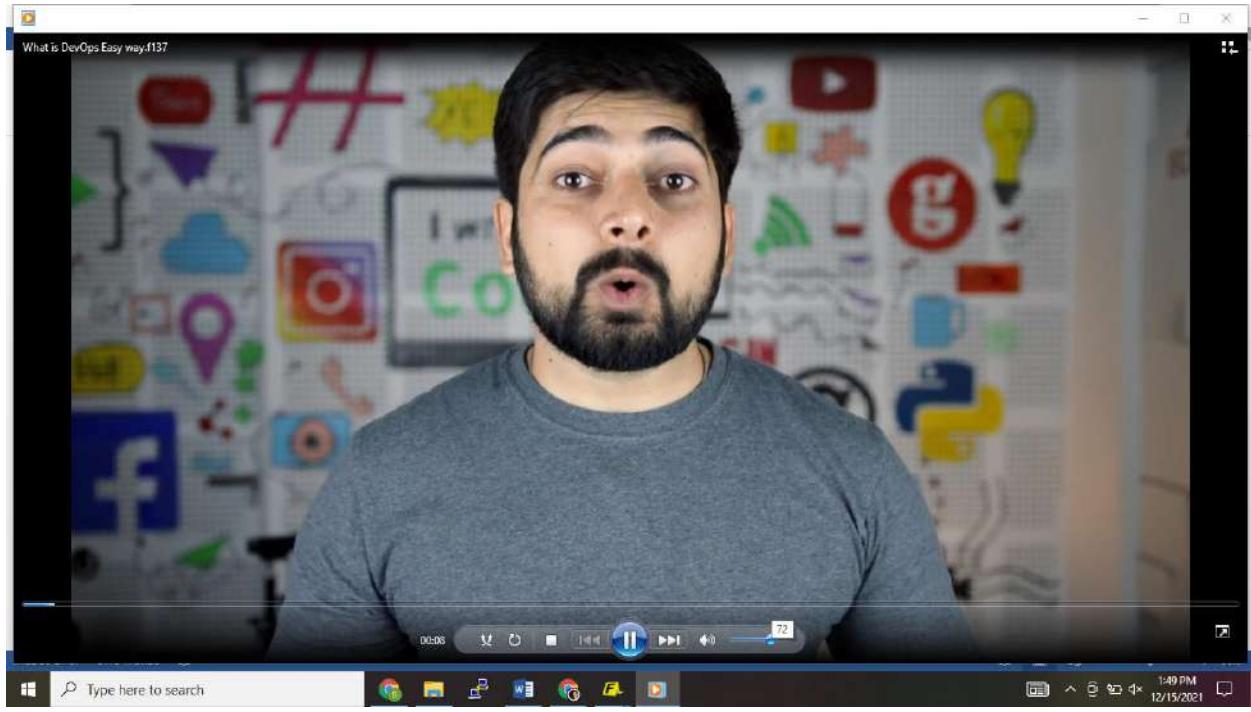


And click on F12 – Acquire.



You will get to see the entire video has got acquired in the folder you have specified in configuration tab.





Similarly you can do with other options.

Here I have acquired the content from instagram

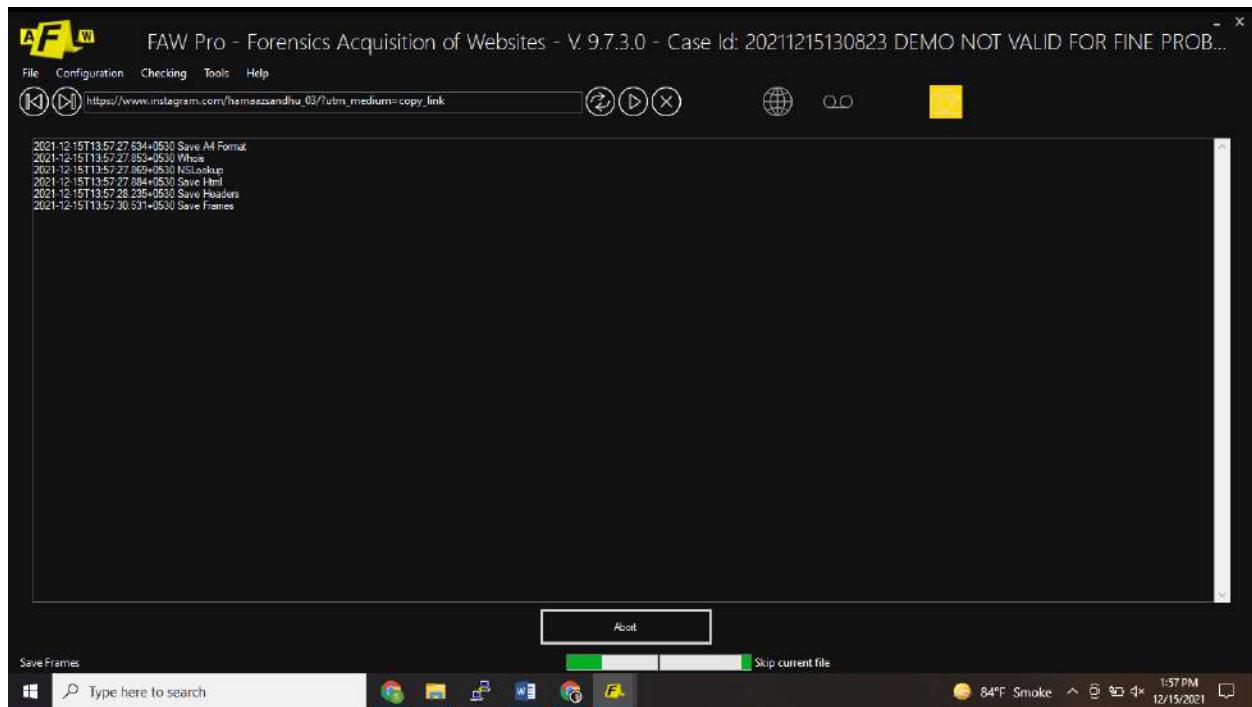
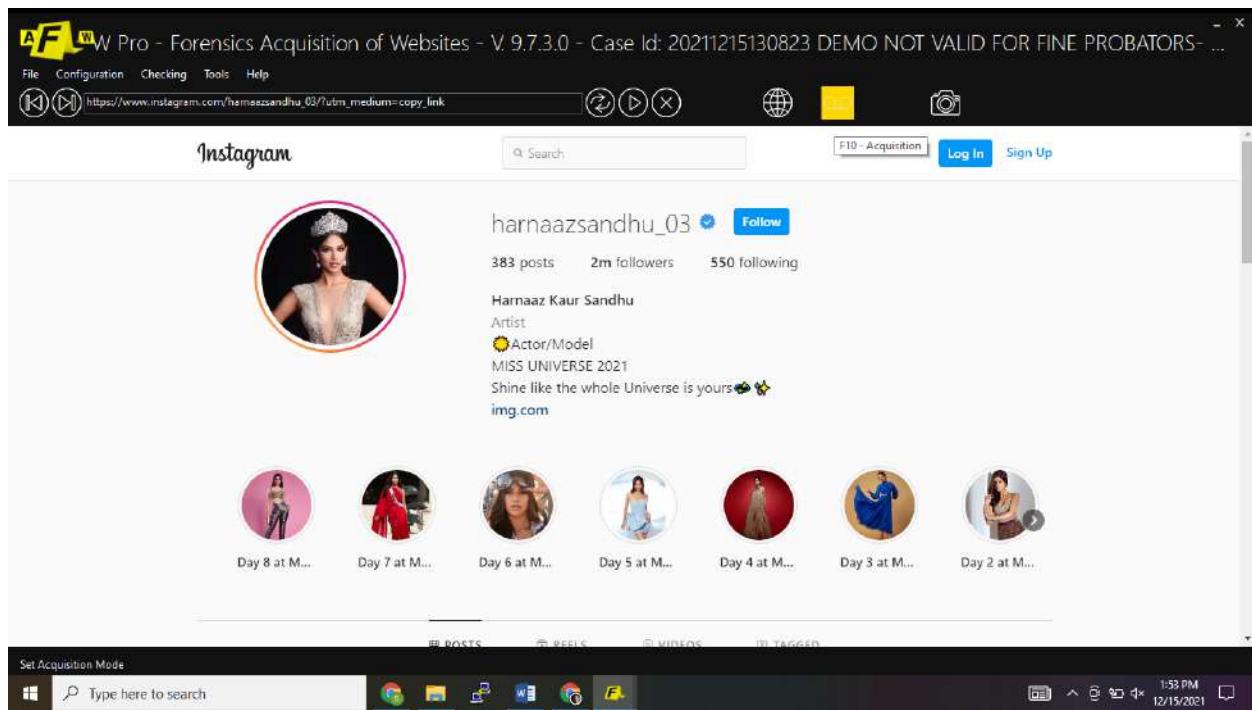
Select Instagram option and paste the link

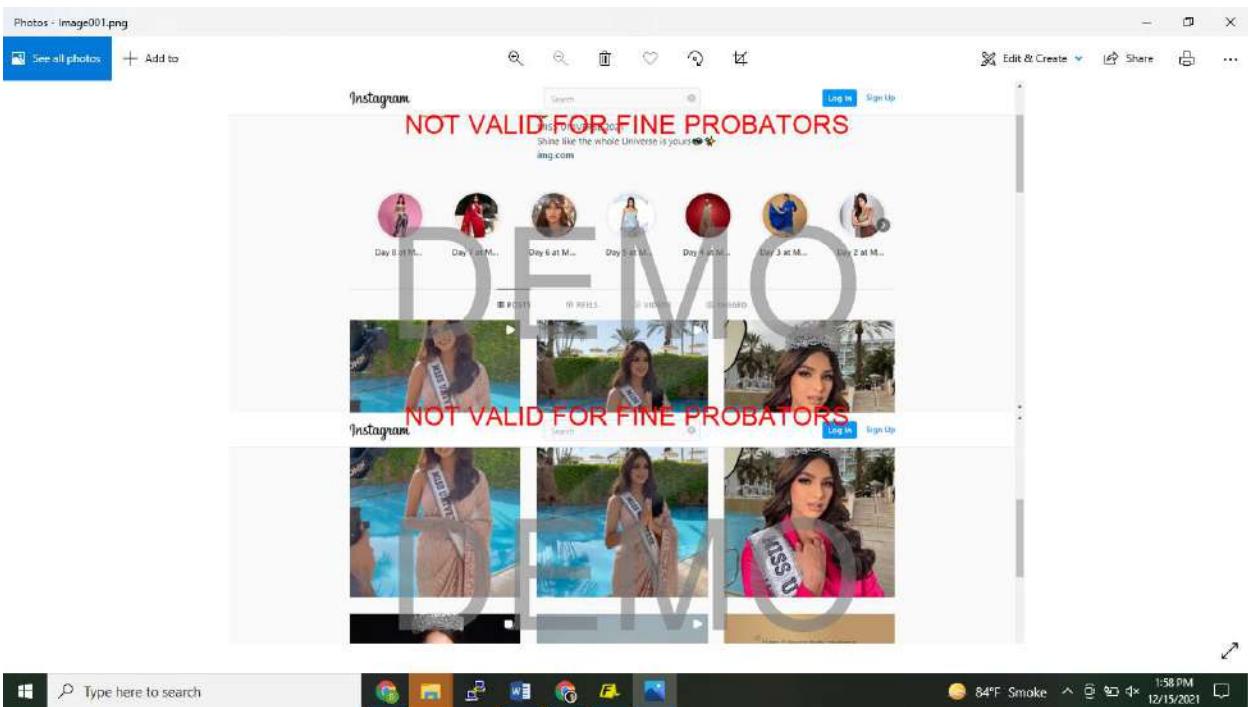
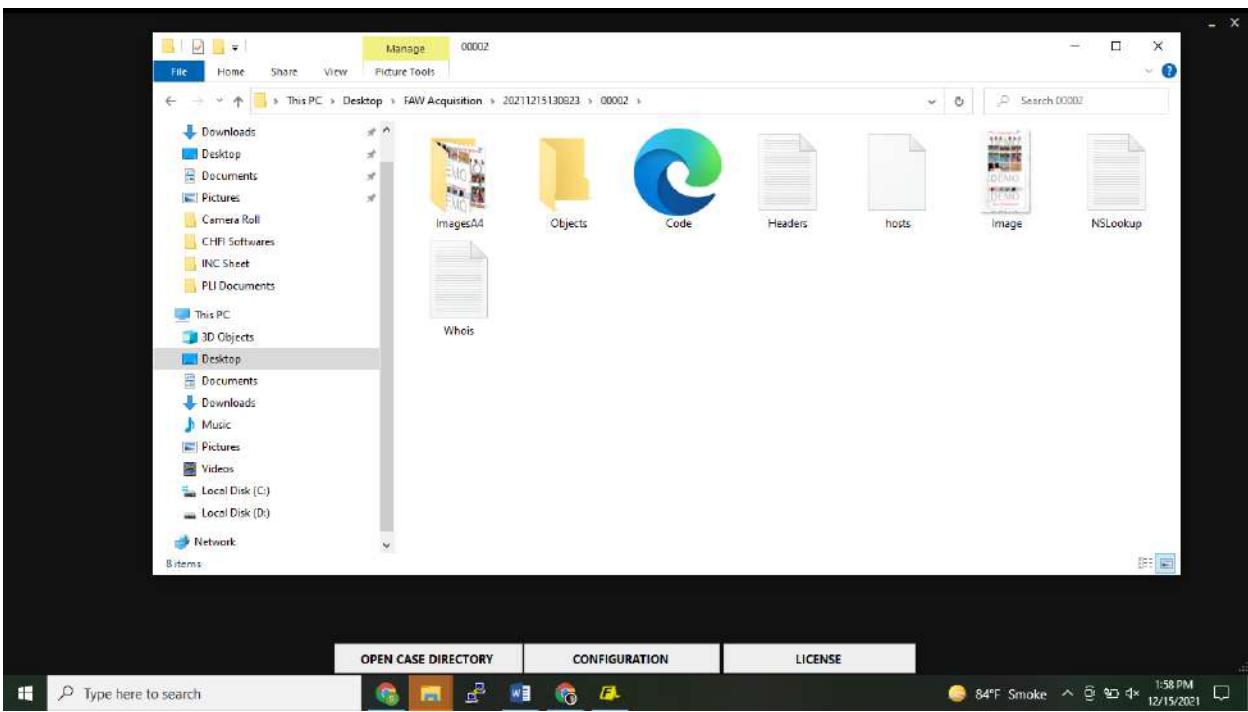
https://instagram.com/harnaazsandhu_03?utm_medium=copy_link

And click on F10 Acquisition.

To start the acquisition you can click on Camera icon.

Acquired things you will get to see in the specified folder.





Practical No. 13

Aim: Forensic Investigation Using Mobile Forensics Tools [MobiEdit]

What is Forensic Investigation?

Forensics are the scientific methods used to solve a crime. Forensic investigation is the gathering and analysis of all crime-related physical evidence in order to come to a conclusion about a suspect. Investigators will look at blood, fluid, or fingerprints, residue, hard drives, computers, or other technology to establish how a crime took place. This is a general definition, though, since there are a number of different types of forensics.

What is Mobile Forensics Tools [MobiEdit]:

Complete data extraction from phones and SIM

With MOBILedit Forensic you can view, search for or retrieve all data from a phone with only a few clicks. This data includes call history, phonebook, text messages, multimedia messages, files, calendars, notes, reminders and raw application data. It will also retrieve all phone information such as IMEI, operating systems, firmware including SIM details (IMSI), ICCID and location area information. MOBILedit Forensic is also able to bypass the passcode, PIN and phone backup encryption.

Support for almost all phones

MOBILedit Forensic supports thousands of different phones including common feature phones from manufacturers like Samsung, HTC, Nokia, Sony, LG and Motorola. It also supports all smartphone operating systems including Android, iPhone, Blackberry, Symbian, Windows Mobile, Windows Phone, Bada, Meego, Chinese phones and CDMA phones.

MOBILedit used for:

- 1) Data Acquisition
- 2) Retrieval of Data
- 3) Recovering of Data

What is Data Acquisition?

It is a process where we acquire all the data from the cell phones which can be messages, videos, images, contacts, call logs and all other info.

MOBILedit is a tool used to acquire and recover data in mobile phones.

It is specially designed for mobile phone forensics.

Steps:

- 1) How to enable developer option in any Android phone and Turn the USB debugging on.**

Go to Settings - About Phone – Software Information – Then tap 7 times on, Build Number.

Then go to Settings – System – Developer Options – USB debugging – Turn the USB debugging on.

Tue 6:00 AM

Jio 4G

8:12

Mon, Dec 13



Tp_link_



Mobile data



Bluetooth



Location



Hotspot



Auto-rotate



Flashlight



Vibration mode



Silent



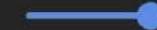
Bedtime mode



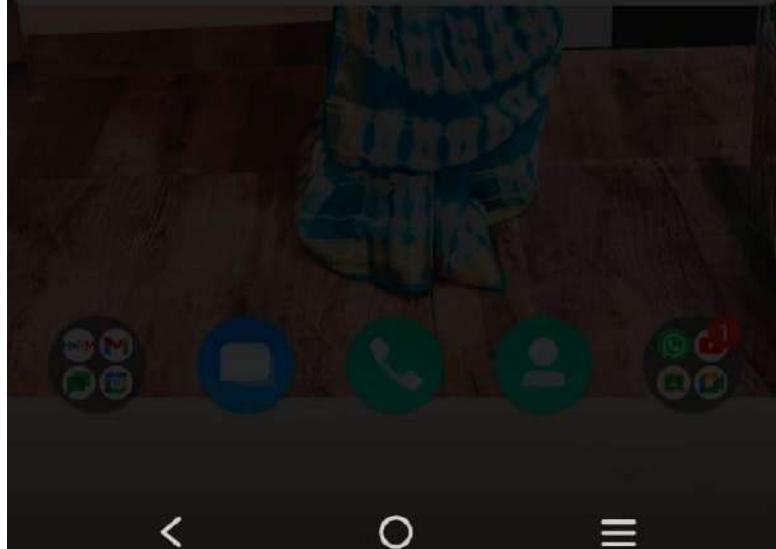
S-capture



Invert colors



A



8:12



Settings



Network & internet



Wi-Fi, SIM card & mobile network, hotspot & tethering



Bluetooth and device connection

Smart Mirroring, Android Auto



Display & brightness

Eye Protection, Dark mode, status bar



Lock screen & wallpaper

Themes



Dynamic effects

Personalized animation effects



Sound

Volume, Do Not Disturb mode



8:12



Settings



Jovi Home

Shortcuts, suggestions, my services



Ultra Game Mode

Game Assistant, Game Do Not Disturb,
Esports Mode



Shortcuts & accessibility

S-capture, Smart Motion, Accessibility

Digital Wellbeing & parental controls

Screen time, app timers, bedtime
schedules

Google

Services & preferences



Accounts

iQOO account, other accounts



System

System navigation, Language and input
method, Backup



About phone

iQOO Z3 5G



8:13



< About phone



Device name:iQOO Z3 5G



Processor

2.8 GHz
Snapdragon 768G
Octa-core



RAM

8.00+4.00 GB ⓘ



Android version
11



Phone storage
128 GB

Software information

Model, software version, etc.

Status

SIM card status, IMEI, etc.

Legal information

Privacy Policy, authentication information, etc.

Customer service

Manual, E-warranty card, etc.



8:13



< Software information



OS version

Funtouch OS 11.1 Global

Model

I2011

Serial number

[REDACTED]

Hardware version

[REDACTED]

Build number

[REDACTED]

Baseband version

[REDACTED]

Kernel version

[REDACTED]

Compile time

[REDACTED]

You are now 2 steps away from being a
developer.

Android security update

November 1, 2021



8:13



< Software information



OS version

Funtouch OS 11.1 Global

Model

I2011

Serial number

[REDACTED]

Hardware version

[REDACTED]

Build number

[REDACTED]

Baseband version

[REDACTED]

Kernel version

[REDACTED]

Compile time

[REDACTED]

You are now a developer!

Android security update

November 1, 2021



8:14



< System



Global search

Multi-Turbo

Languages & input

Gboard

Date & time

GMT+05:30

Backup data

Restore data

Reset options

Network, apps, or device can be reset

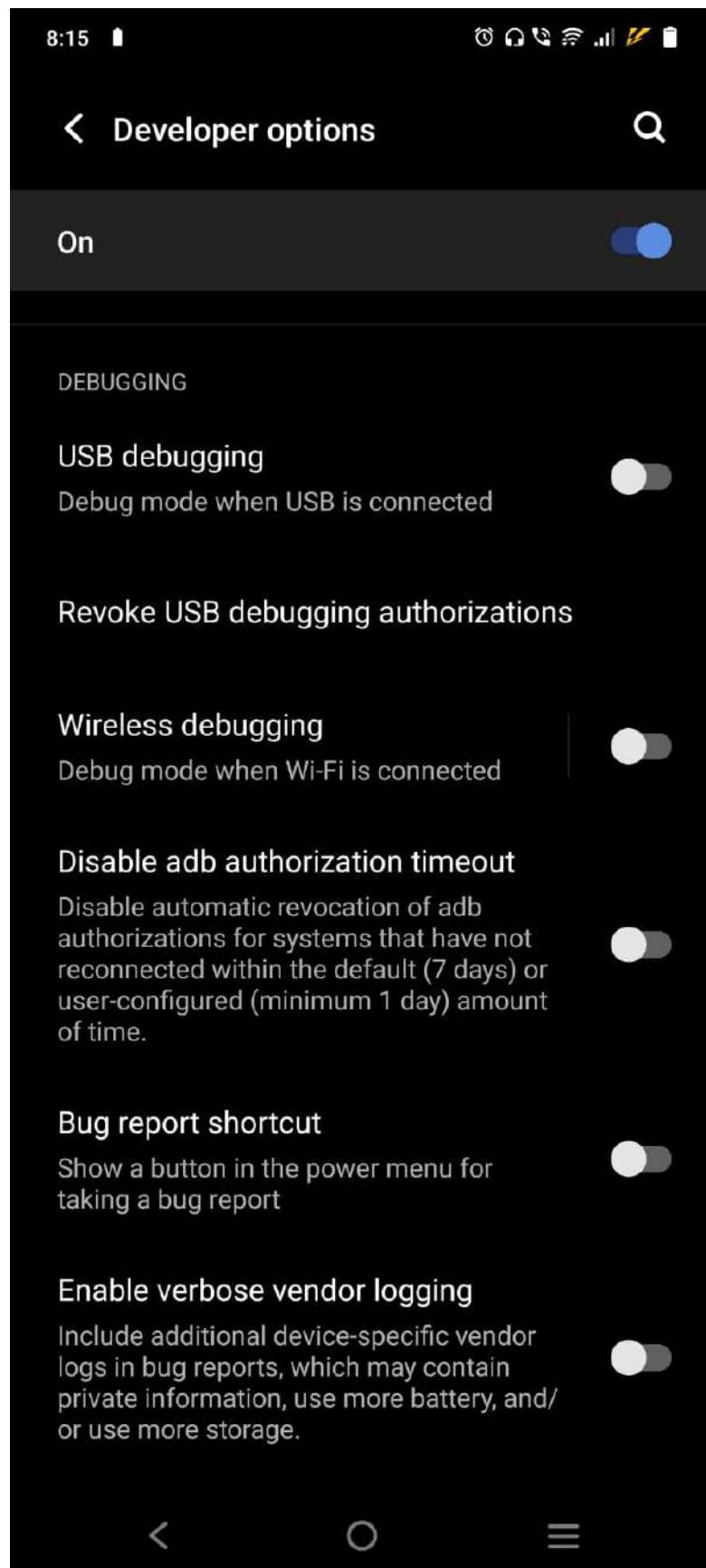
Multiple users

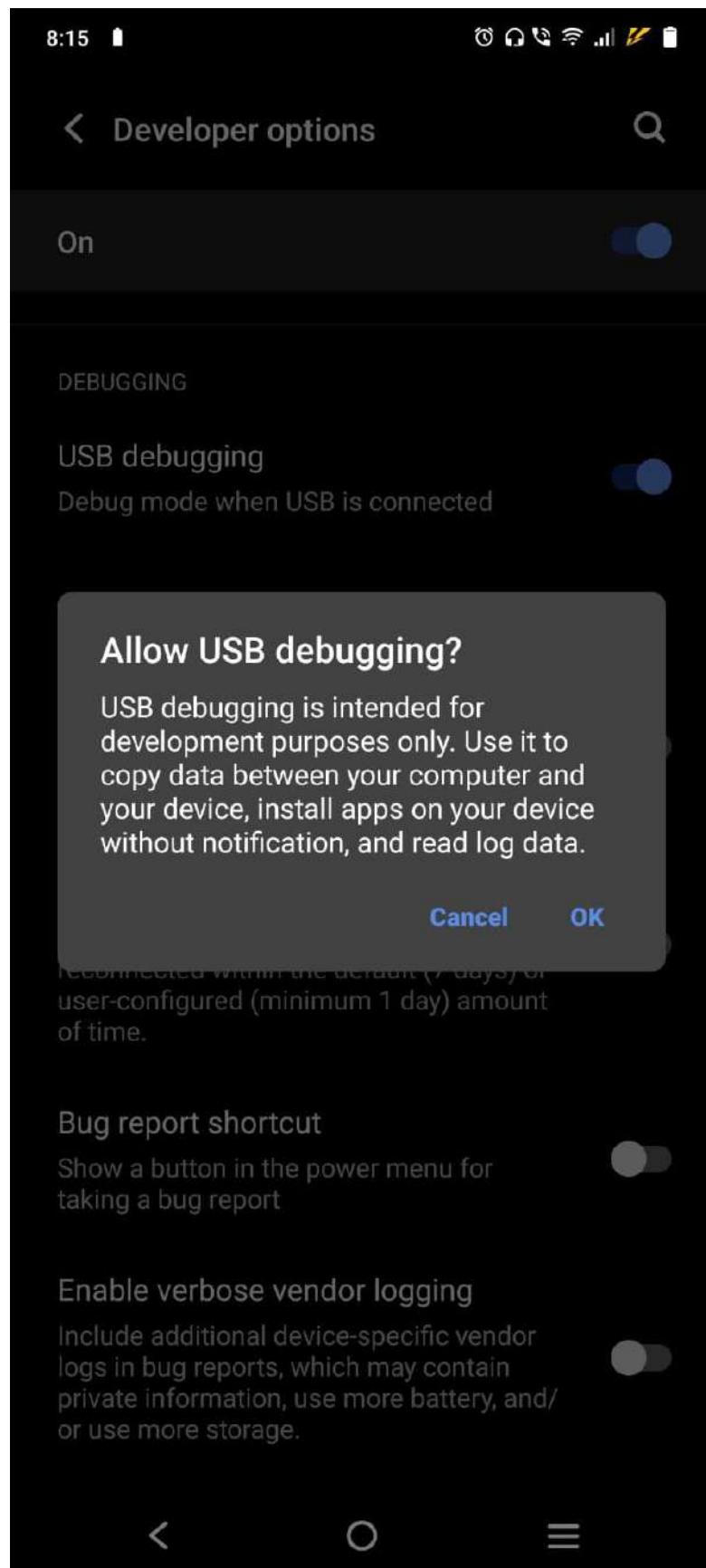
Signed in as Scarlet

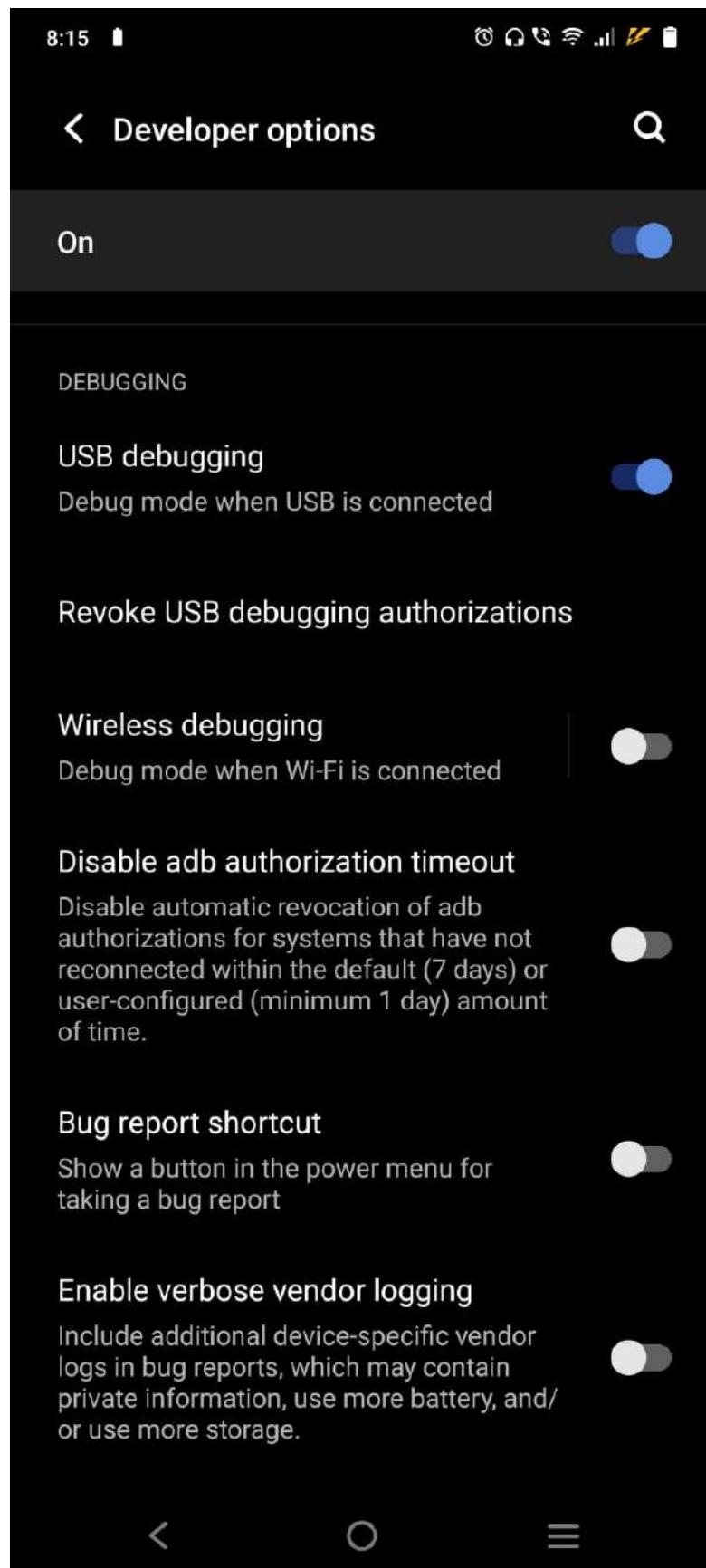
Phone clone

Developer options









2) Connect your phone with USB Cable with your computer or laptop. After that one popup will appear on your phone, Select File transfer from USB Preferences.

8:35

① ② ③ ④ ⑤

< USB Preferences



USB

USB CONTROLLED BY

Connected device



This device



USE USB FOR

File Transfer



USB tethering



MIDI



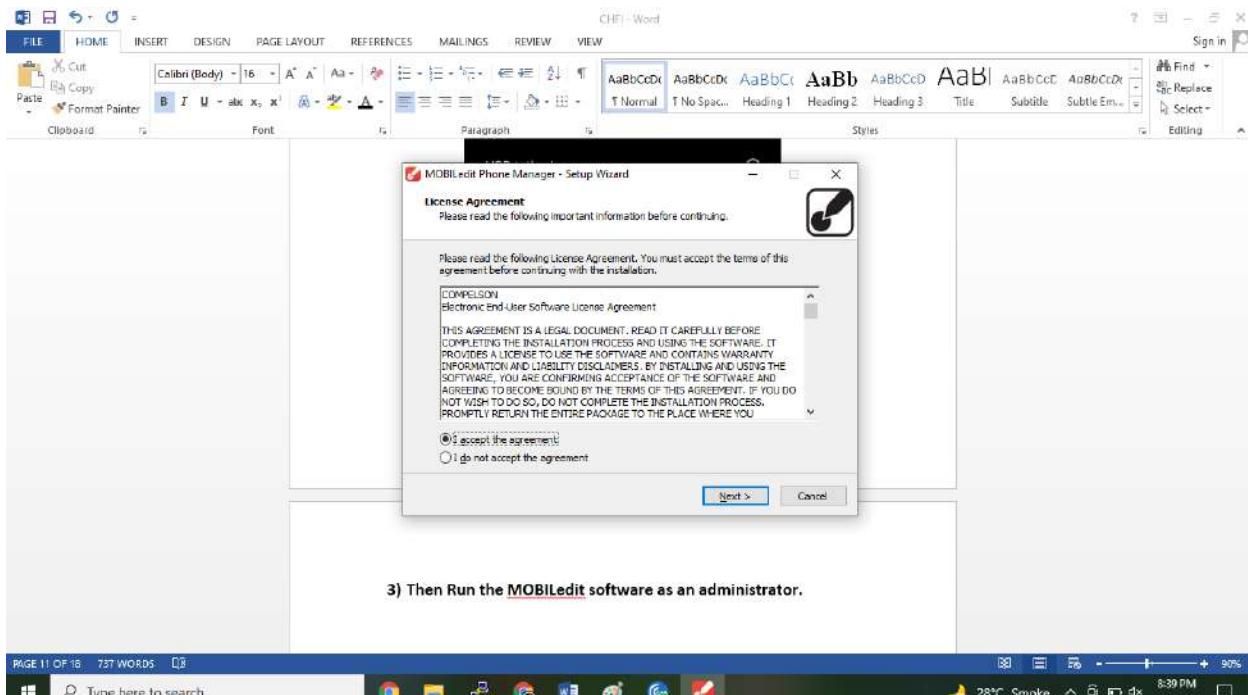
PTP



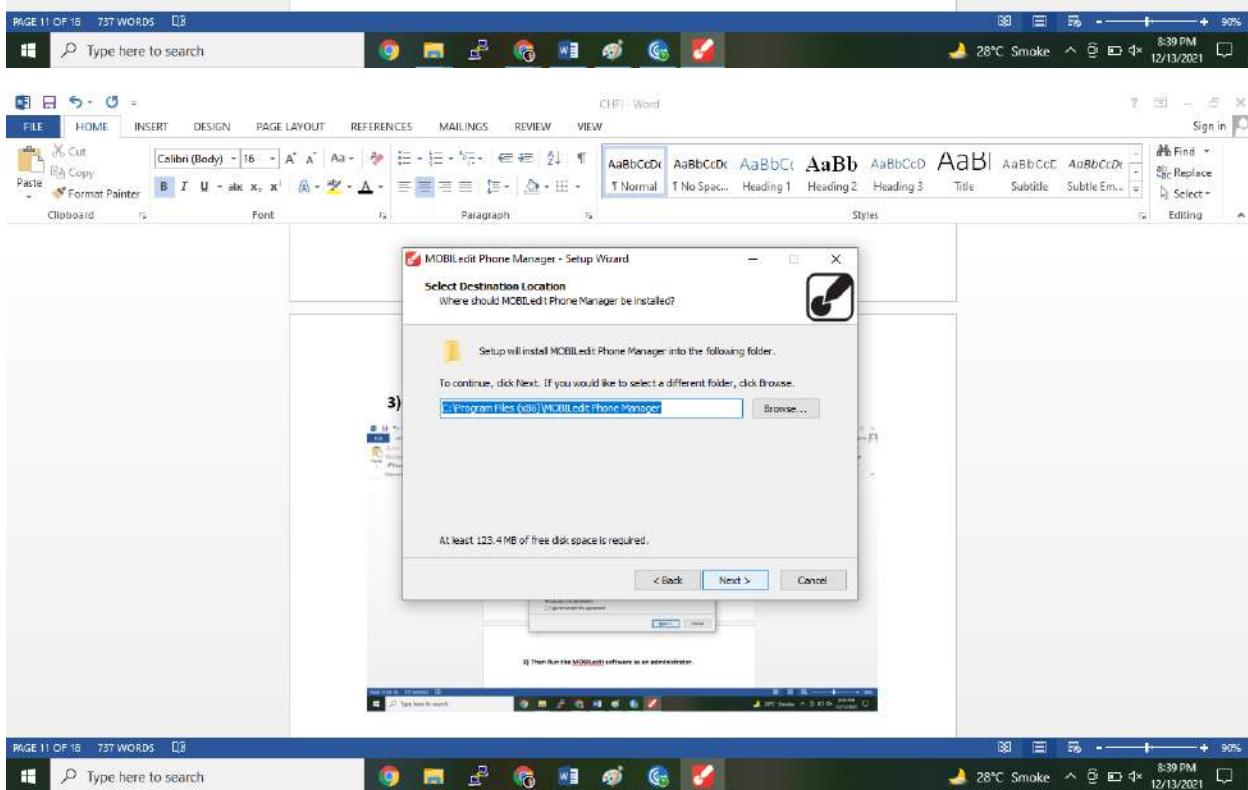
No data transfer

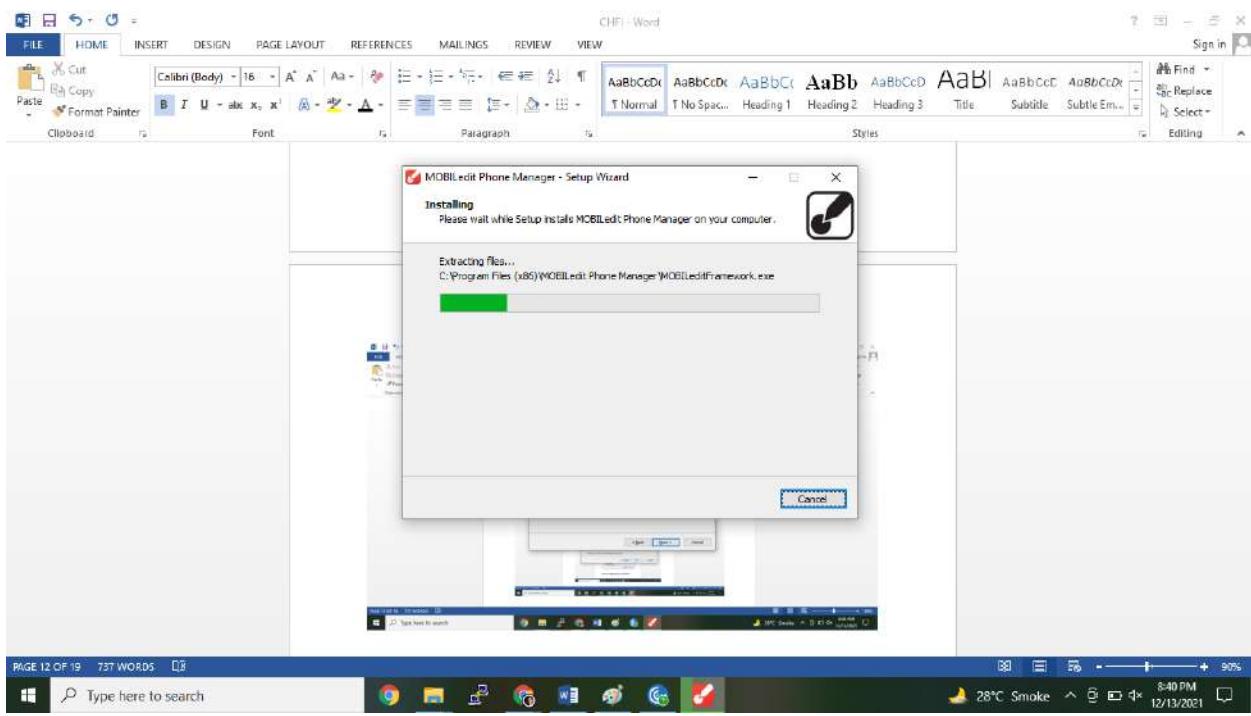
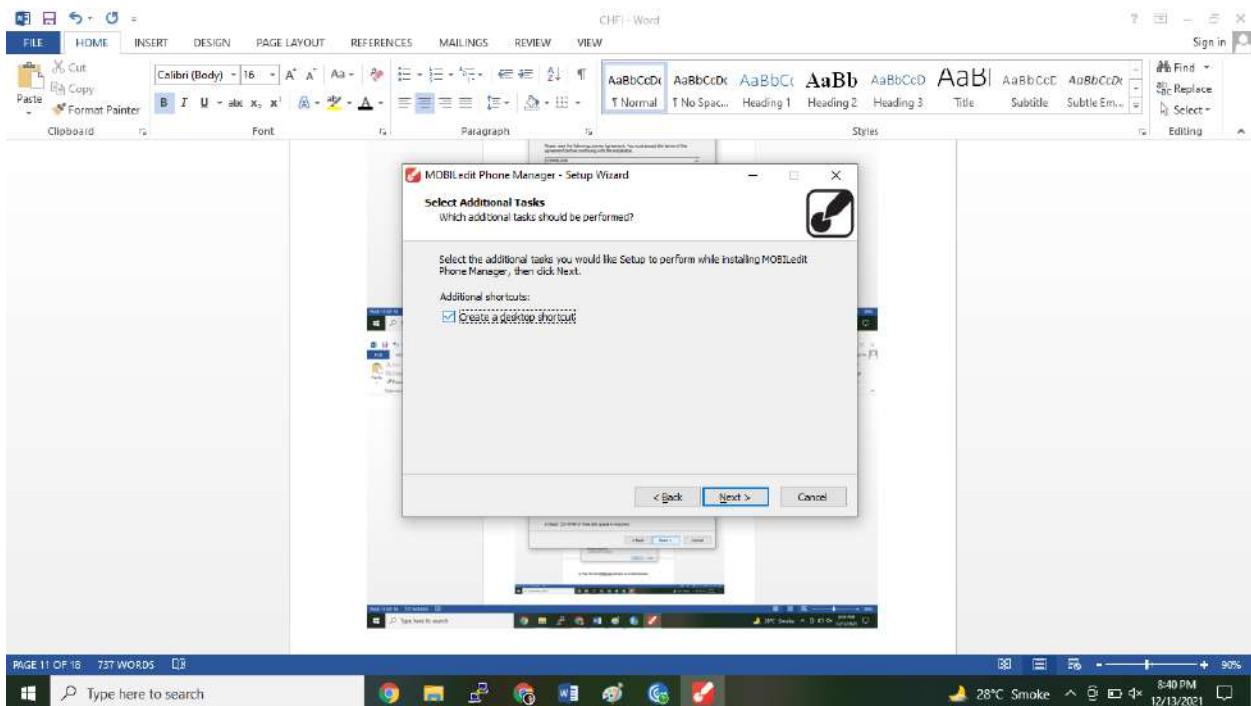


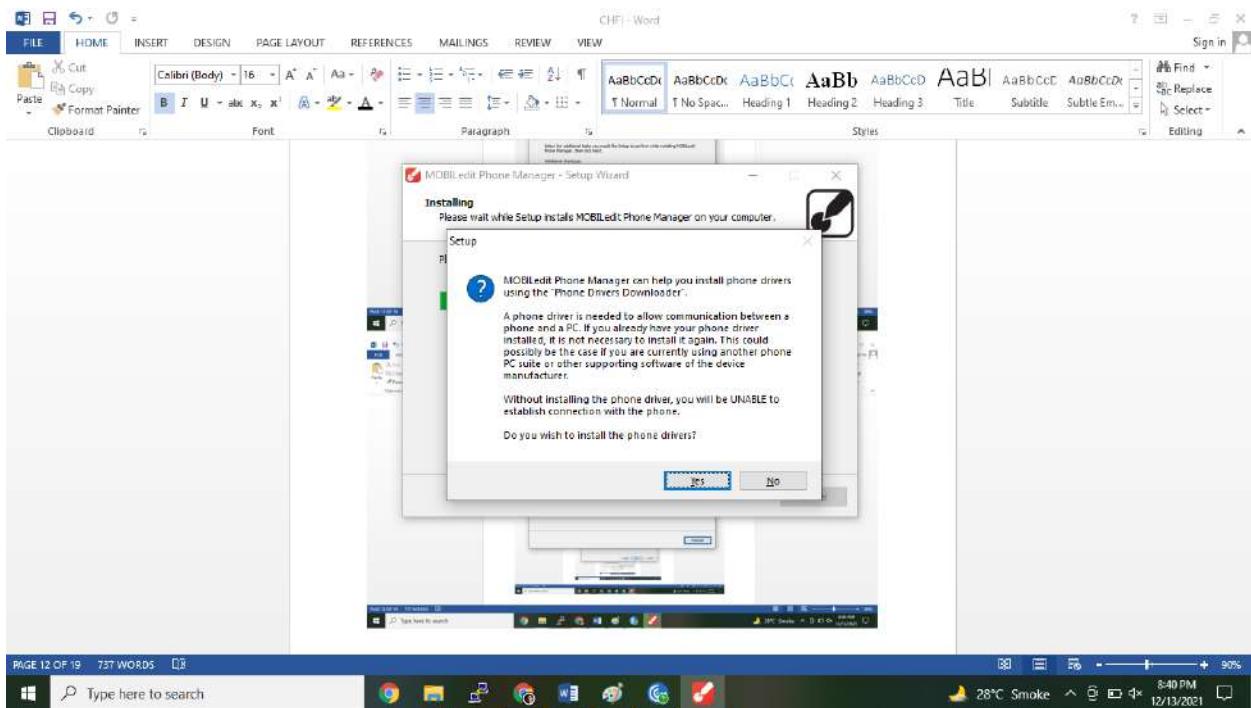
3) Then Run the MOBILedit software as an administrator.



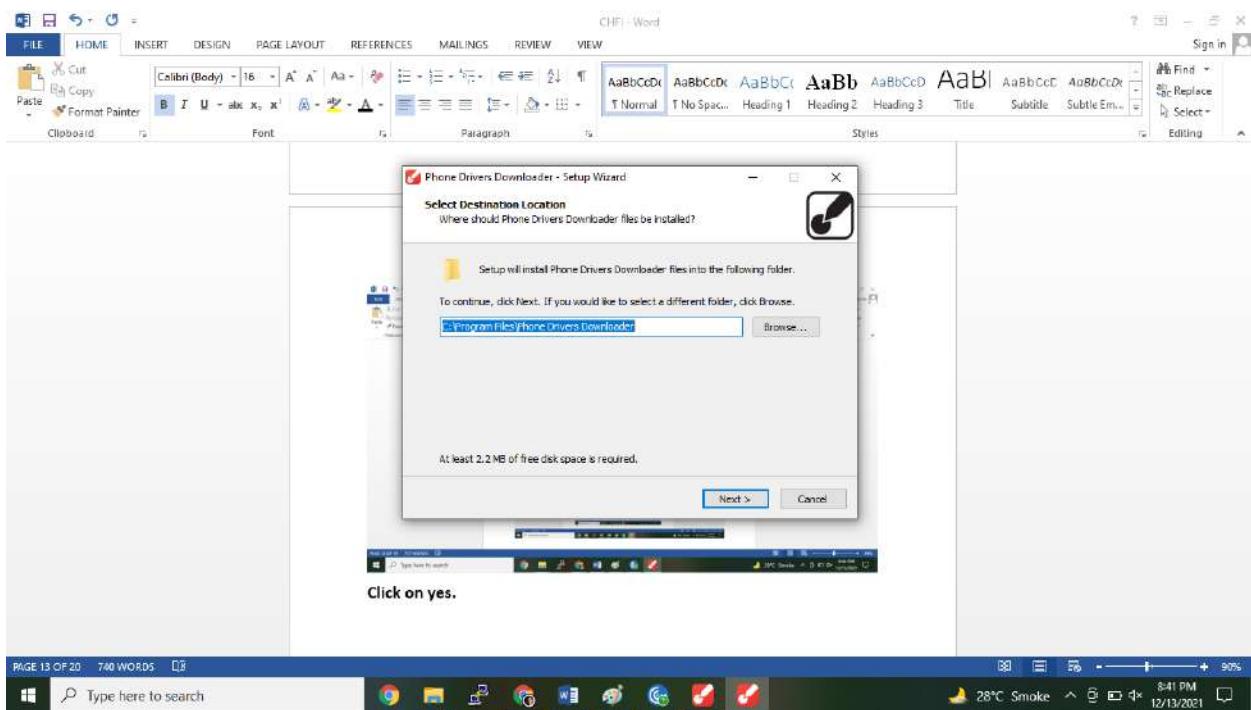
3) Then Run the MOBILedit software as an administrator.

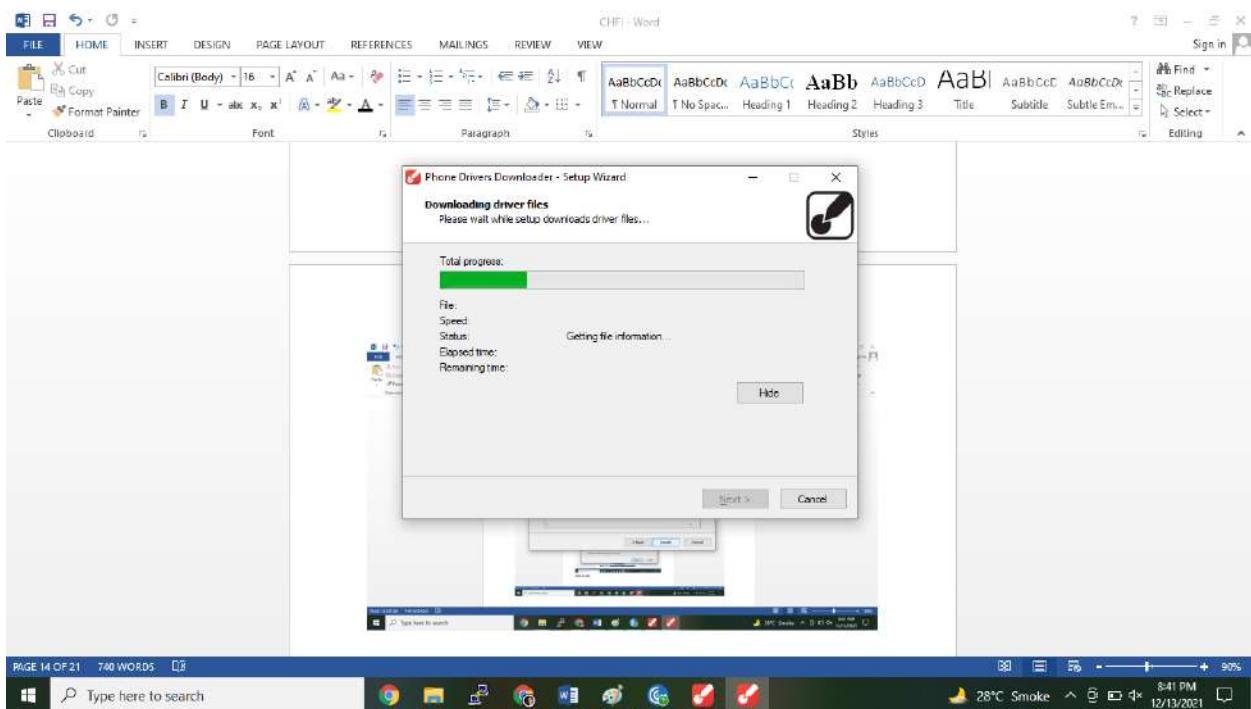
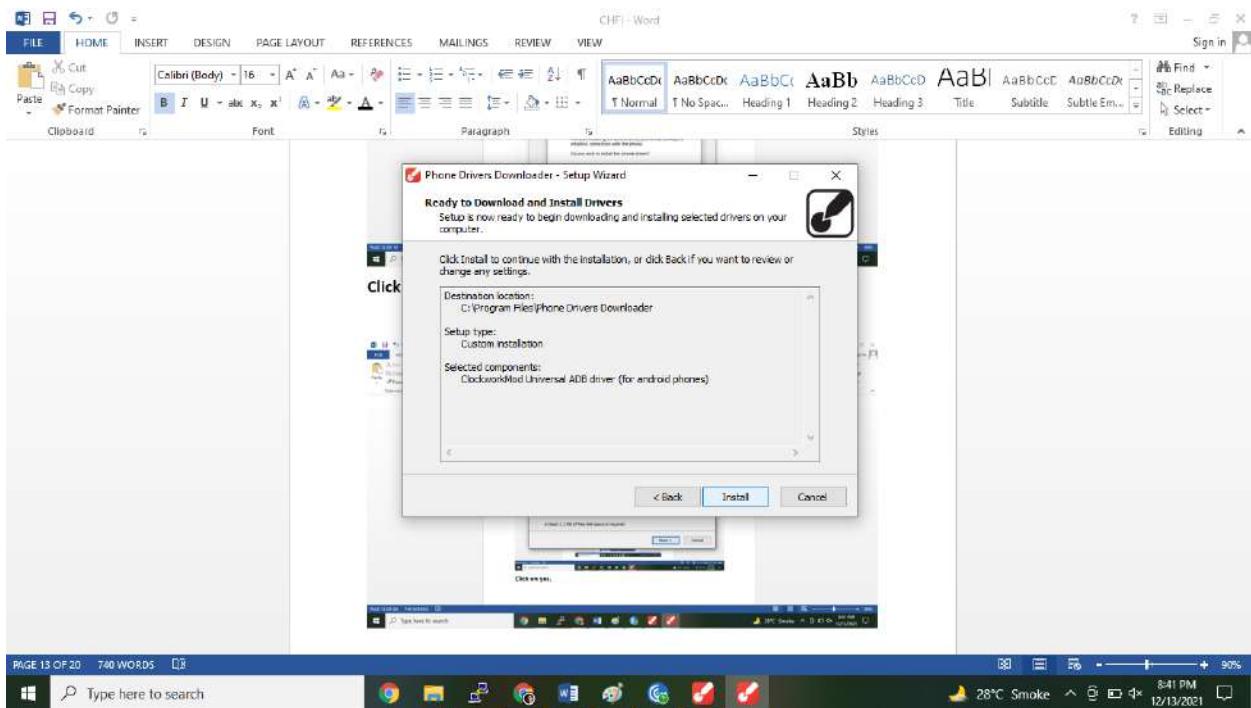


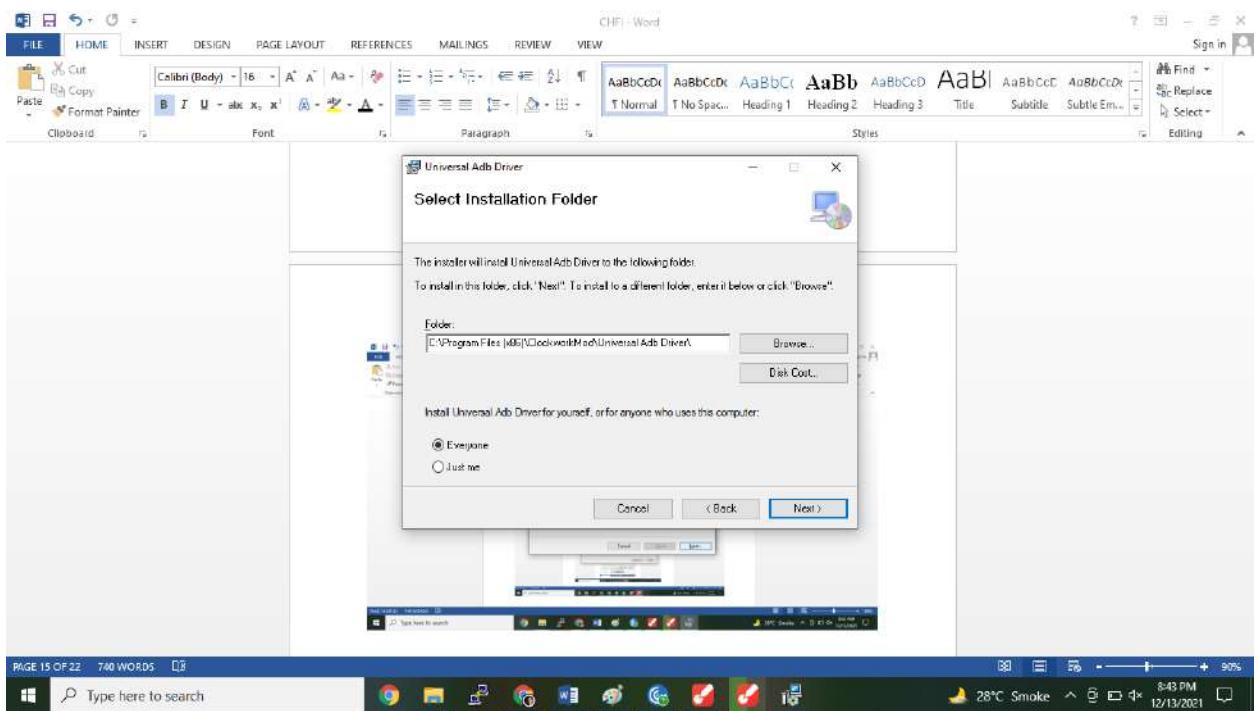
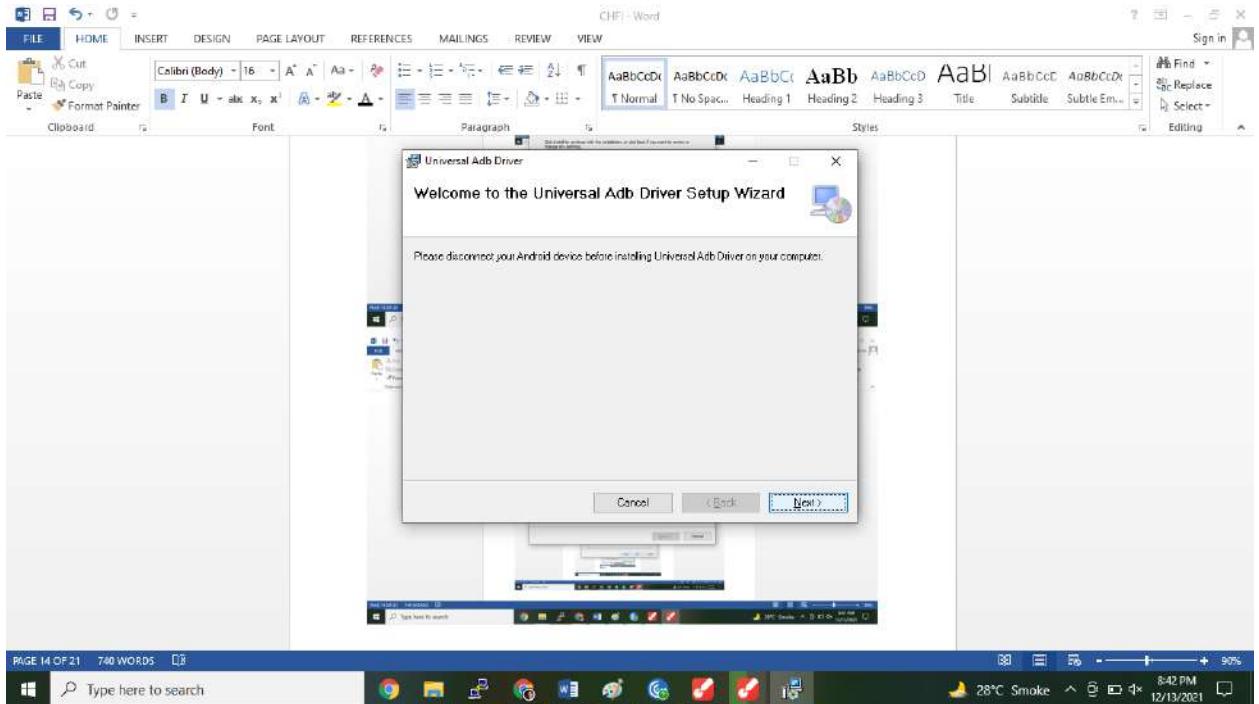


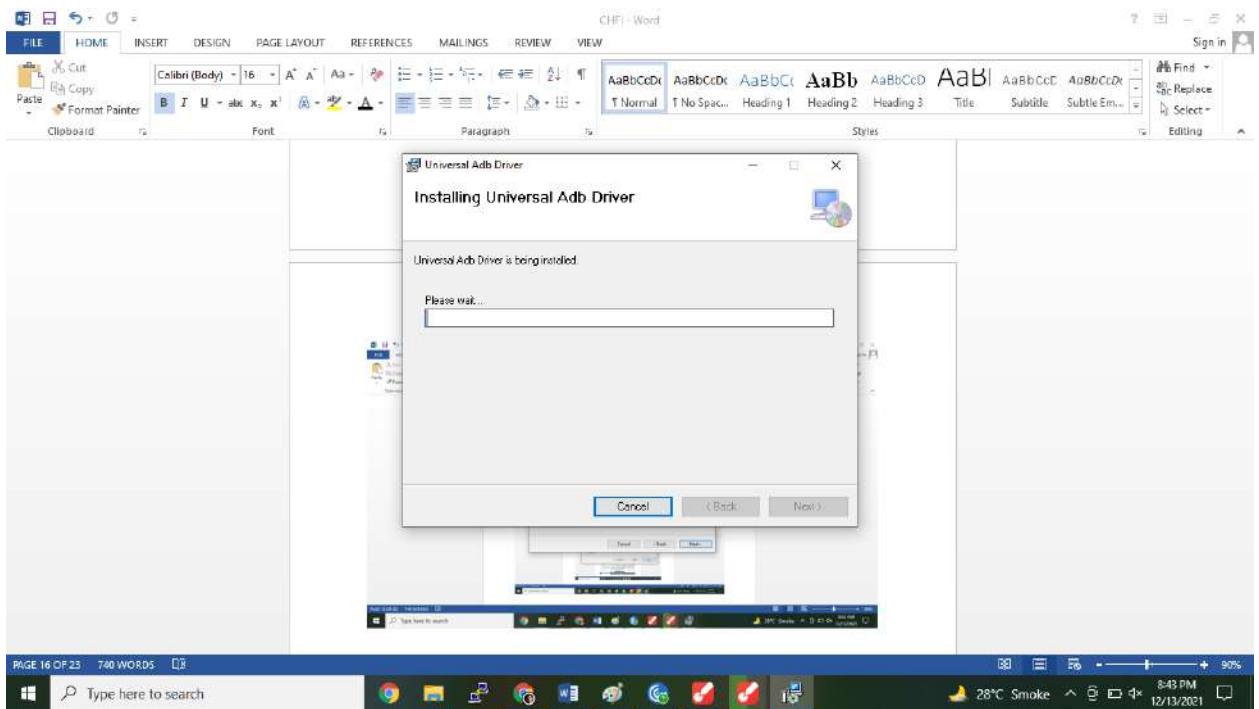
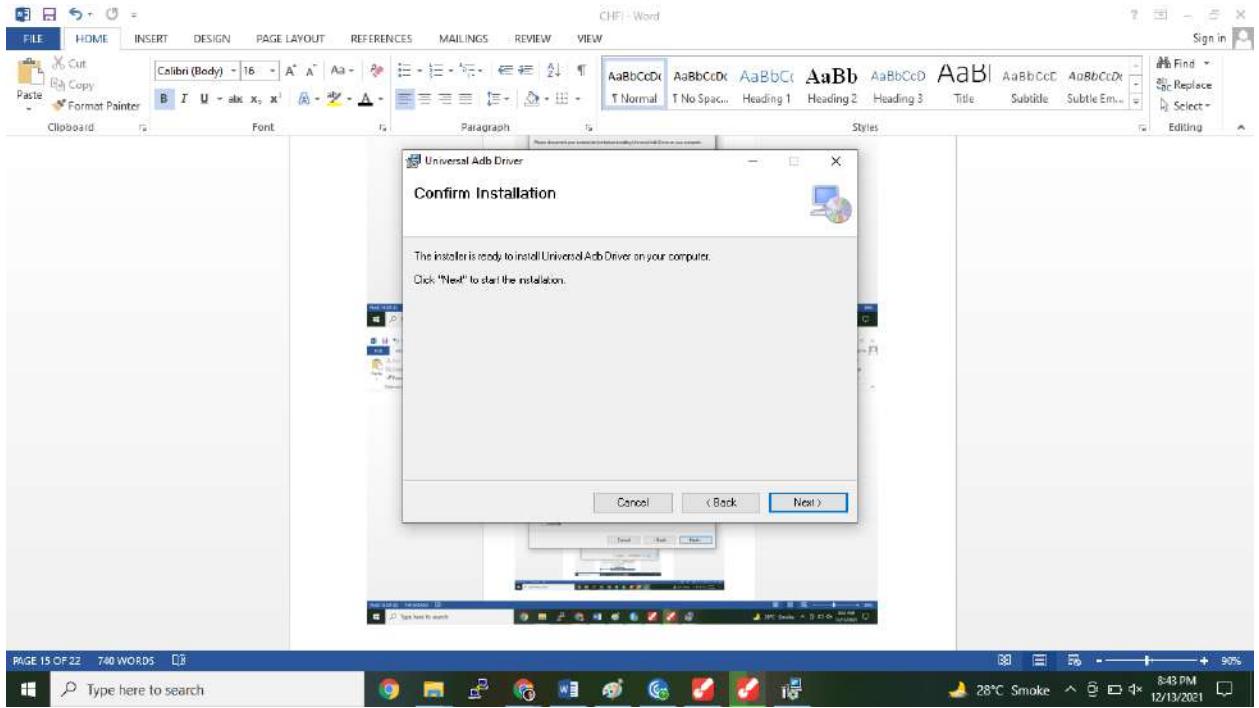


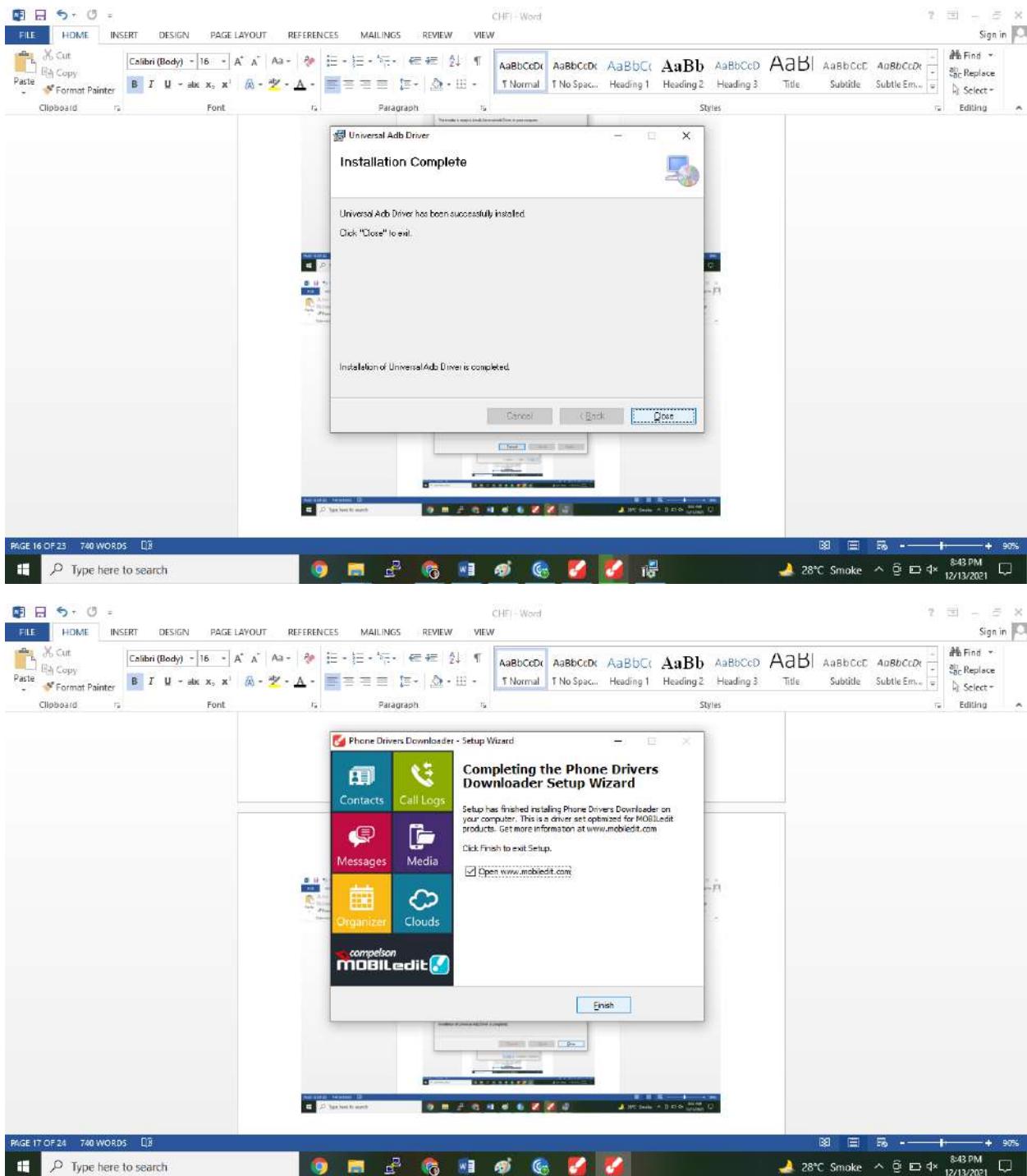
Click on yes.





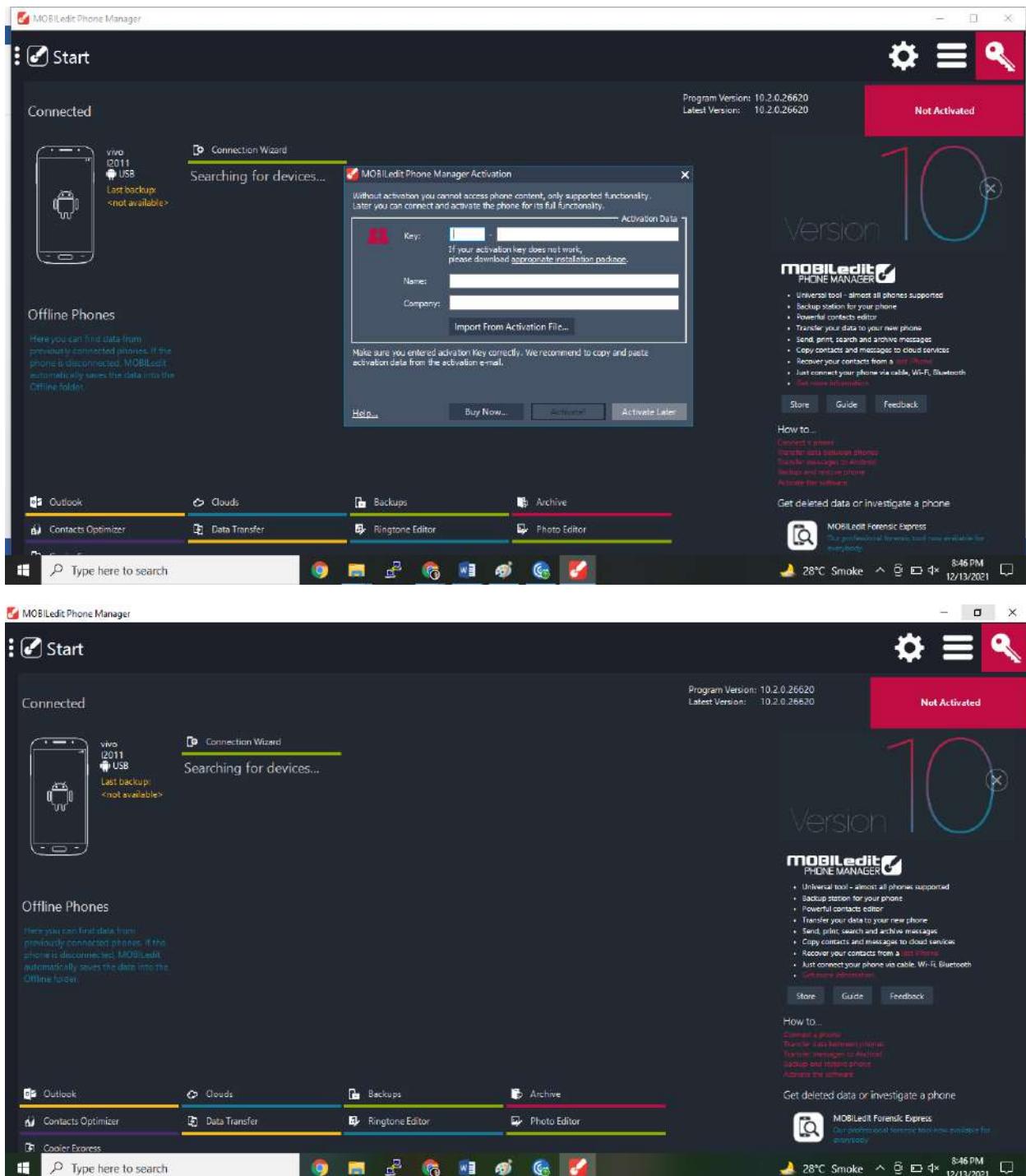






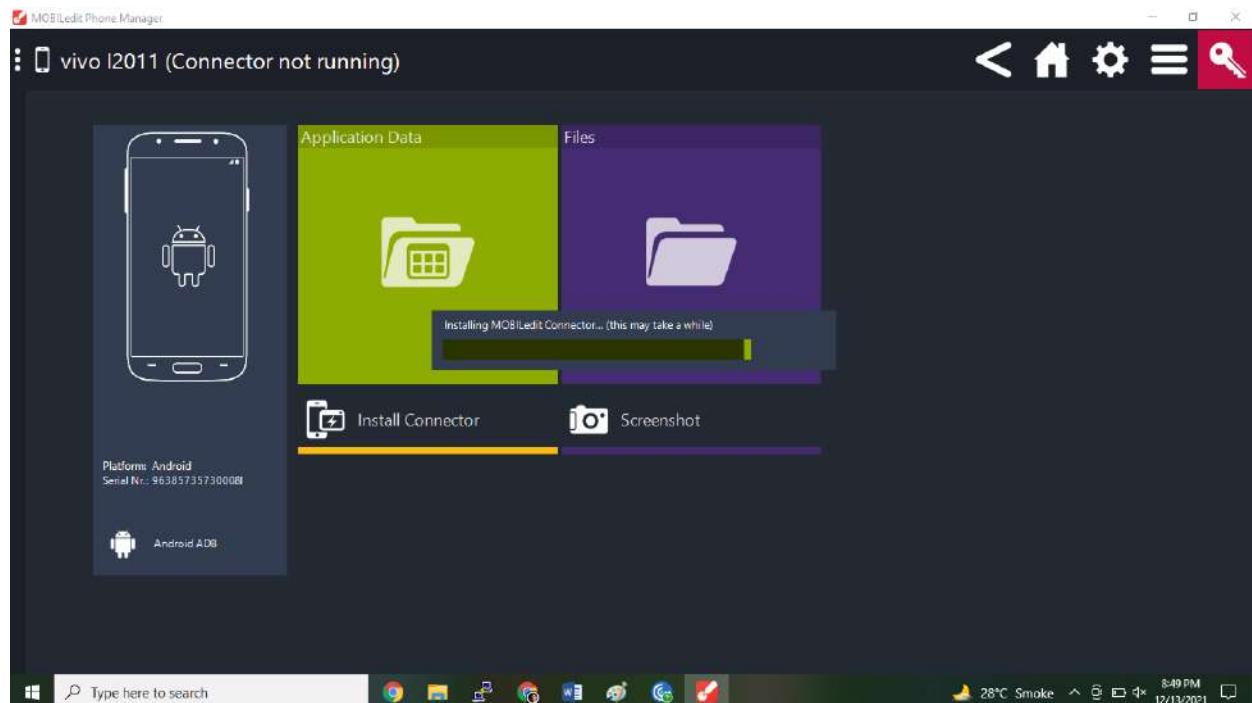
4) Allow USB debugging from this computer after connecting your mobile phone with your computer or laptop.

5) Open MOBILedit Application. MOBILedit Phone Manager Activation tab will open, click on Activate Later.

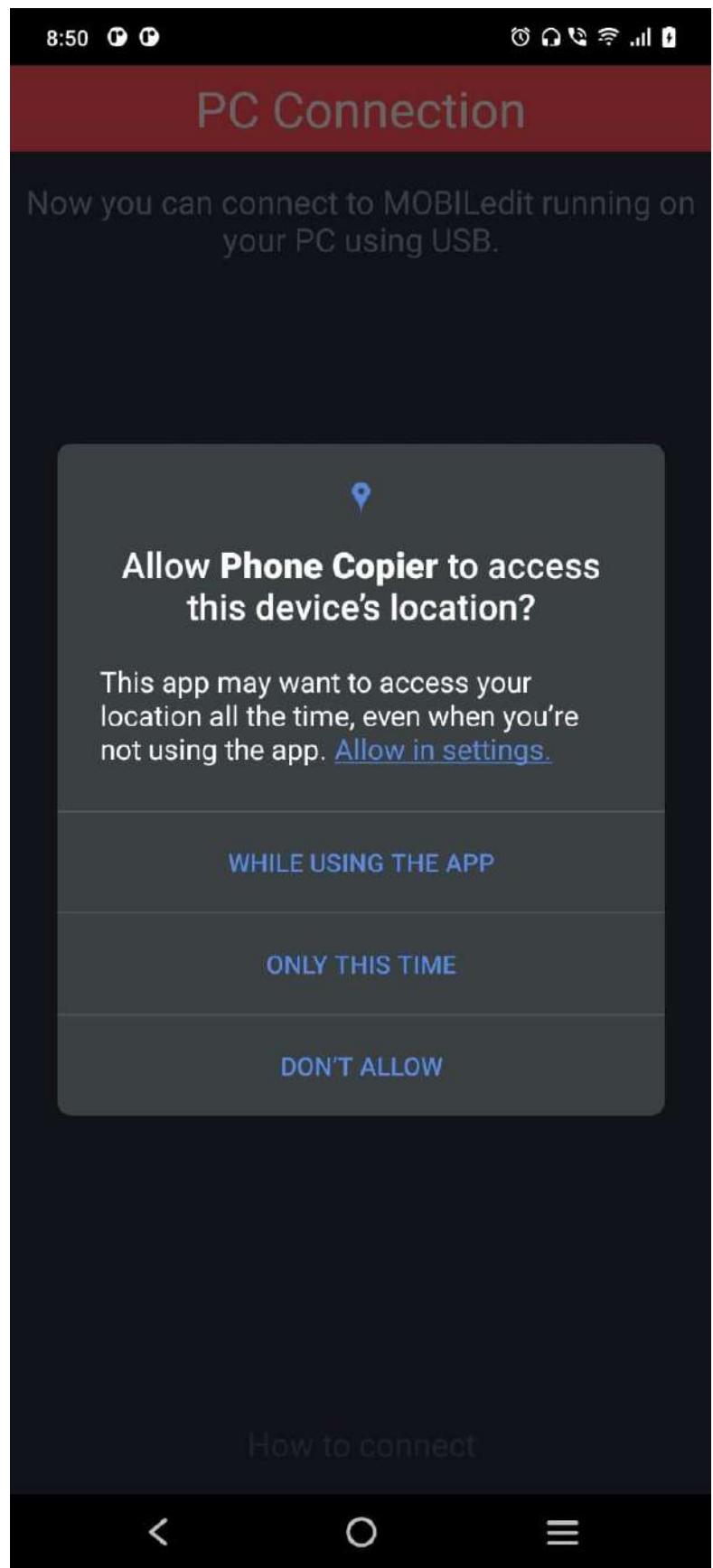


Once you click Always Allow option on your mobile phone, your phone will get connected.

Double click on Connected phone The MOBILedit connector will start to install.



Then allow for all the popups which appear on your mobile phone.



8:50



PC Connection

Now you can connect to MOBILedit running on
your PC using USB.



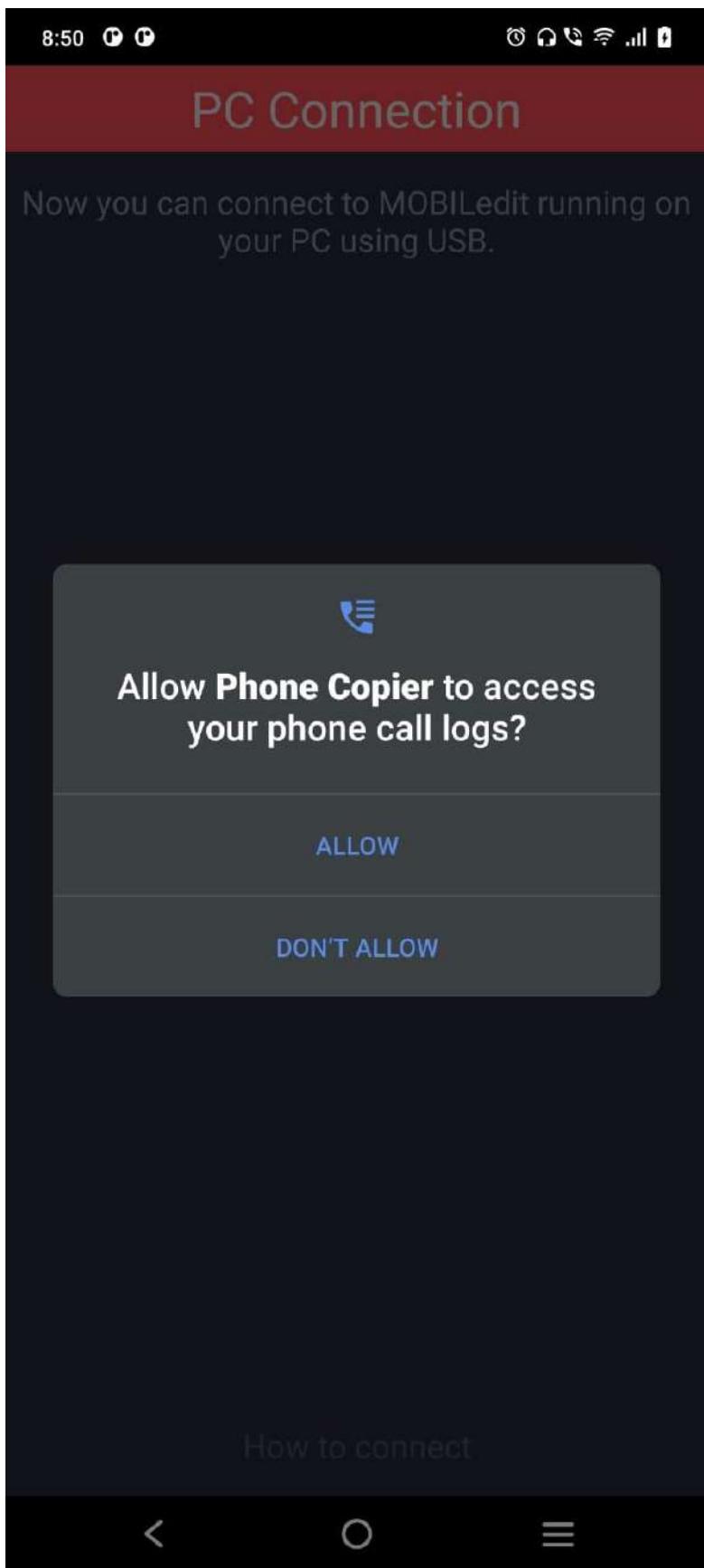
**Allow Phone Copier to access
your calendar?**

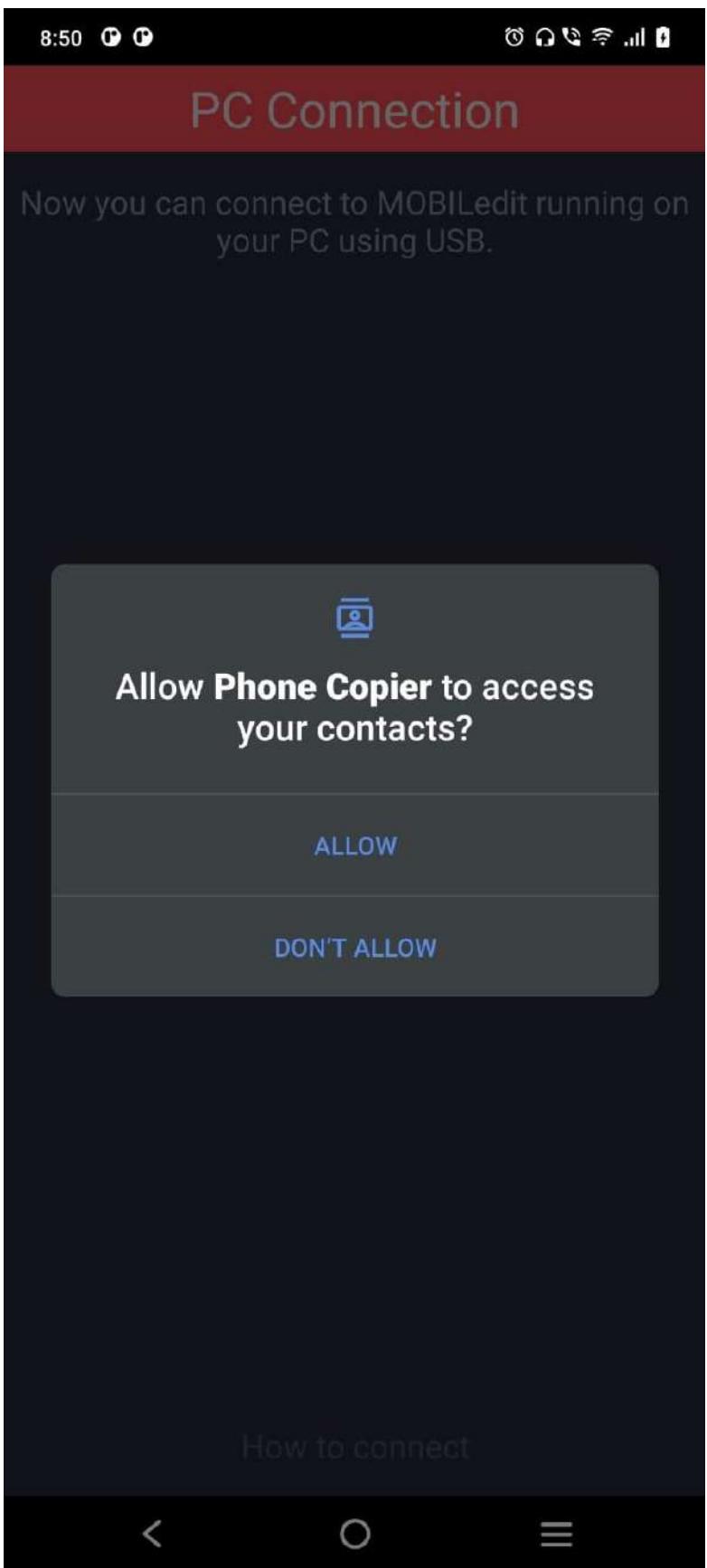
ALLOW

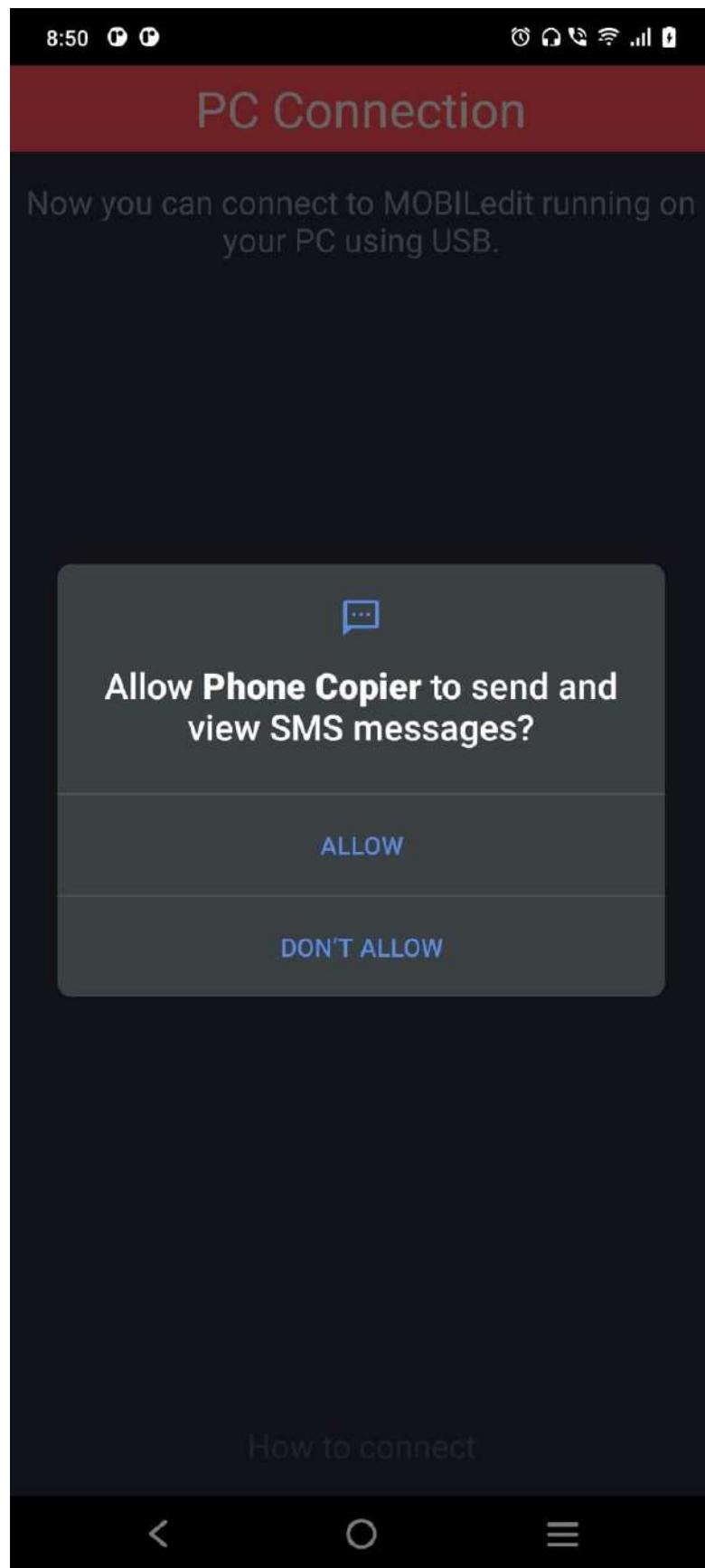
DON'T ALLOW

How to connect









8:50

⌚ ⚡ ⚡ ⚡ ⚡ ⚡ ⚡

PC Connection

Now you can connect to MOBILedit running on
your PC using USB.



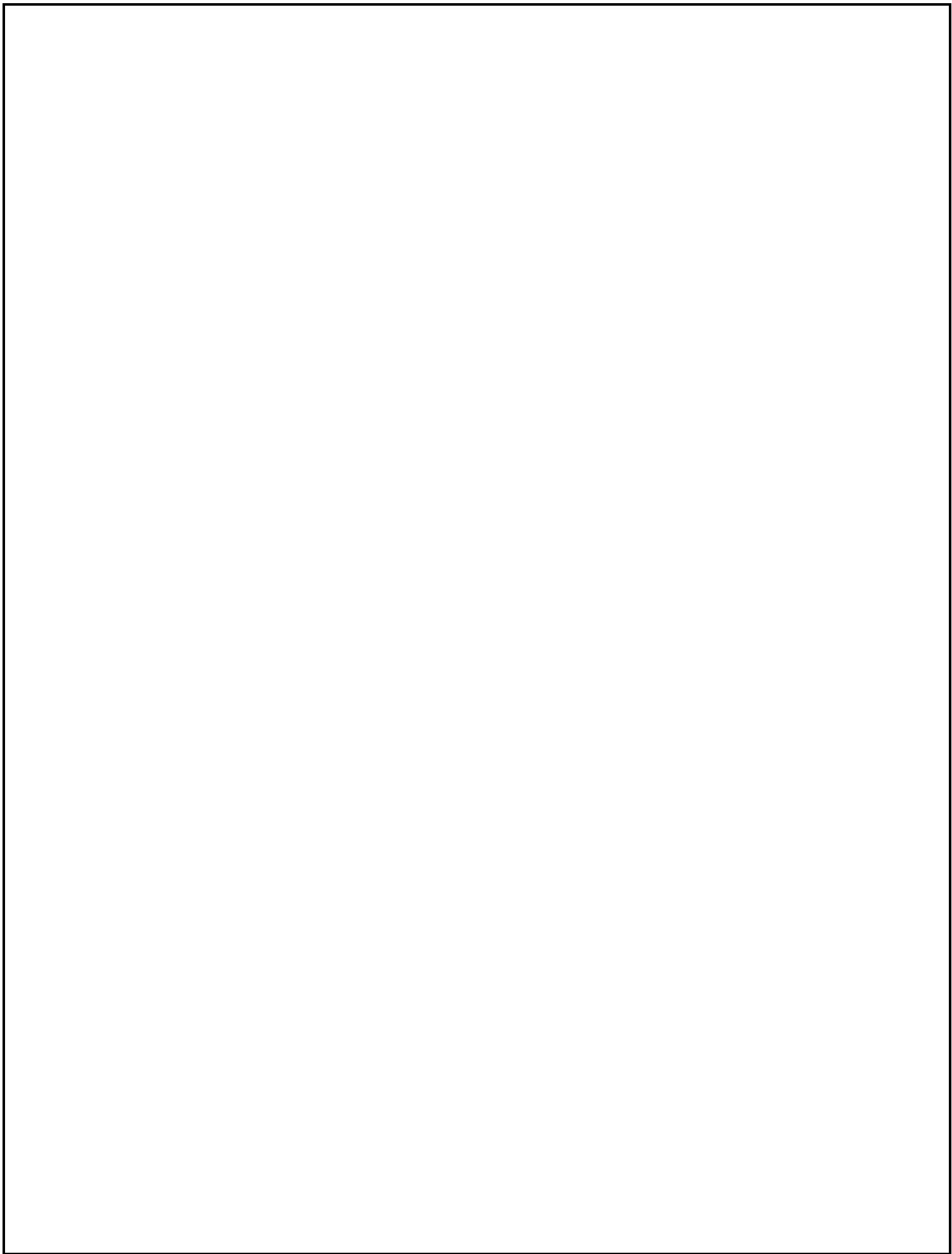
**Allow Phone Copier to access
photos, media, and files on your
device?**

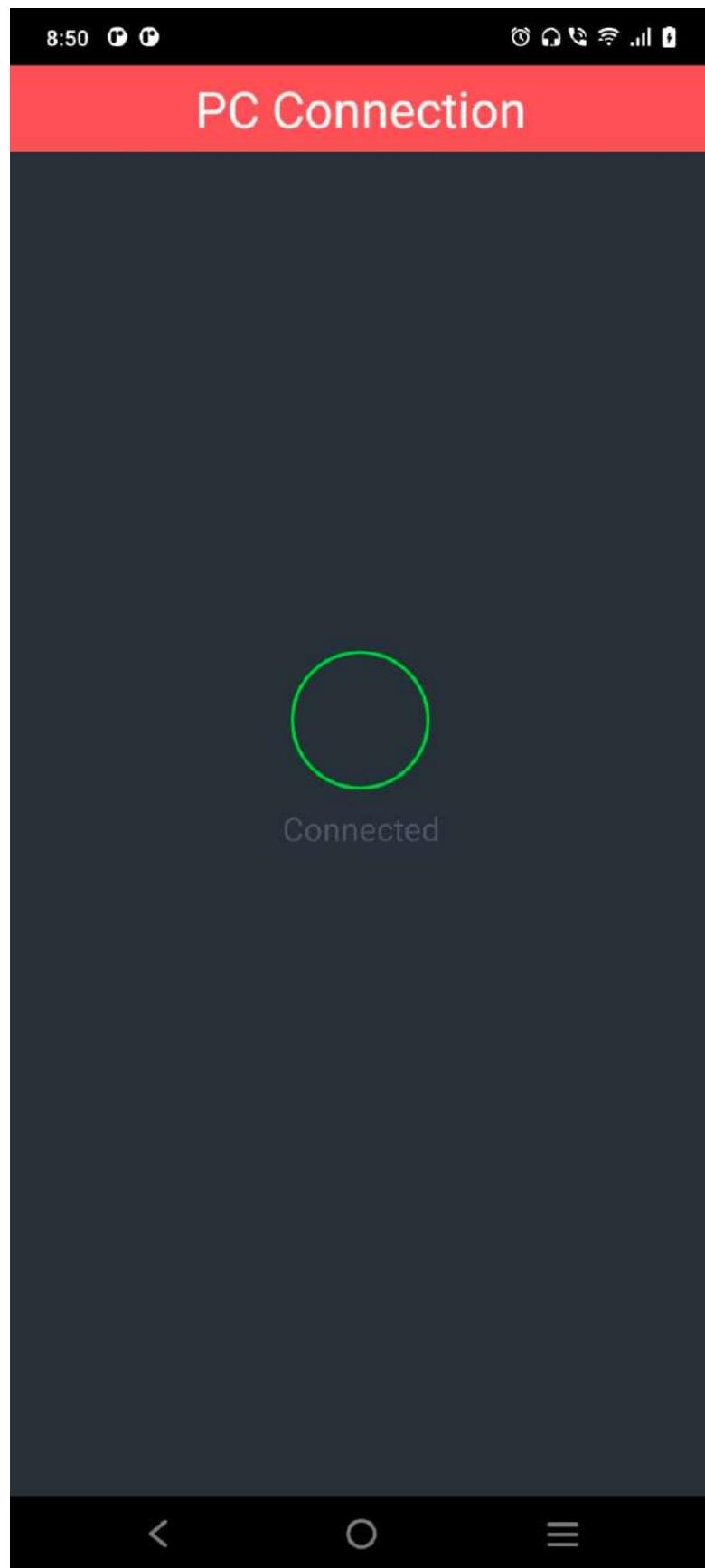
ALLOW

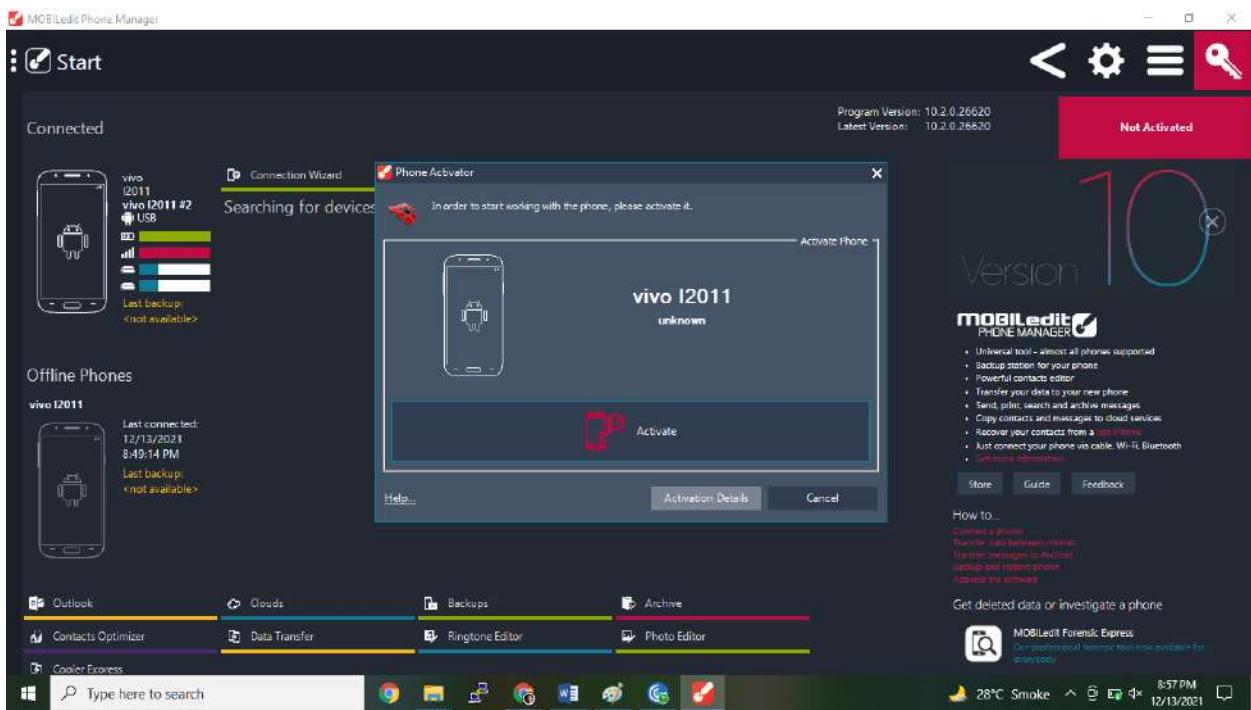
DON'T ALLOW

How to connect

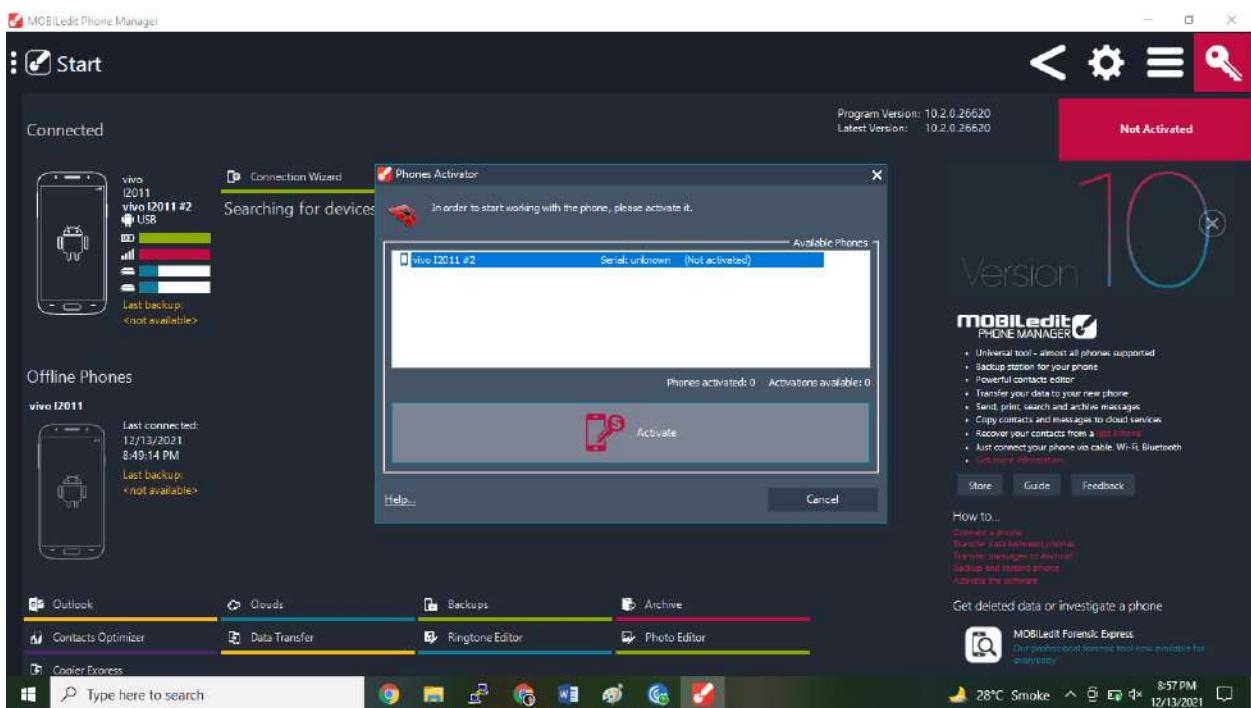




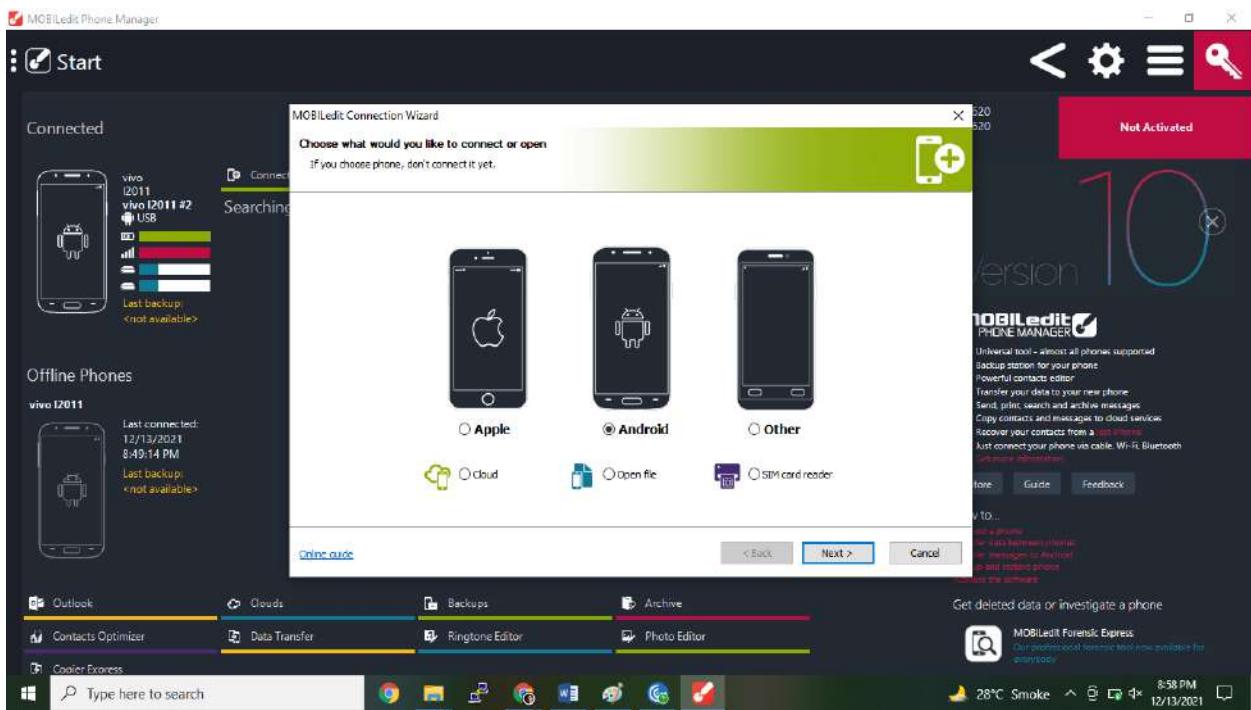




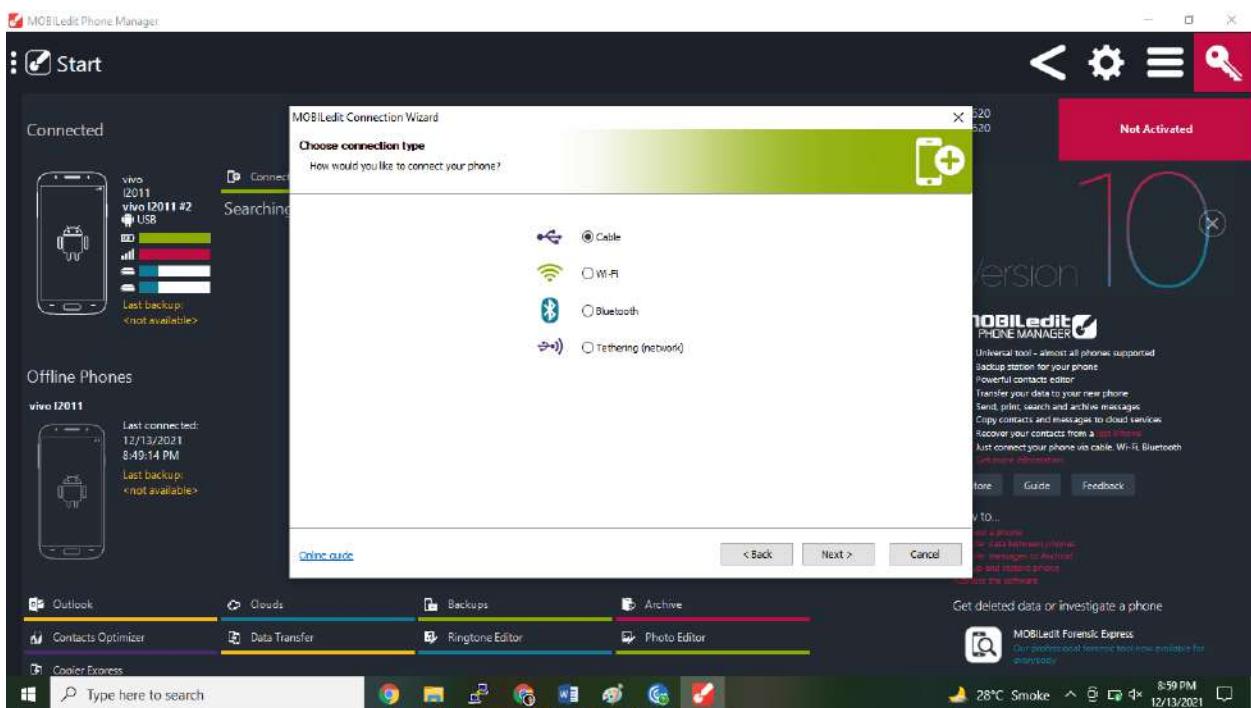
Click on Activate



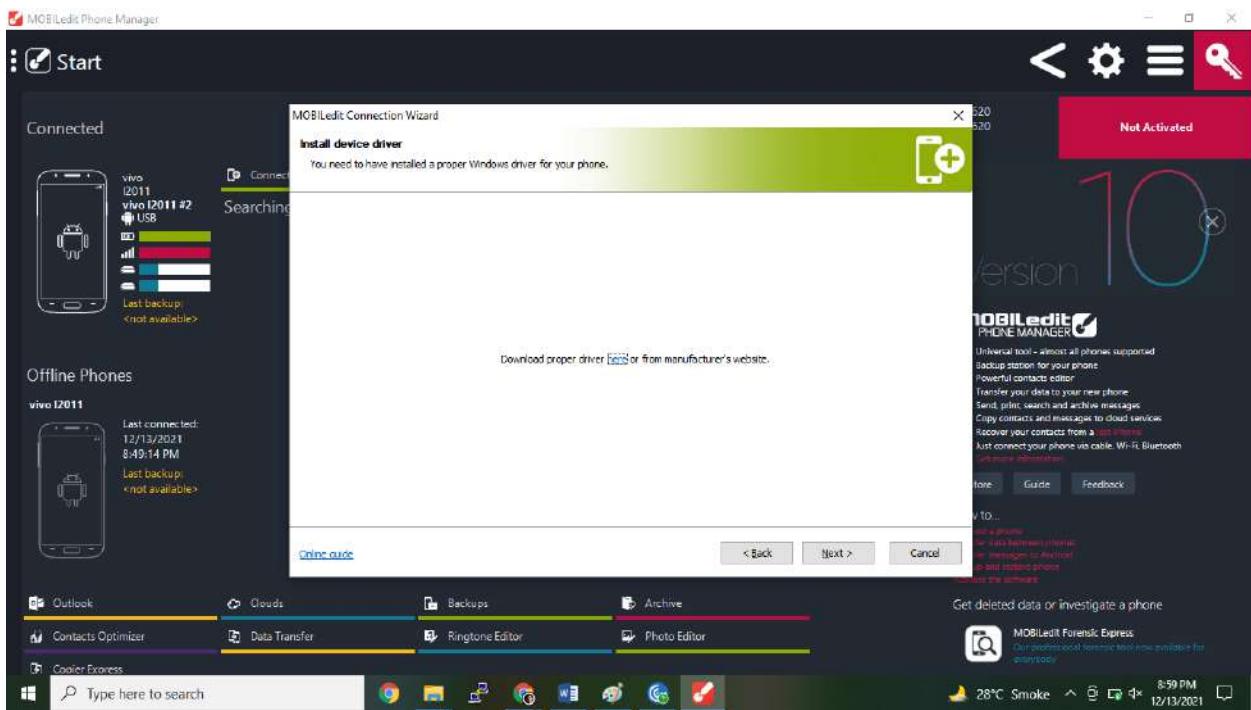
Then double click on Connection Wizard.



Then select and click on Next.

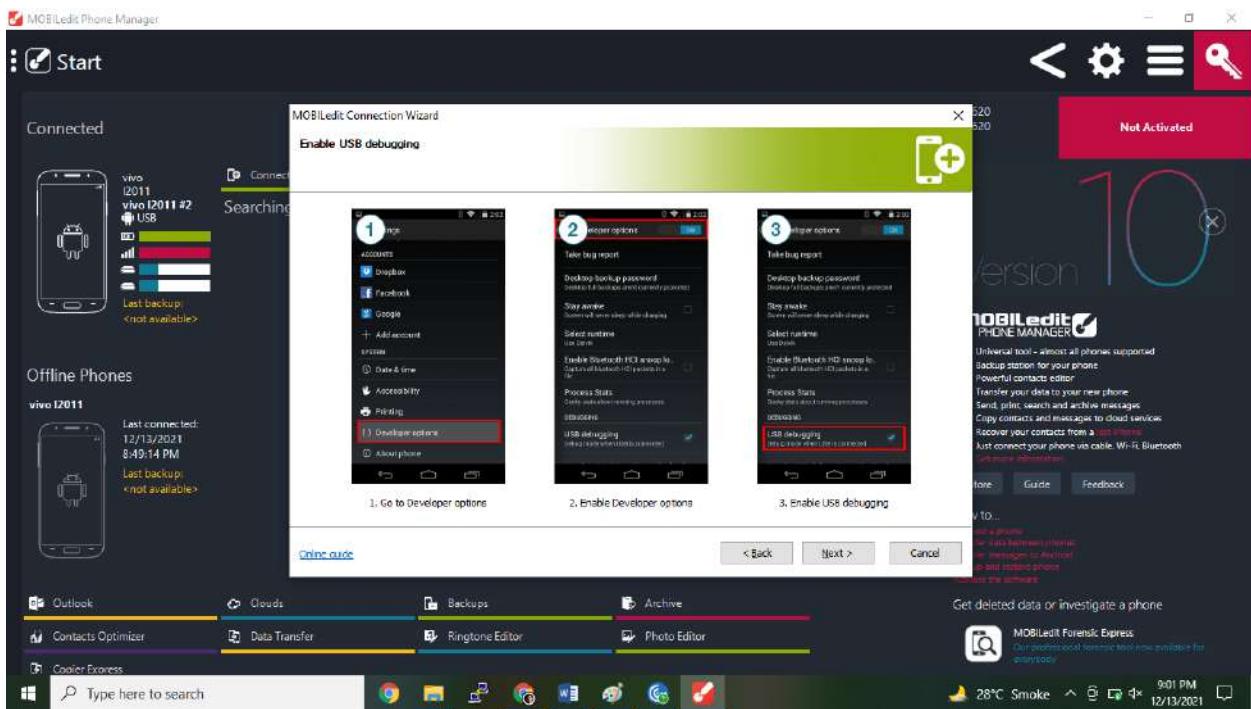
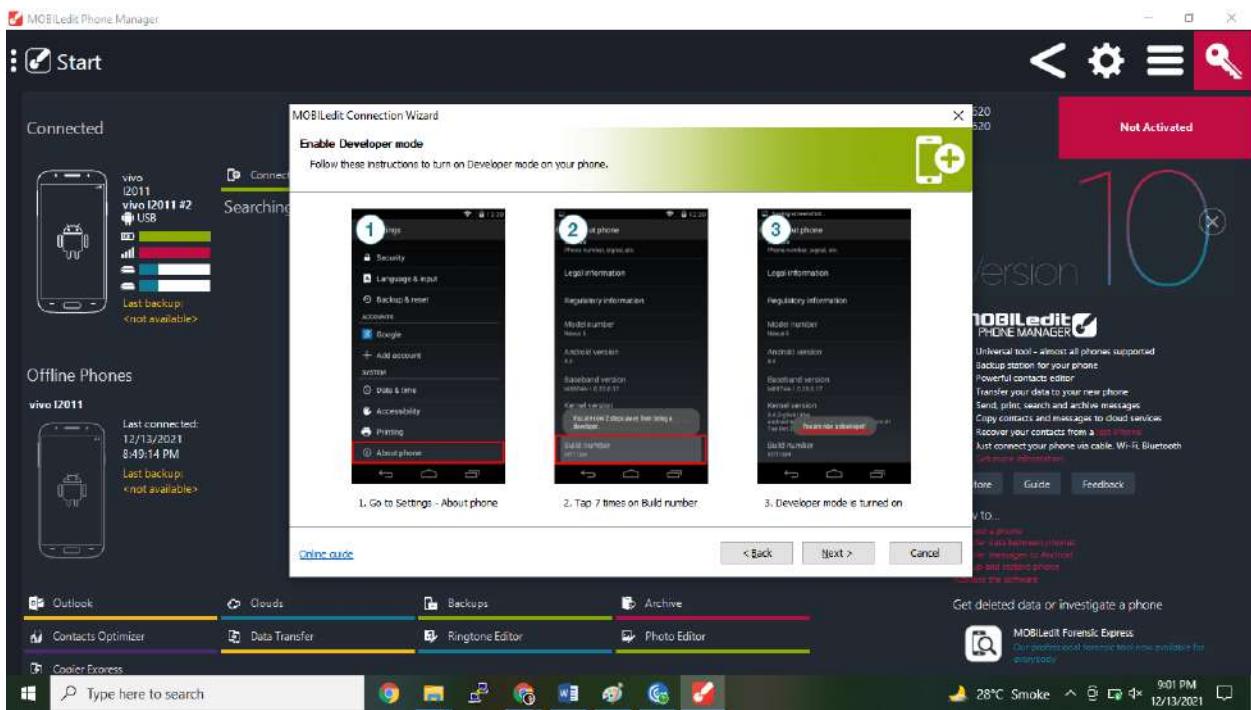


Click on here.

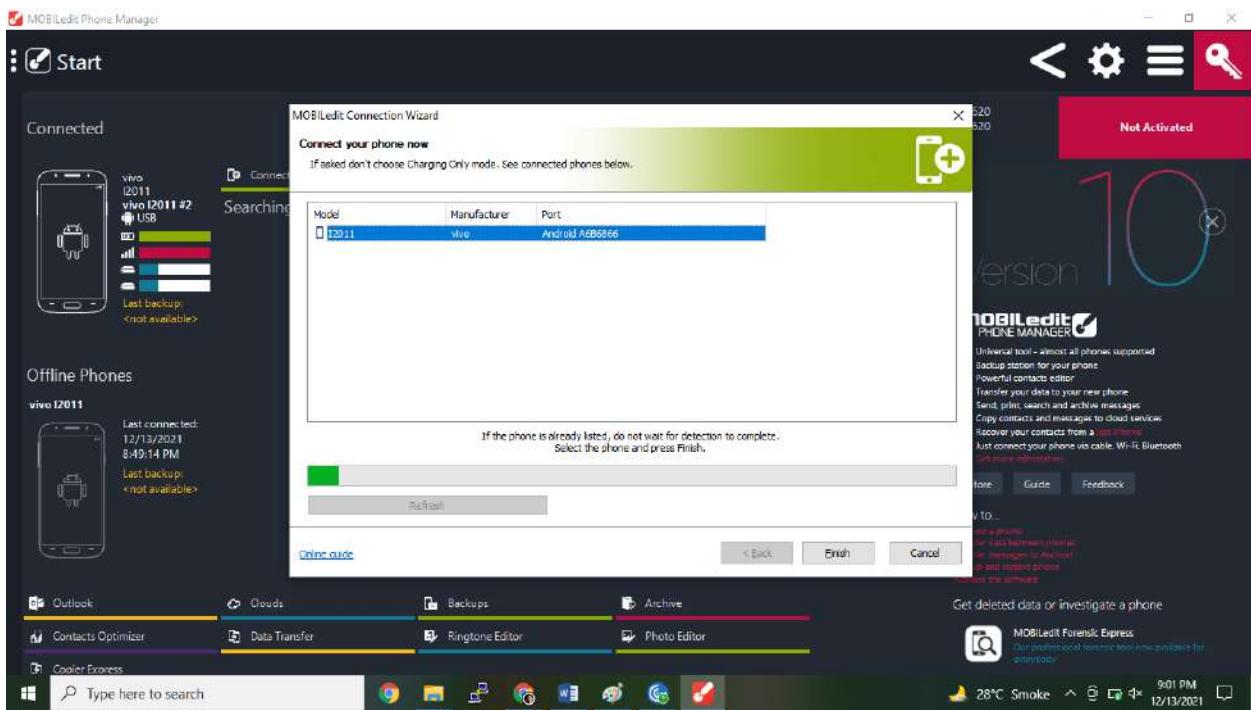


Download Universal Android Driver.

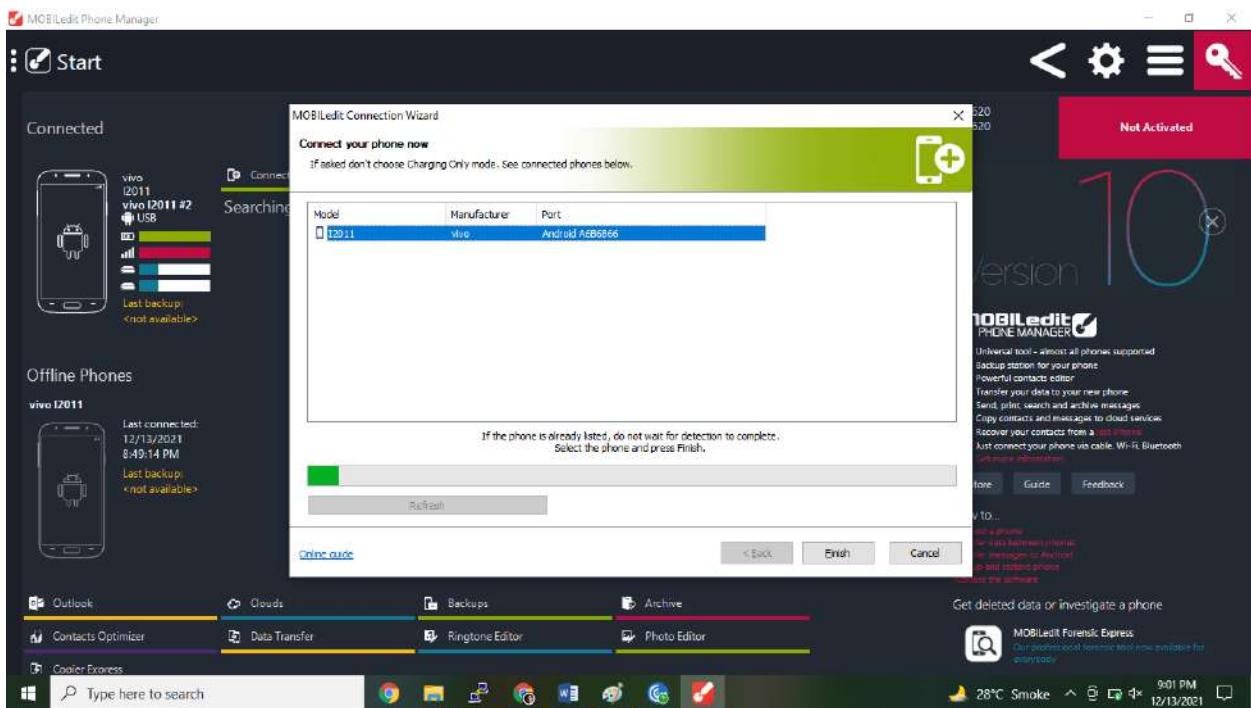
A screenshot of a web browser window showing the MOBILedit website. The URL is https://www.mobiledit.com/downloads#phone-drivers. The page title is 'Phone drivers'. It lists four options: 'Universal Android driver' (with a download button), 'Apple device drivers' (with a download button), 'Unlocking drivers' (with a download button), and 'Individual USB phone drivers' (with a 'CLICK HERE FOR MORE DETAILS' link). The browser's address bar shows the URL, and the taskbar at the bottom shows the same application icons as the previous screenshot.



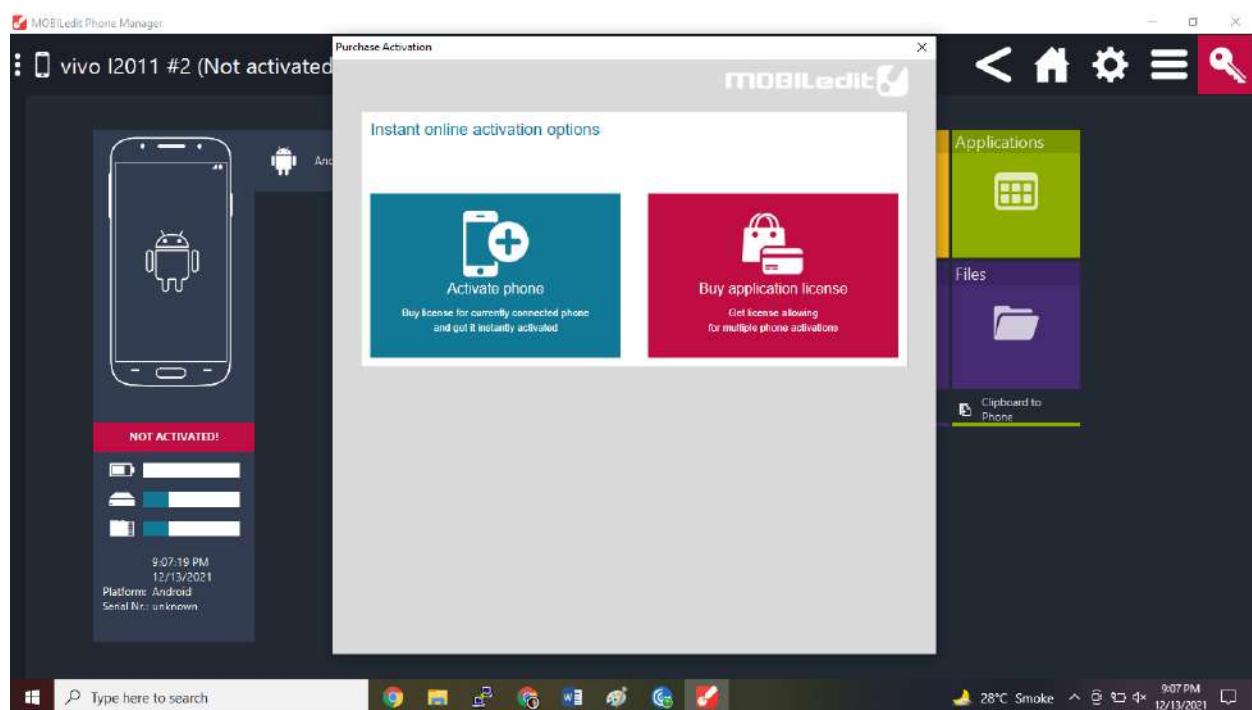
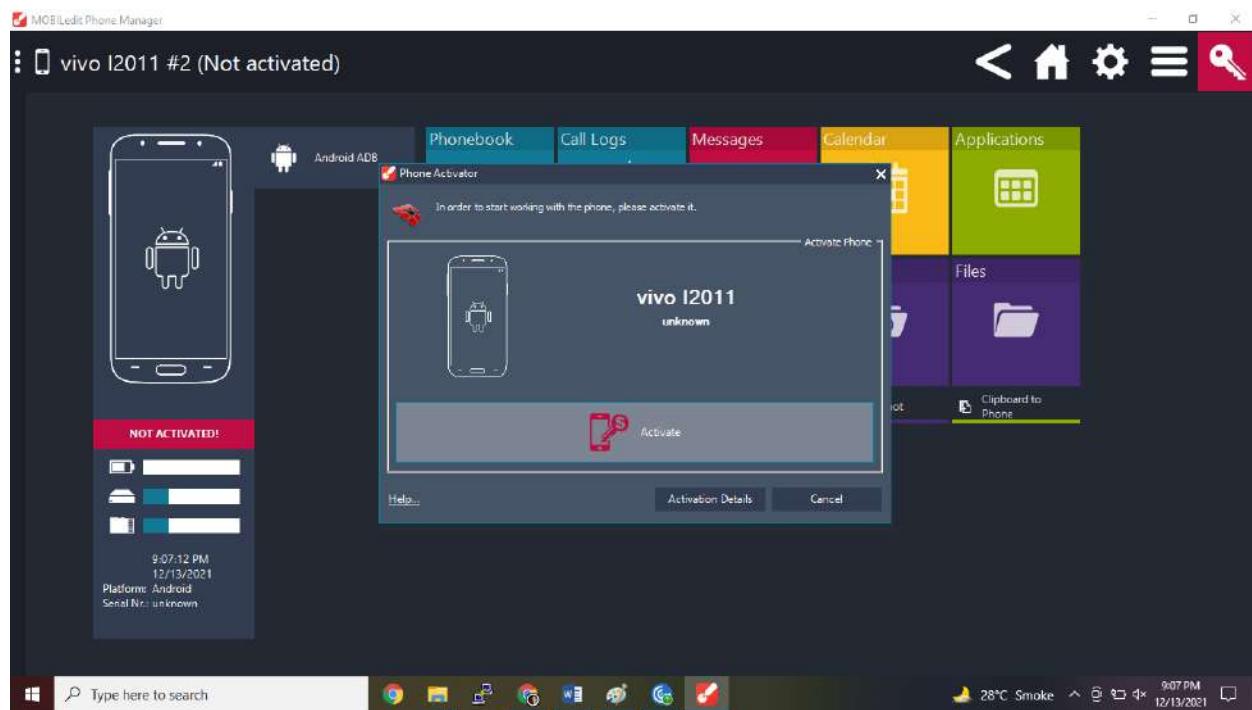
Your phone will appear here.



Click on Finish.



If you Activate the Phone Activator



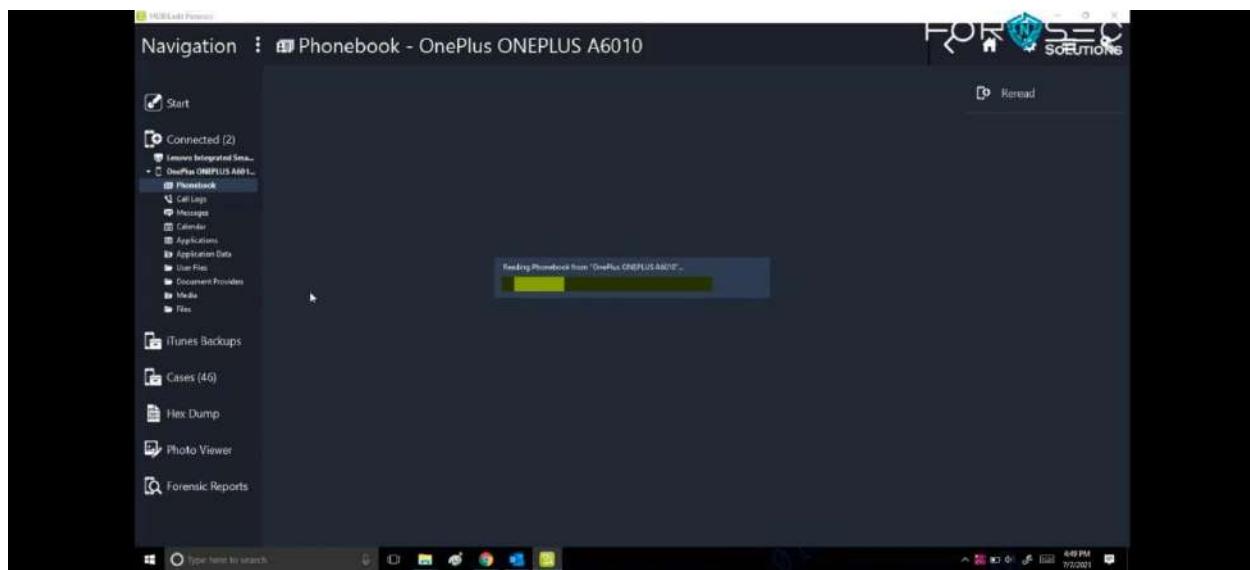
The screenshot shows a web browser window for MOBILedit Forensic. The page displays a cart summary for a 'MOBILedit Phone Manager Single Phone License' priced at 2,761.28 INR. Below the cart, there are sections for 'Billing Information' (Email: [redacted], License to: [redacted]) and 'Payment Information' (Credit Card). A TLS SECURE logo is visible in the top right corner. The bottom of the screen shows a taskbar with various icons and a system tray indicating 28°C, AQI 148, and the date 12/13/2021.

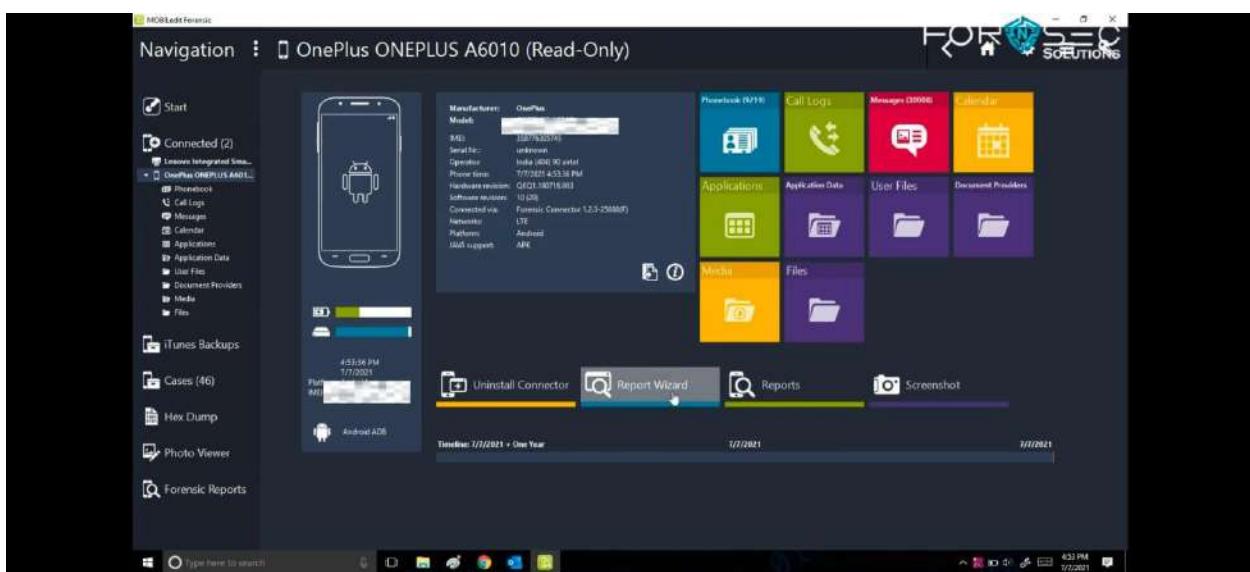
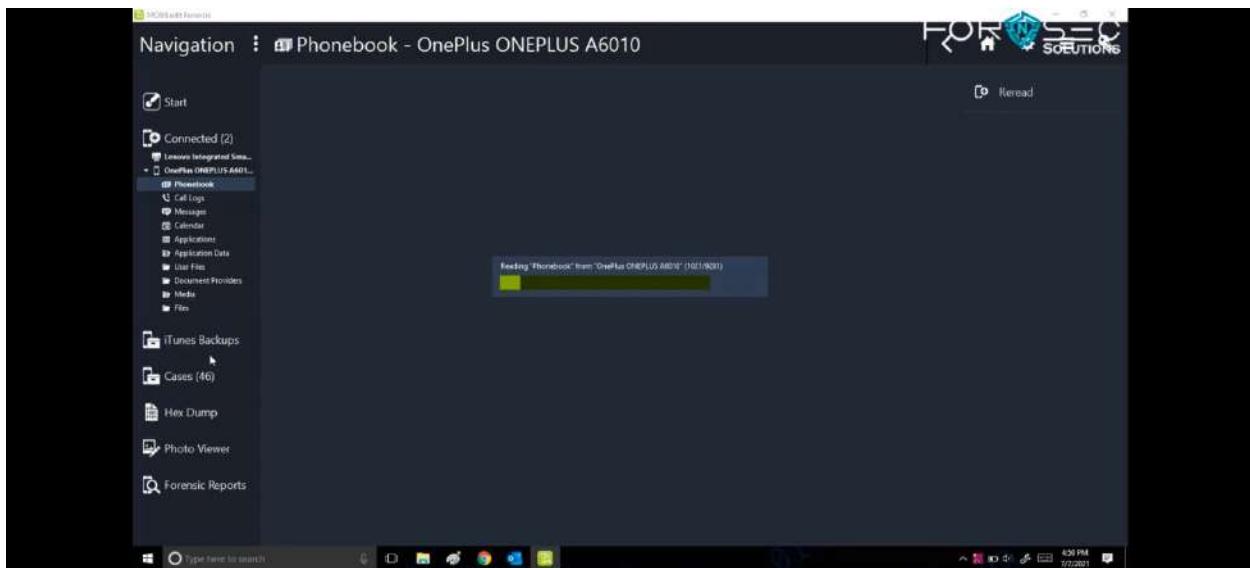
You need to purchase Activation in order to see all the details from mobile device.

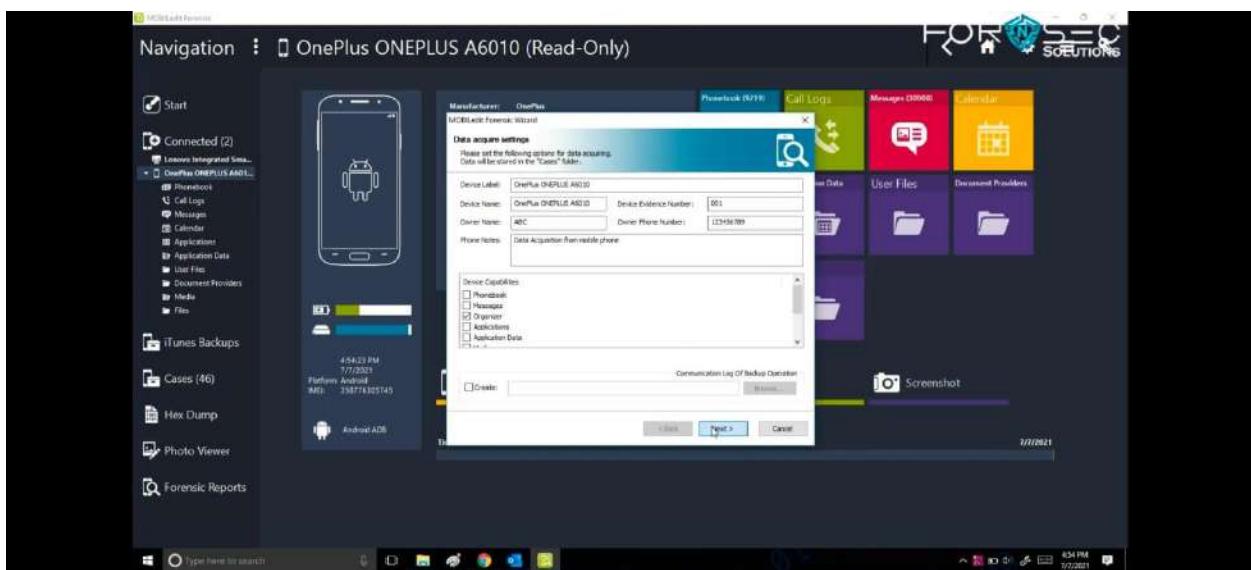
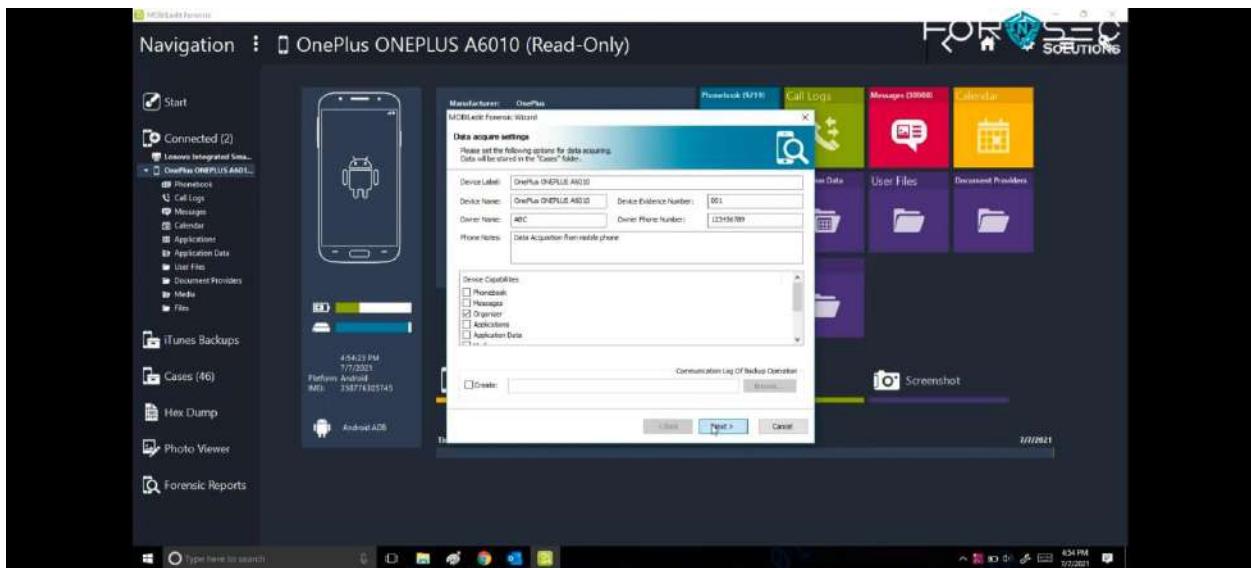
After that you will get to see the details as follows. You can see all the details from mobile device, you can also make a report from it, you can export the data as well and get the report for your investigation.

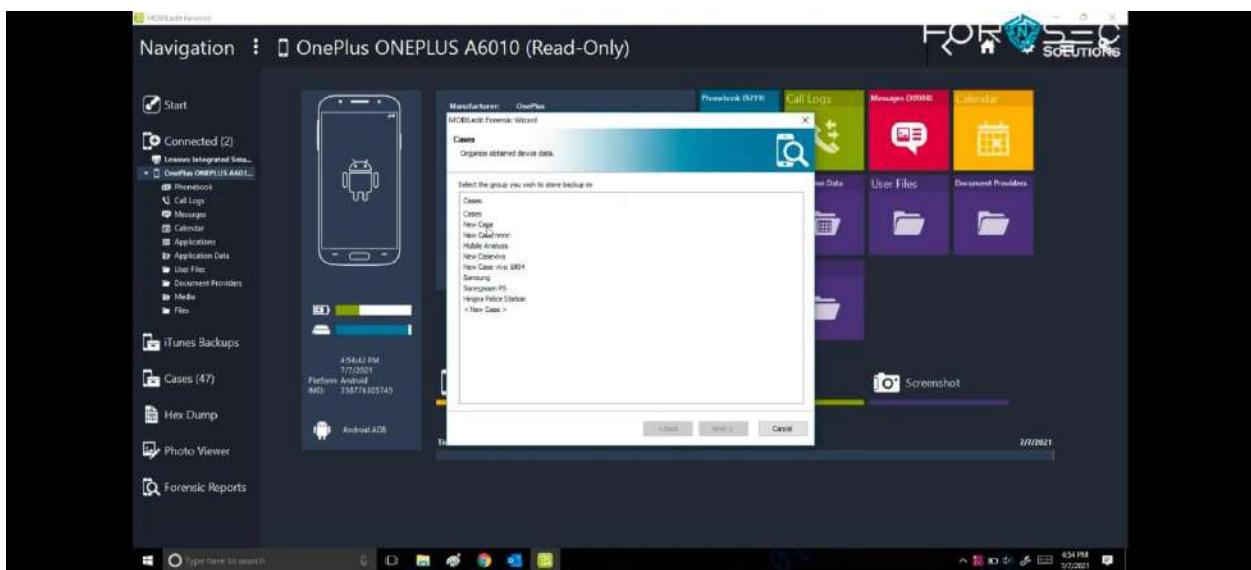
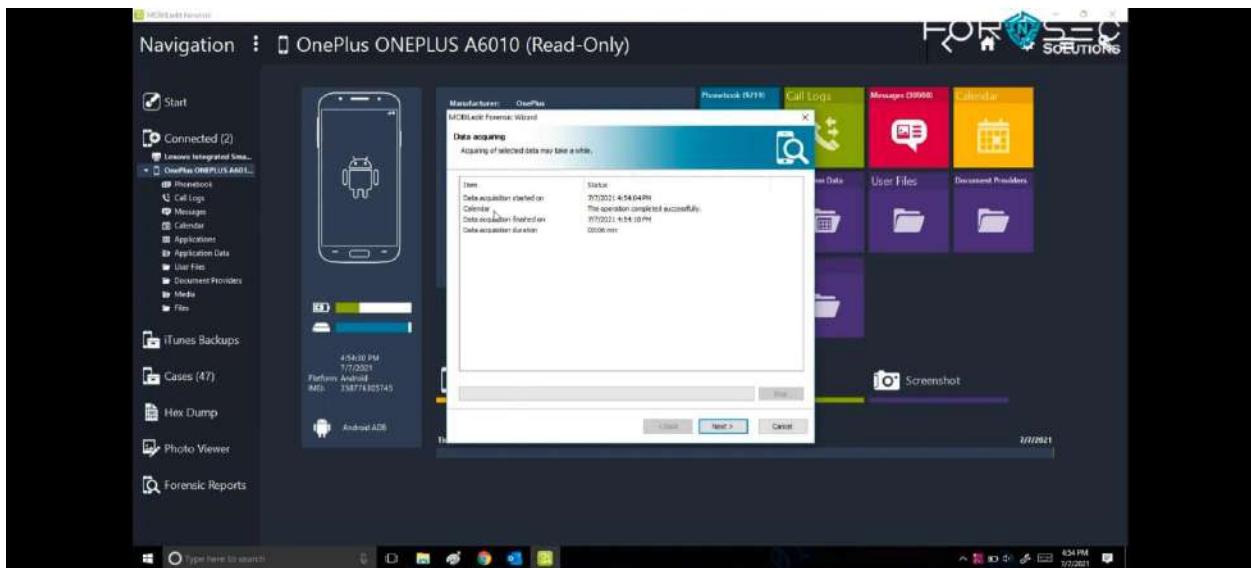


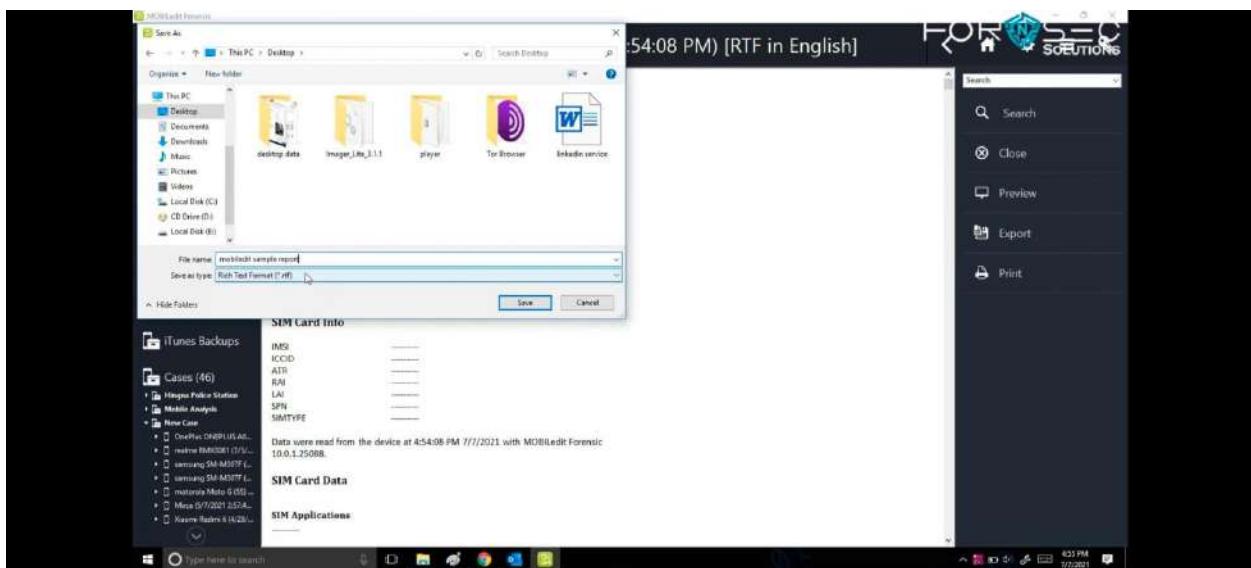
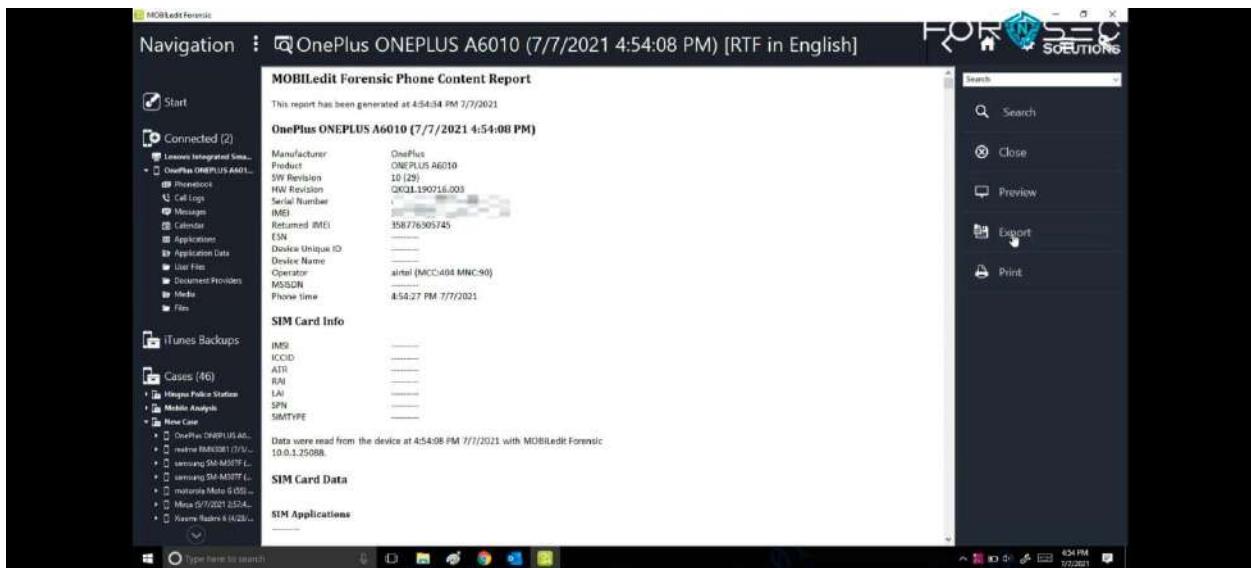
The screenshot shows the MOBILedit Forensic software interface. It displays a mobile device analysis session for an 'OnePlus ONEPLUS A6010 (Read-Only)'. The left sidebar includes options like Start, Connected (2), Phonetime, Applications, User Files, Document Providers, Media, and Tools. The main area shows device details (Manufacturer: OnePlus, Model: ONEPLUS A6010, IMEI: [redacted], Operator: India (800) 90 vodafone, Phone time: 2021-12-13 4:48:08 PM, Software version: 10.0.0.1000, Connected via: Fornic Connector 1.2.3-250(MF)), network information (Network: 4G LTE, Platform: Android, APN: [redacted]), and memory (Phone memory: 4.41 GB (470 free of 10.82 GB)). To the right, there are several tabs: Phonebook, Call Logs, Messages, Calendar, Applications, Application Data, User Files, Document Providers, Media, and Files. At the bottom, there are buttons for Uninstall Connector, Report Wizard, Reports, and Screenshot.

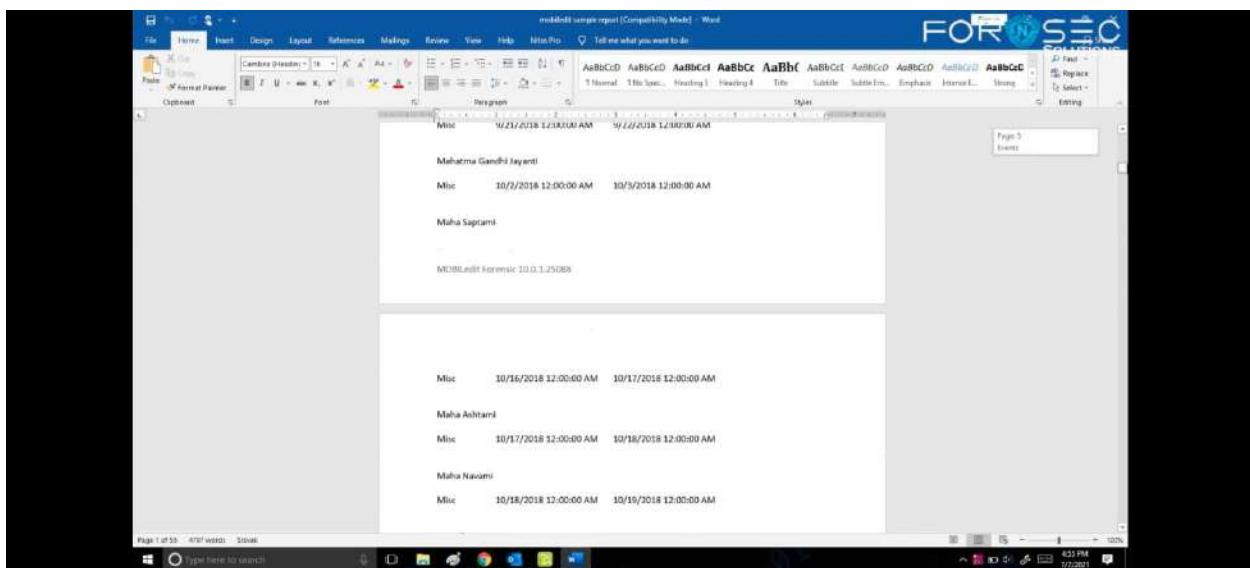
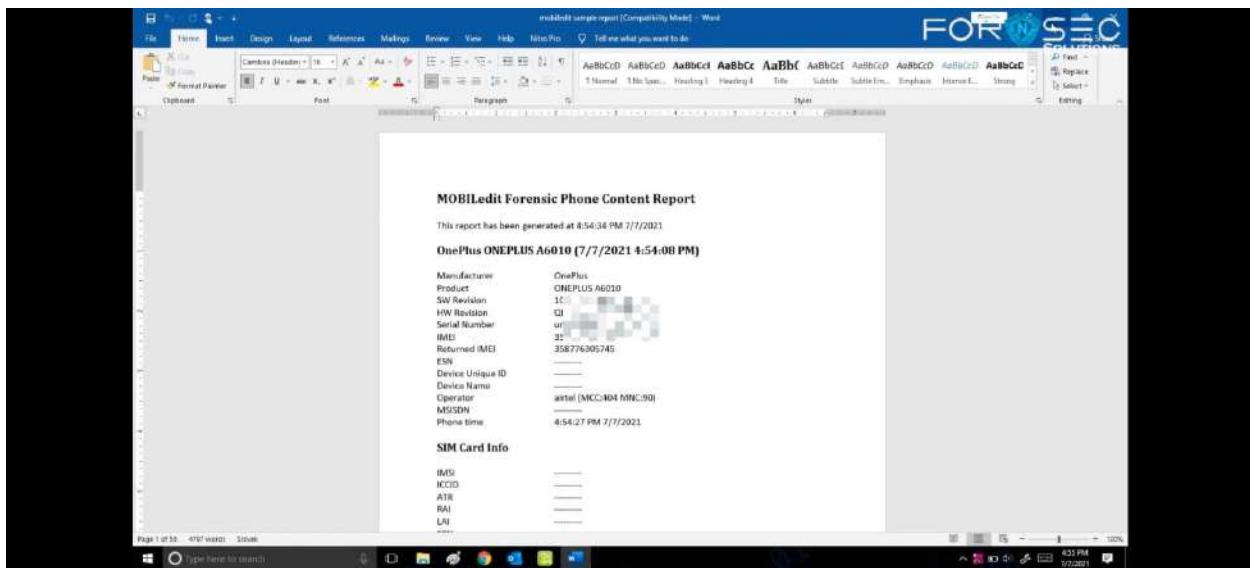












Practical No. 14

Aim: Forensic Investigation Using EnCase

What is Forensic Investigation?

Forensics are the scientific methods used to solve a crime. Forensic investigation is the gathering and analysis of all crime-related physical evidence in order to come to a conclusion about a suspect. Investigators will look at blood, fluid, or fingerprints, residue, hard drives, computers, or other technology to establish how a crime took place. This is a general definition, though, since there are a number of different types of forensics.

Types of Forensic Investigation:

- Forensic Accounting / Auditing
- Computer or Cyber Forensics
- Crime Scene Forensics
- Forensic Archaeology
- Forensic Dentistry
- Forensic Entomology
- Forensic Graphology
- Forensic Pathology
- Forensic Psychology
- Forensic Science
- Forensic Toxicology

EnCase Tool

EnCase is the shared technology within a suite of digital investigations products by Guidance Software (acquired by OpenText in 2017). The software comes in several products designed for forensic, cyber security, security analytics, and e-discovery use. EnCase is traditionally used in forensics to recover evidence from seized hard drives. EnCase allows the investigator to conduct in depth analysis of user files to collect evidence such as documents, pictures, internet history and Windows Registry information.

The company also offers EnCase training and certification.

Data recovered by EnCase has been used in various court systems, such as in the cases of the BTK Killer and the murder of Danielle van Dam. Additional EnCase forensic work was documented in other cases such as the evidence provided for the Casey Anthony, Unabomber, and Mucko (Wakefield Massacre) cases.

Features

EnCase contains tools for several areas of the digital forensic process; acquisition, analysis and reporting. The software also includes a scripting facility called EnScript with various API's for interacting with evidence.

Expert Witness File Format

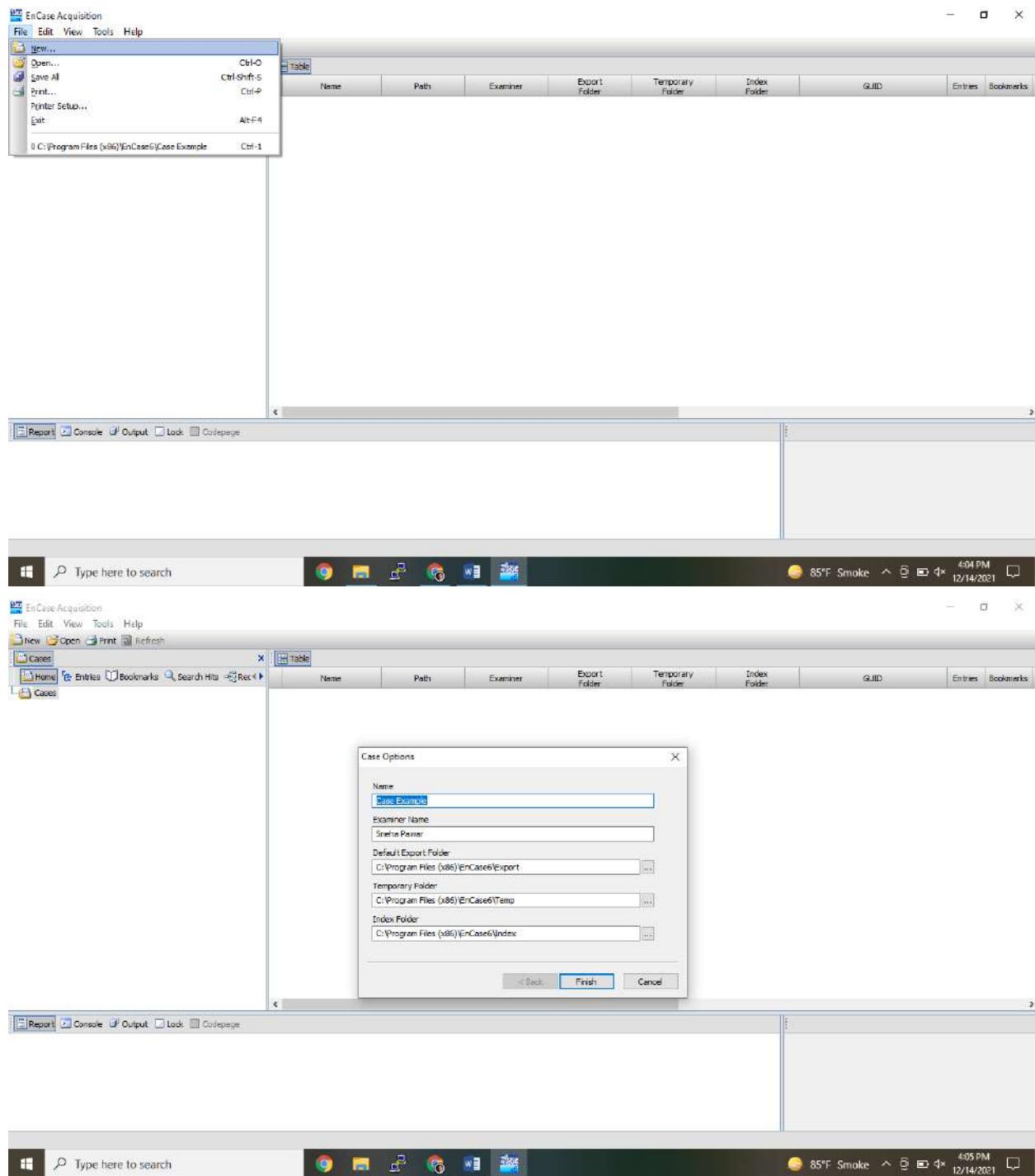
EnCase contains functionality to create forensic images of suspect media. Images are stored in proprietary Expert Witness File format; the compressible file format is prefixed with case data information and consists of a bit-by-bit (i.e. exact) copy of the media inter-spaced with CRC hashes for every 64K of data. The file format also appends an MD5 hash of the entire drive as a footer.

Mobile forensics

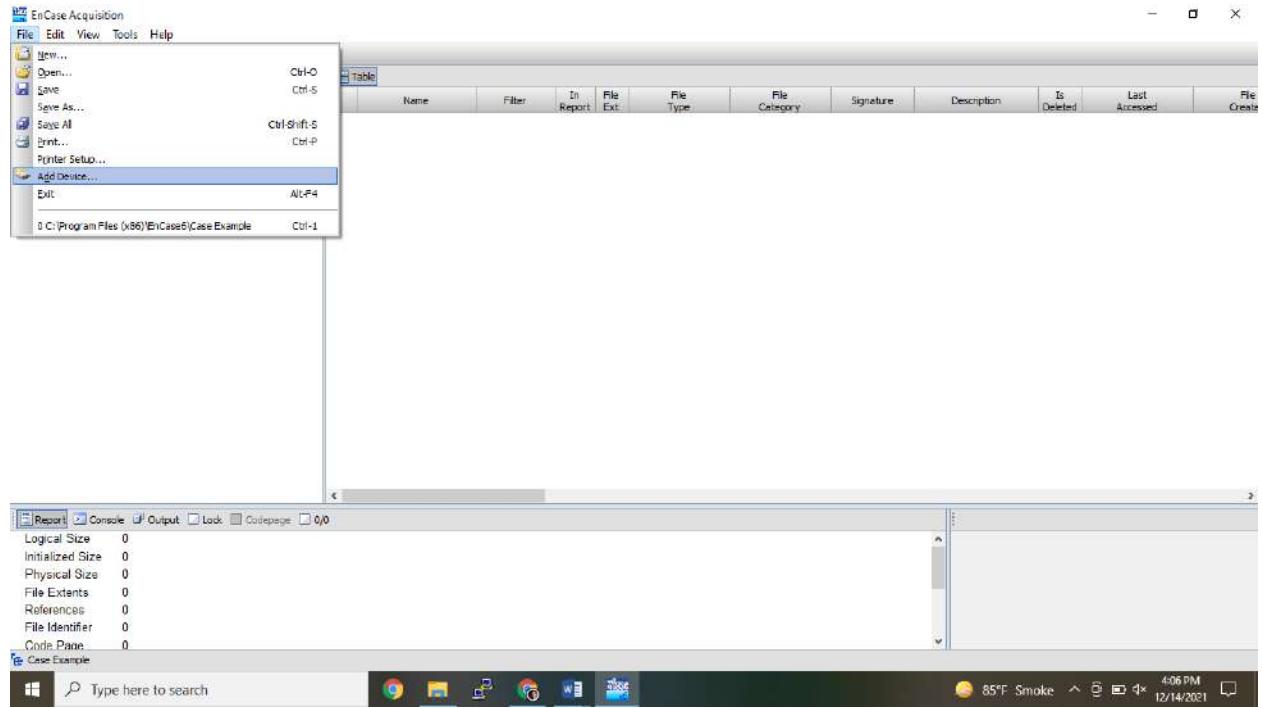
As of EnCase V7, Mobile Phone Analysis is possible with the addition some add-ons available from Guidance Software.

Creating a new Case and Adding Evidence in Encase

Click on New – Case – Fill details as required.



To Add Evidence – Click on File – Add device

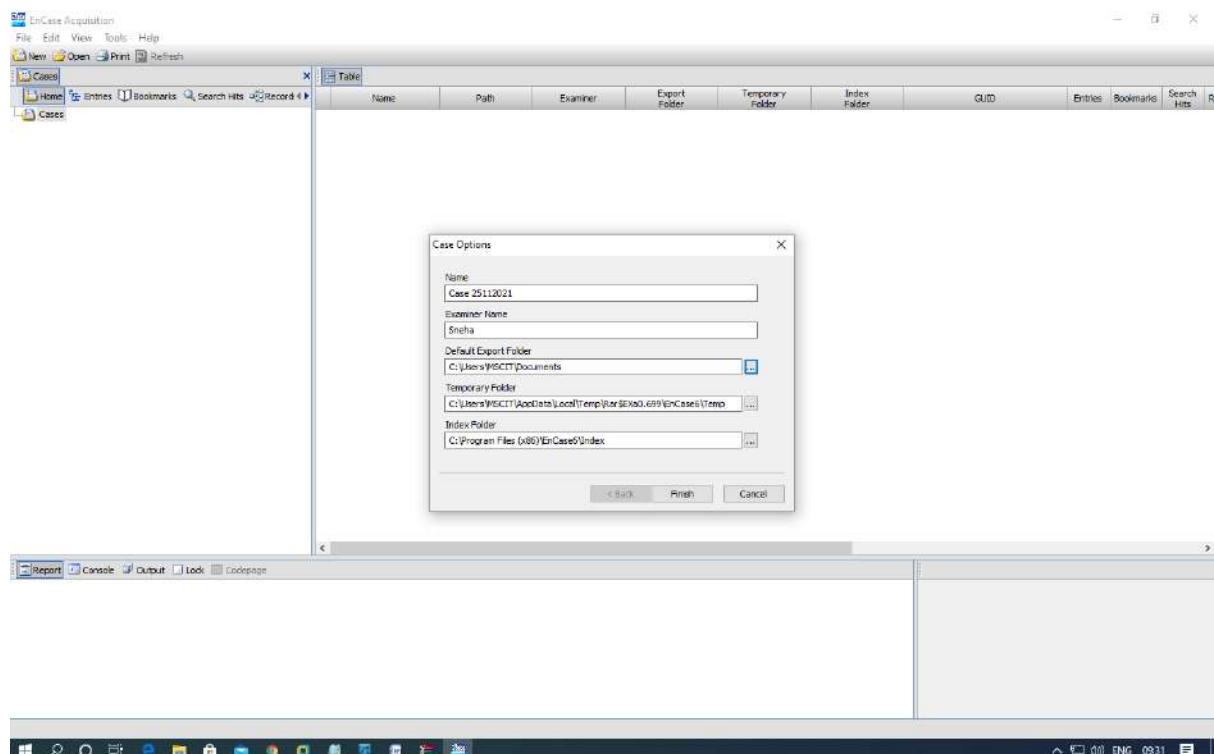
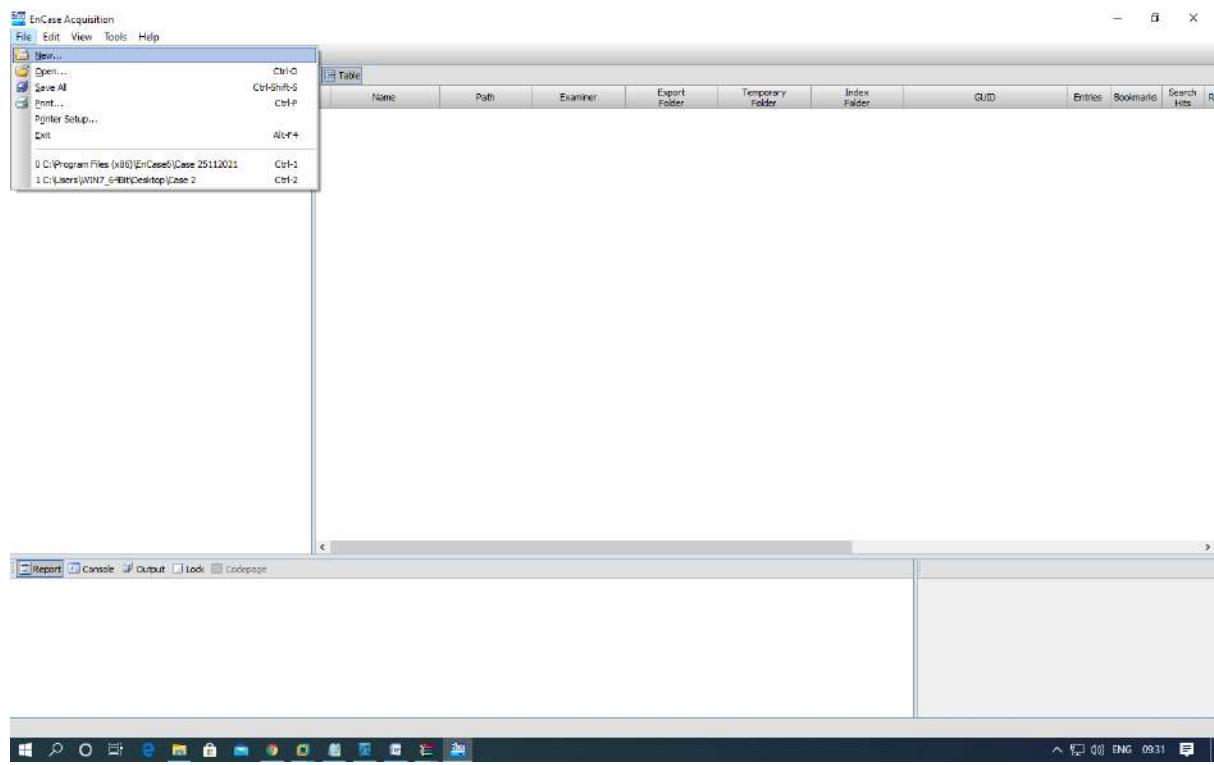


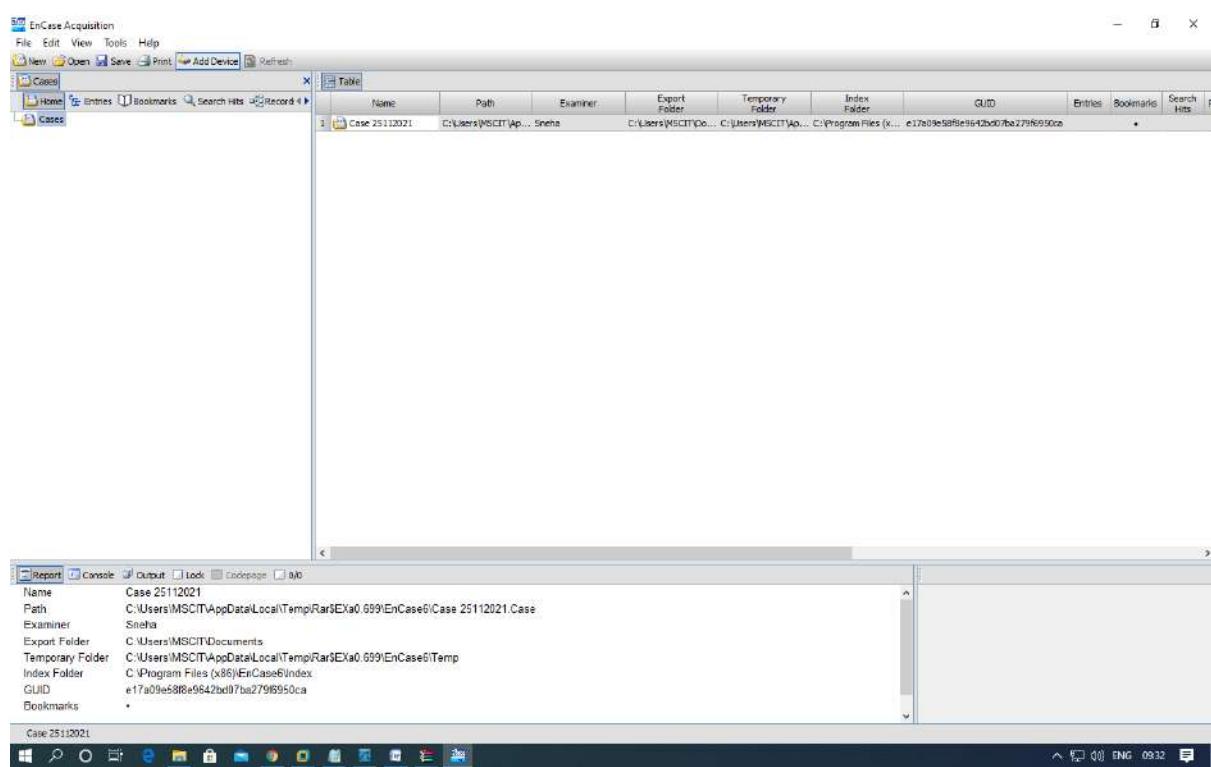
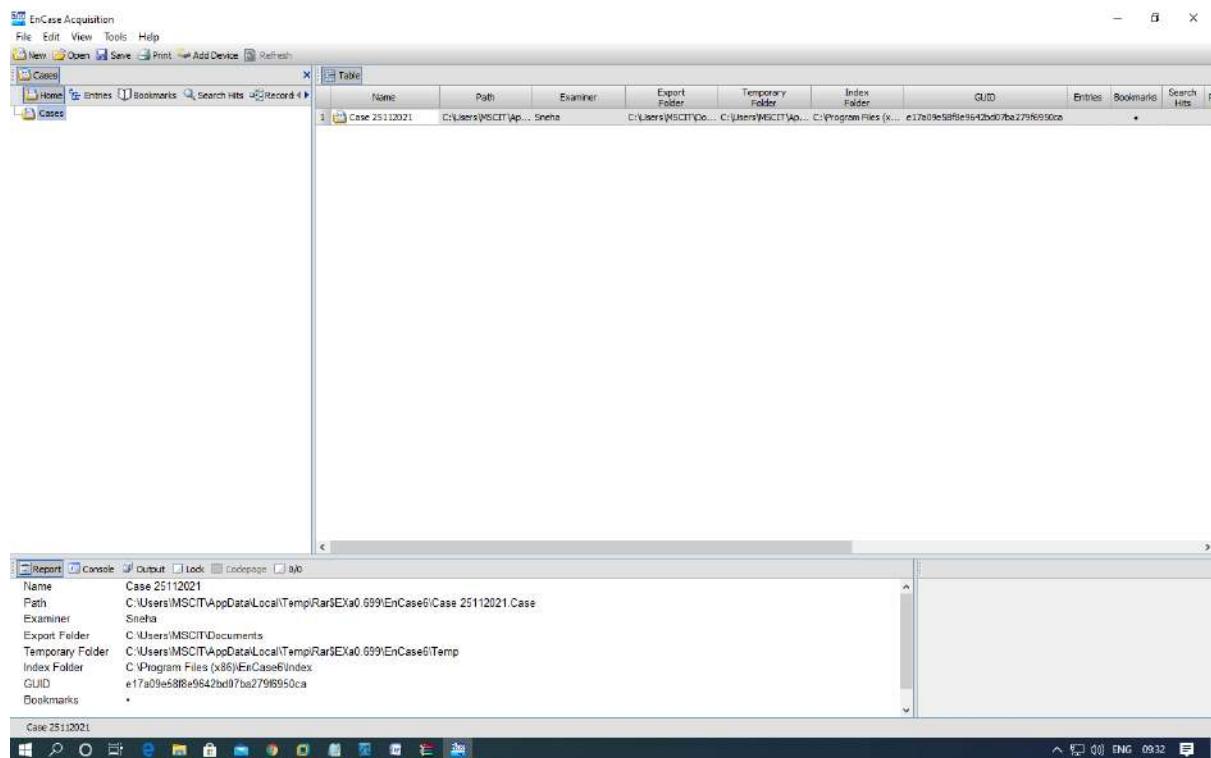
Select whichever device you want to add which contains your evidence.

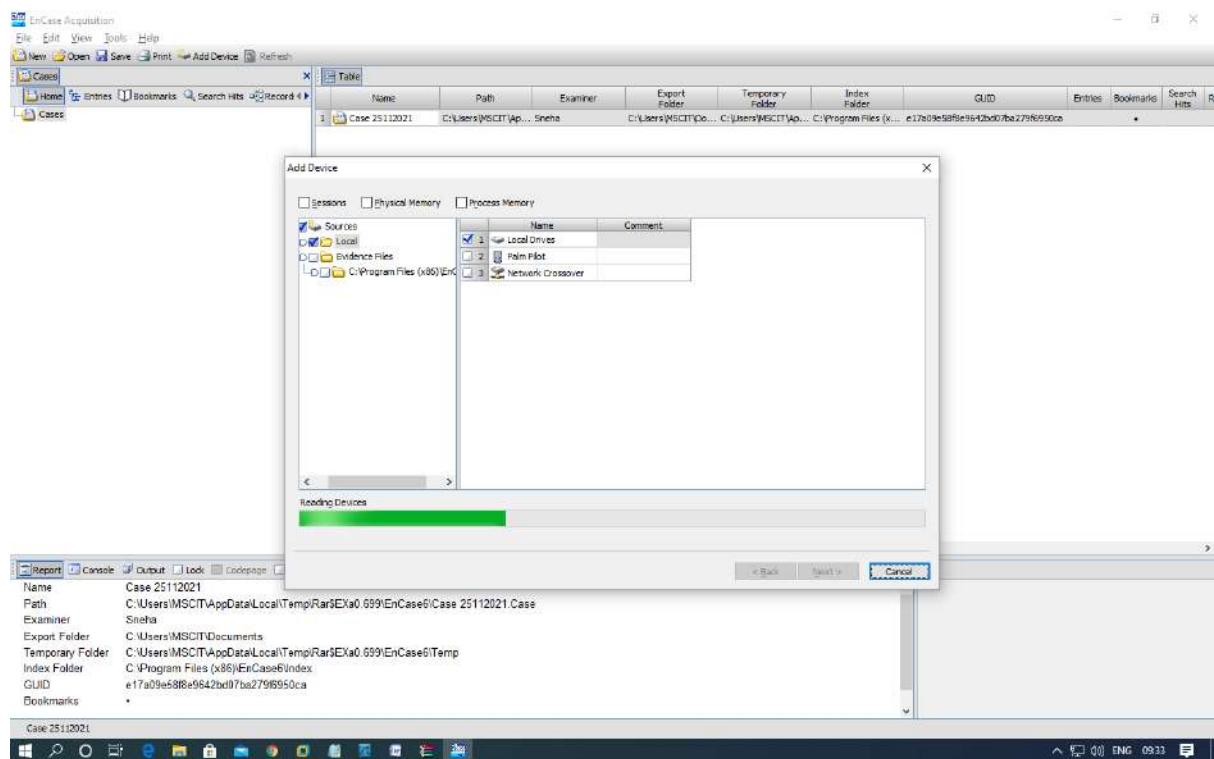
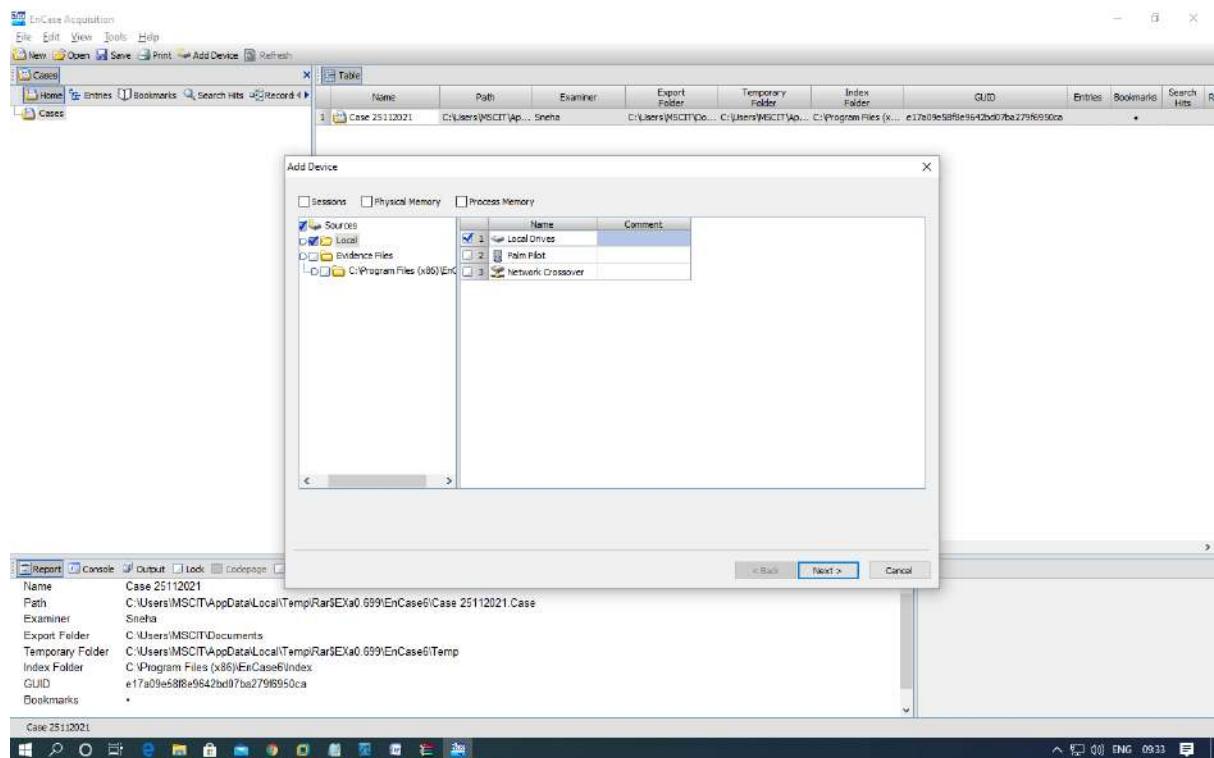
Here I have selected Hard Disk drive.

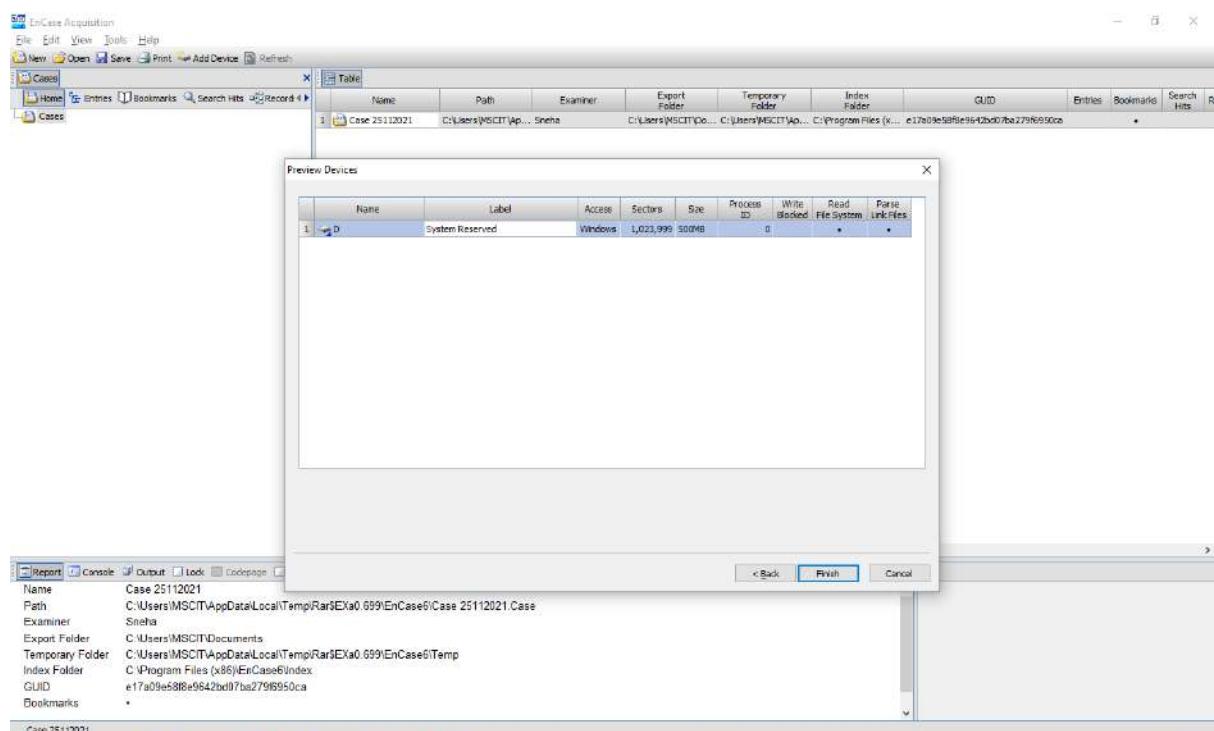
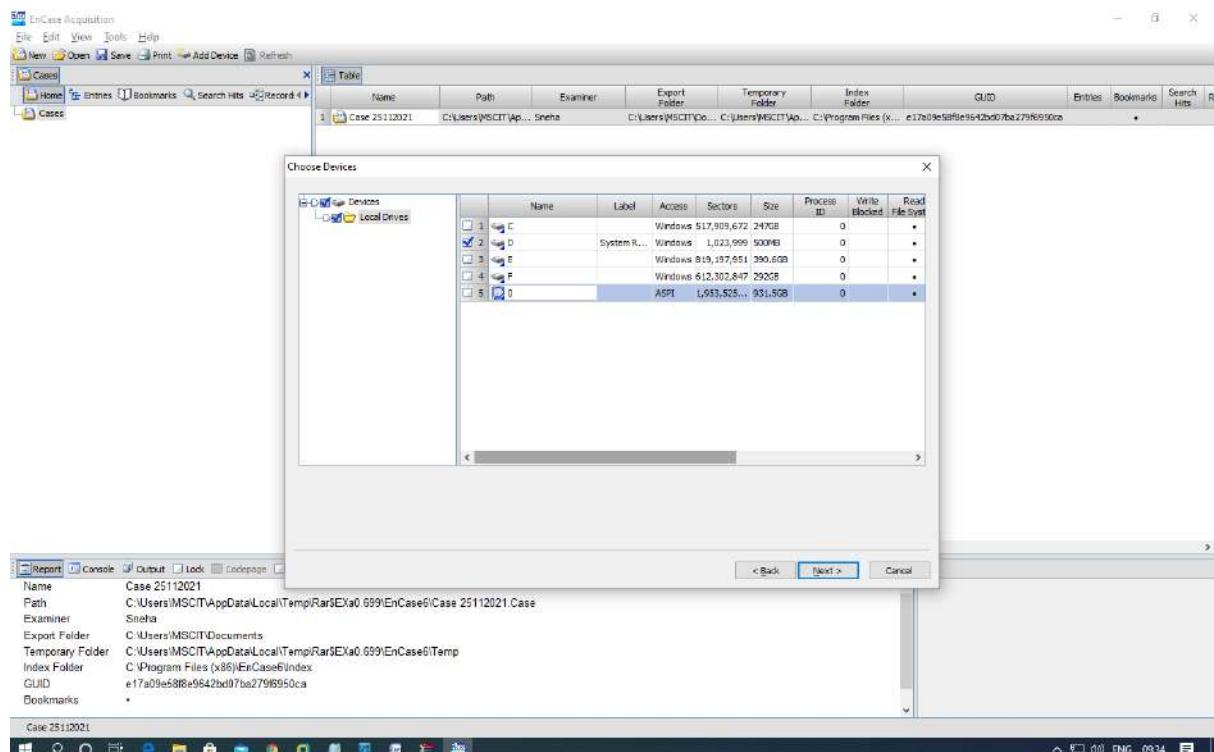
You can also select Palm Pilot and Network crossover.

Palm Pilot: - By using the Palm Pilot the user could keep notes, manage contacts, play games, and view and manage other documents. The palm pilot receives input by means of a stylus. Users holds the stylus like a pen, tapping the screen with the tip to interact with buttons and menus.









EnCase Acquisition

File Edit View Tools Help

New Open Save Print Add Device Refresh

Case Table

Name Filter In Report File Ext File Type File Category Signature Description Is Deleted Last Accessed File Created

Volume, Sector 0-102399...

D

Report Console Output Lock Codepage 8/2

Name D
Description Volume, Sector 0-1023999, 500MB
File Acquired 12/17/21 09:34:24AM
Logical Size 0
Initialized Size 0
Physical Size 0
File Extents 0
References 0
Evidence File D

Case 25112021:D (D:\E0)

Windows taskbar: File Explorer, Control Panel, Task View, Start, Taskbar settings, Network, File History, Task Scheduler, Task Manager, Task View, Taskbar settings, Network, File History, Task Scheduler, Task Manager

EnCase Acquisition

File Edit View Tools Help

New Open Save Print Add Device Refresh Close Acquire

Case Table

Name Filter In Report File Ext File Type File Category Signature Description Is Deleted Last Accessed File Created

Volume, Sector 0-102399...

D

Report Console Output Lock Codepage 8/2

Name D
Description Volume, Sector 0-1023999, 500MB
File Acquired 12/17/21 09:34:24AM
Logical Size 0
Initialized Size 0
Physical Size 0
File Extents 0
References 0
Evidence File D

Case 25112021:D (D:\E0)

Windows taskbar: File Explorer, Control Panel, Task View, Start, Taskbar settings, Network, File History, Task Scheduler, Task Manager, Task View, Taskbar settings, Network, File History, Task Scheduler, Task Manager

