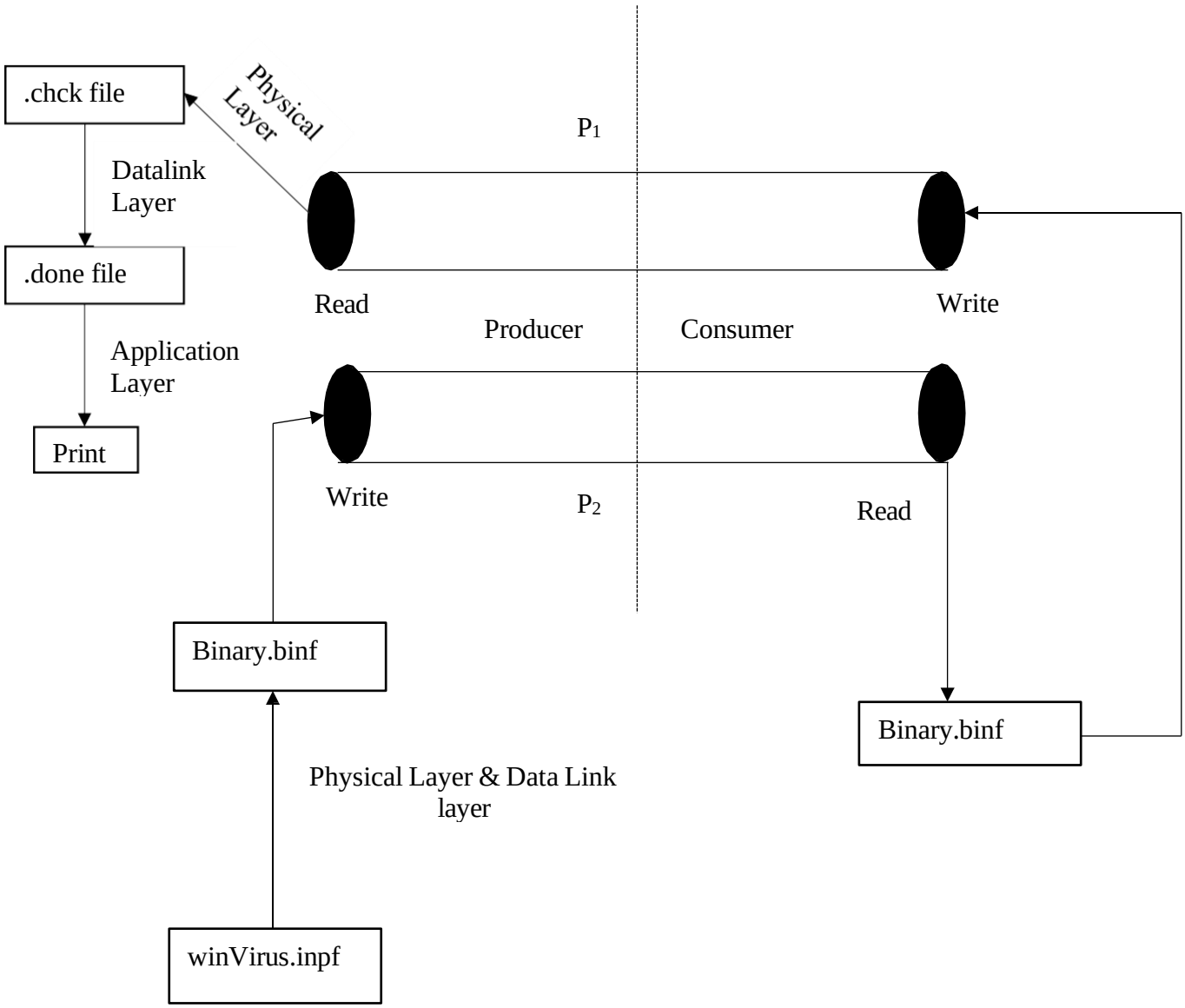
Table of Contents

System Documentation

i. High-level data flow diagram for the system



ii. List or routines and their brief description

a) #include<sys/wait.h > :

Used to implement wait while using fork processes

b) pipe( ) :

Creates a pipe that can be used for inter-process communication

c) fork( ) :

It is a system used to create parent and child processes.

d) execl( ) :

It is a system call function from exec family to execute other c- programs by replacing the existing process.

iii. Implementation Details

I have developed a C program that performs an Inter-process communication between two ordinary pipes based on Producer and Consumer. I have created two pipes and a fork which has a process ID that helps me identify parent and child processes or Producer and Consumer processes.
The main function takes the input file ***input.inpf*** and sends to the application layer where it takes input file name and reads the file and sends the data to data link layer which breaks the data into respective frames with maximum size of 32 characters from there the datalink layer functions will pass the frames to physical layer where each and every frame and all the characters in it will be converted to either binary or ASCII 22 based on the calling functions like decode or encode.
The binary file ***.binf*** that was created will be shared to consumer by means of pipe and there this binary file is decoded and ***.chck*** file is generated accordingly after converting all the characters to upper case and the ***.chck*** file that is created is encoded again and the file name is shared to producer by means of a different pipe. Finally, the producer reads the ***.chck*** file and creates a .done file as per the ***.chck*** file data after decoding.

Test Documentation

i) How you tested your program

I have used the *winVirus.inpf* given in the question to test my code.

Joke:
McAfee-Question: Is Windows a virus?
No, Windows is not a virus. Here's what viruses do:
1. They replicate quickly-okay, Windows does that.
2. Viruses use up valuable system resources, slowing down the system as they do so-okay, Windows does that.
3. Viruses will, from time to time, trash your hard disk-okay, Windows does that too.
4. Viruses are usually carried, unknown to the user, along with valuable programs and systems. Sign... Windows does that, too.
5. Viruses will occasionally make the user suspect their system is too slow (see 2.) and the user will buy new hardware. Yup, that's with Windows, too. Until now it seems Windows is a virus but there are fundamental differences: Viruses are well supported by their authors, are running on most systems, their program code is fast, compact and efficient and they tend to become more sophisticated as they mature.
So, Windows is not a virus. It's a bug.

ii) List of your test sets including the results obtained by each set

JOKE:
MCAFEE-QUESTION: IS WINDOWS A VIRUS?
NO, WINDOWS IS NOT A VIRUS. HERE'S WHAT VIRUSES DO:
1. THEY REPLICATE QUICKLY-OKAY, WINDOWS DOES THAT.
2. VIRUSES USE UP VALUABLE SYSTEM RESOURCES, SLOWING DOWN THE SYSTEM AS THEY DO SO-OKAY,
WINDOWS DOES THAT.
3. VIRUSES WILL, FROM TIME TO TIME, TRASH YOUR HARD DISK-OKAY, WINDOWS DOES THAT TOO.
4. VIRUSES ARE USUALLY CARRIED, UNKNOWN TO THE USER, ALONG WITH VALUABLE PROGRAMS AND
SYSTEMS. SIGN... WINDOWS DOES THAT, TOO.
5. VIRUSES WILL OCCASIONALLY MAKE THE USER SUSPECT THEIR SYSTEM IS TOO SLOW (SEE 2.) AND THE
USER WILL BUY NEW HARDWARE. YUP, THATBS WITH WINDOWS, TOO.
UNTIL NOW IT SEEMS WINDOWS IS A VIRUS BUT THERE ARE FUNDAMENTAL DIFFERENCES:

VIRUSES ARE WELL SUPPORTED BY THEIR AUTHORS, ARE RUNNING ON MOST SYSTEMS, THEIR PROGRAM
CODE IS FAST, COMPACT AND EFFICIENT AND THEY TEND TO BECOME MORE SOPHISTICATED AS THEY
MATURE.
SO, WINDOWS IS NOT A VIRUS. IT'S A BUG

User Documentation

i) How to run your program

All the required files are in the *'CSI500_Project1_SravyaVaddi.zip'* folder Execute the below commands:

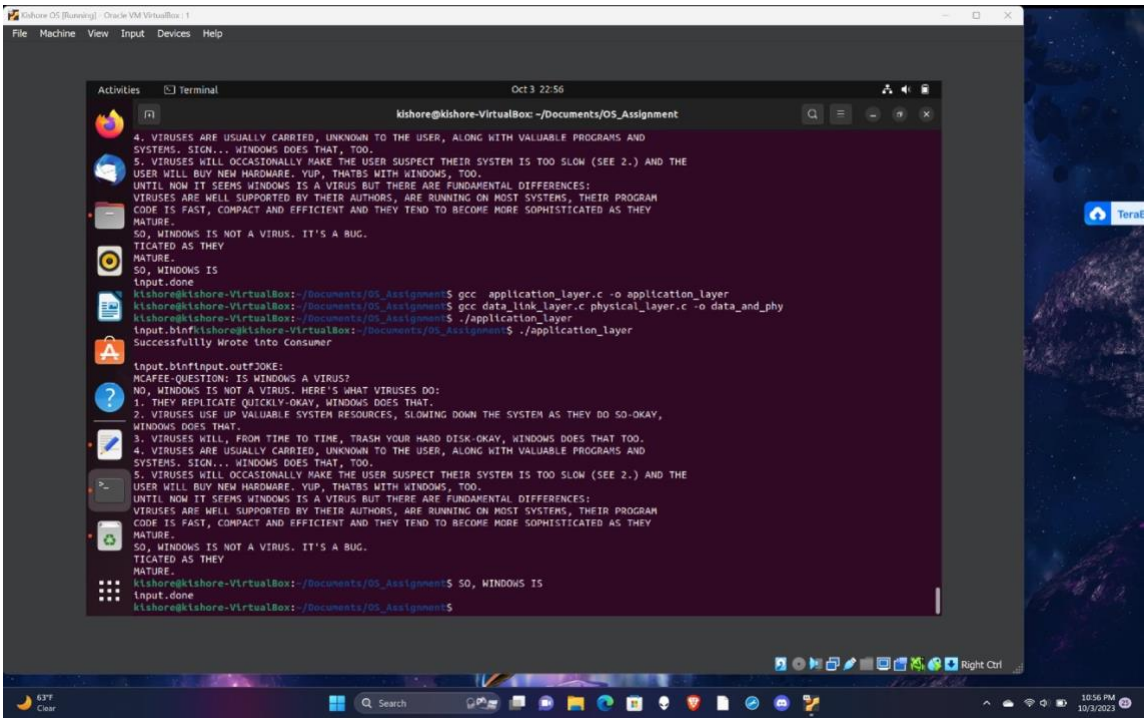
- gcc data_link_layer.c physical_layer.c -o data_and_phy
- gcc application_layer.c -o application_layer
- ./application_layer

ii) Describe any parameters

In order to make use of exec family functions we need to implement multiple forks one after the other or one in another which makes the process delay sometimes. So that, in few cases the output files may not look appropriate or complete. This happens when we are trying to implement multiple forks and keep the processes in wait.

While executing the above commands, if you find any output files that are incomplete please run the third command multiple times so that you give enough time for the files to be loaded and once all the files are loaded, you get the complete output.

Outputs:


Activities
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4. VIRUSES ARE USUALLY CARRIED, UNKNOWN TO THE USER, ALONG WITH VALUABLE PROGRAMS AND
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SO, WINDOWS IS
input.done
kishore@kishore-VirtualBox:~/Documents/OS_Assignment$ gcc application_layer.c -o application_layer
kishore@kishore-VirtualBox:~/Documents/OS_Assignment$ gcc data_link_layer.c physical_layer.c -o data_and_phy
kishore@kishore-VirtualBox:~/Documents/OS_Assignment$ ./application_layer
input.binfkishore@kishore-VirtualBox:~/Documents/OS_Assignment$ ./application_layer
Successfullly Wrote into Consumer
input.binfinput.outfJOKE:
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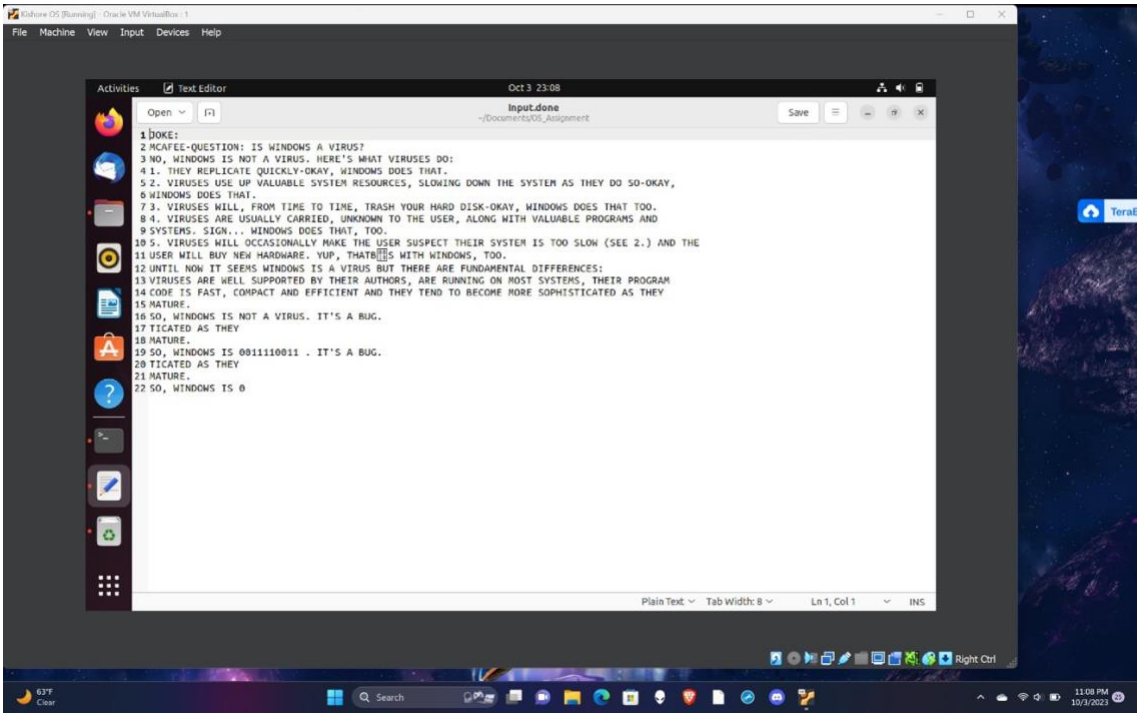
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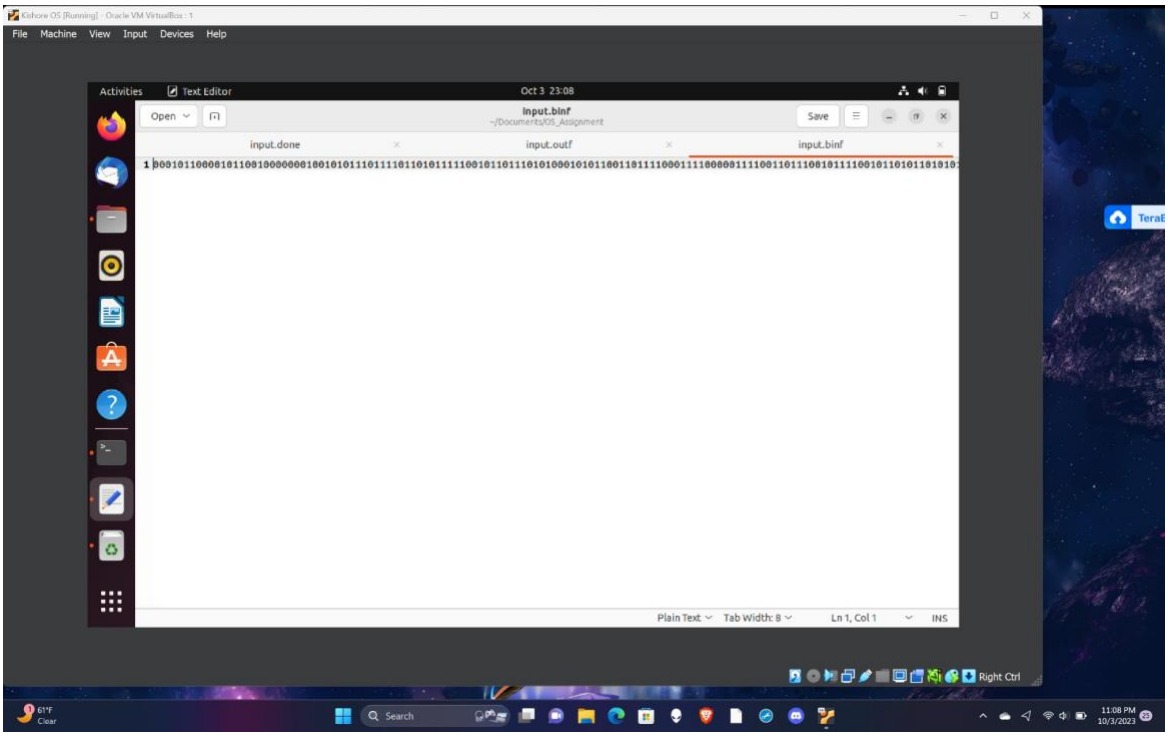
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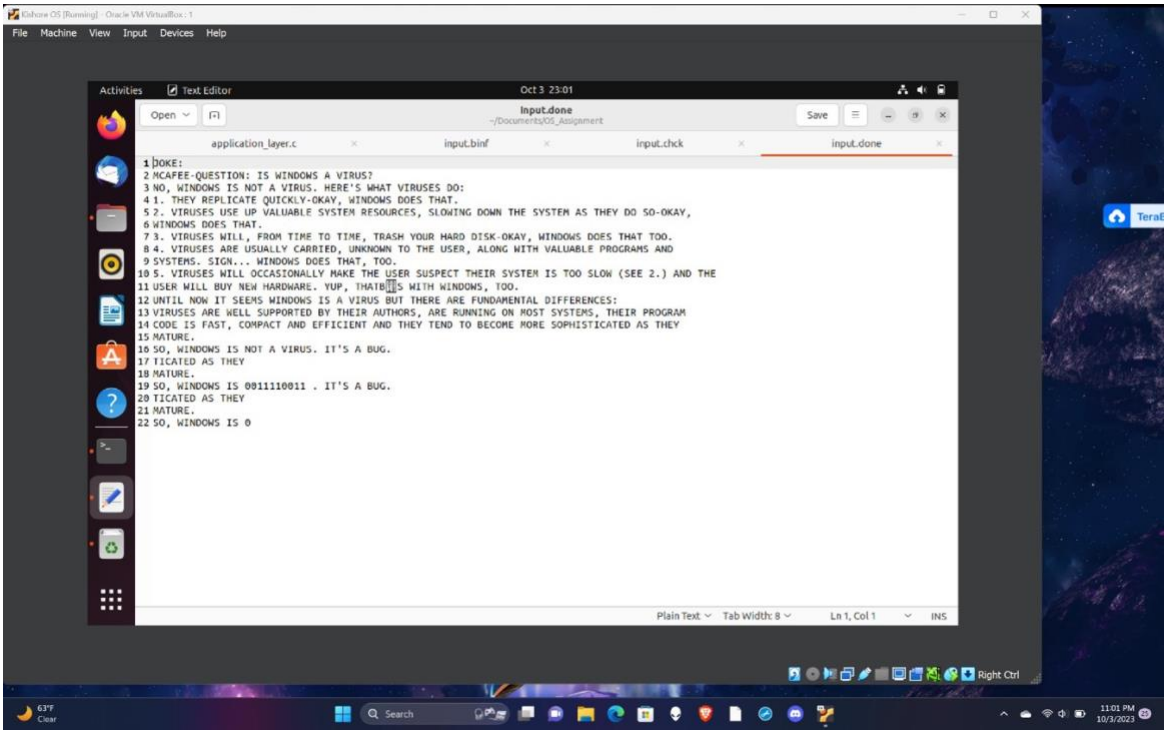
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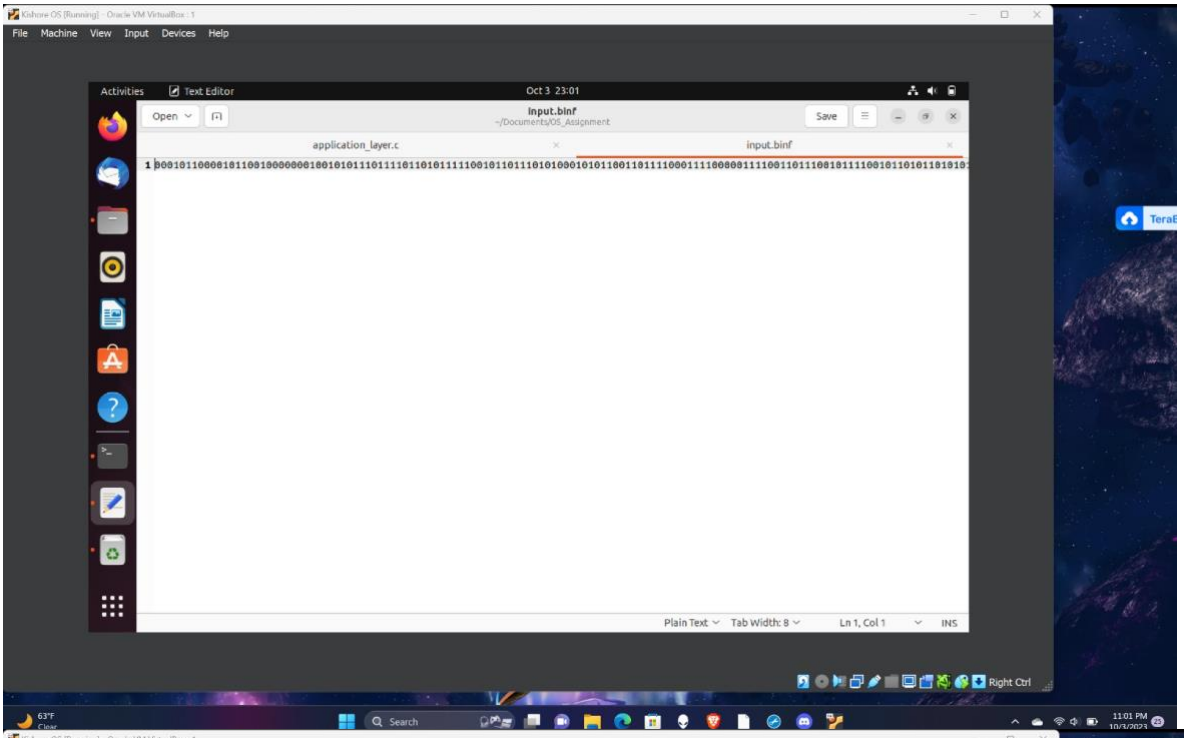
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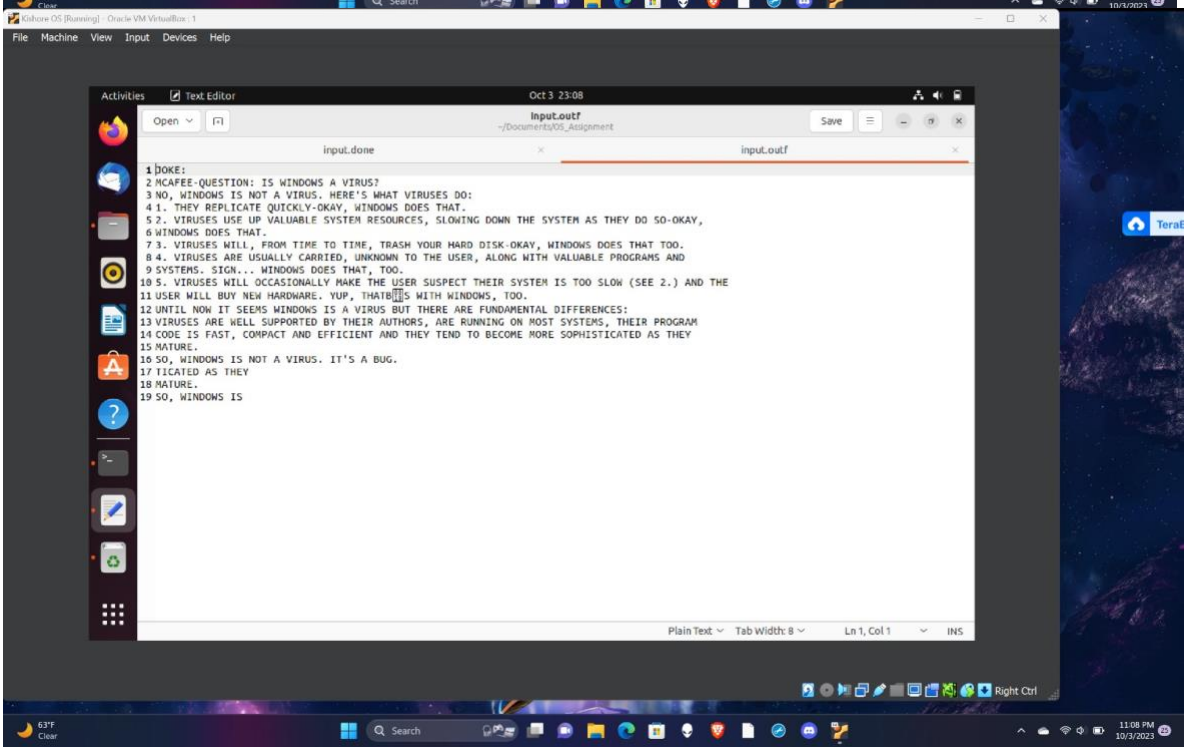
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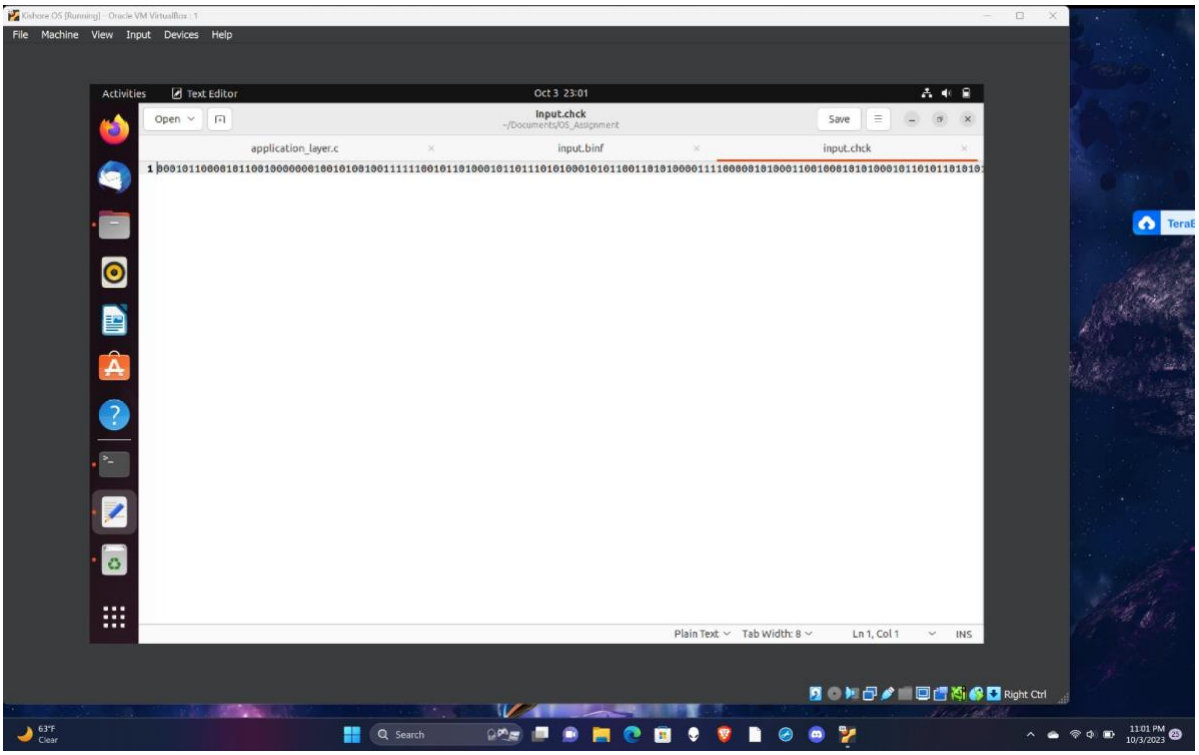
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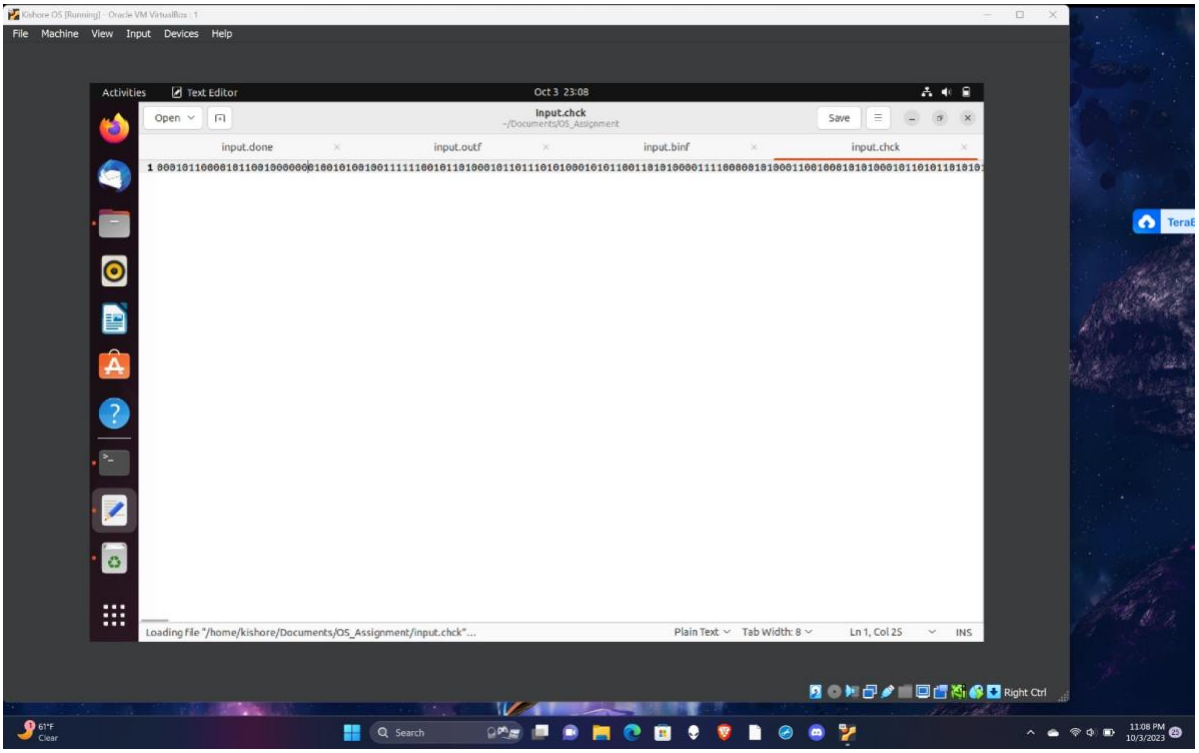
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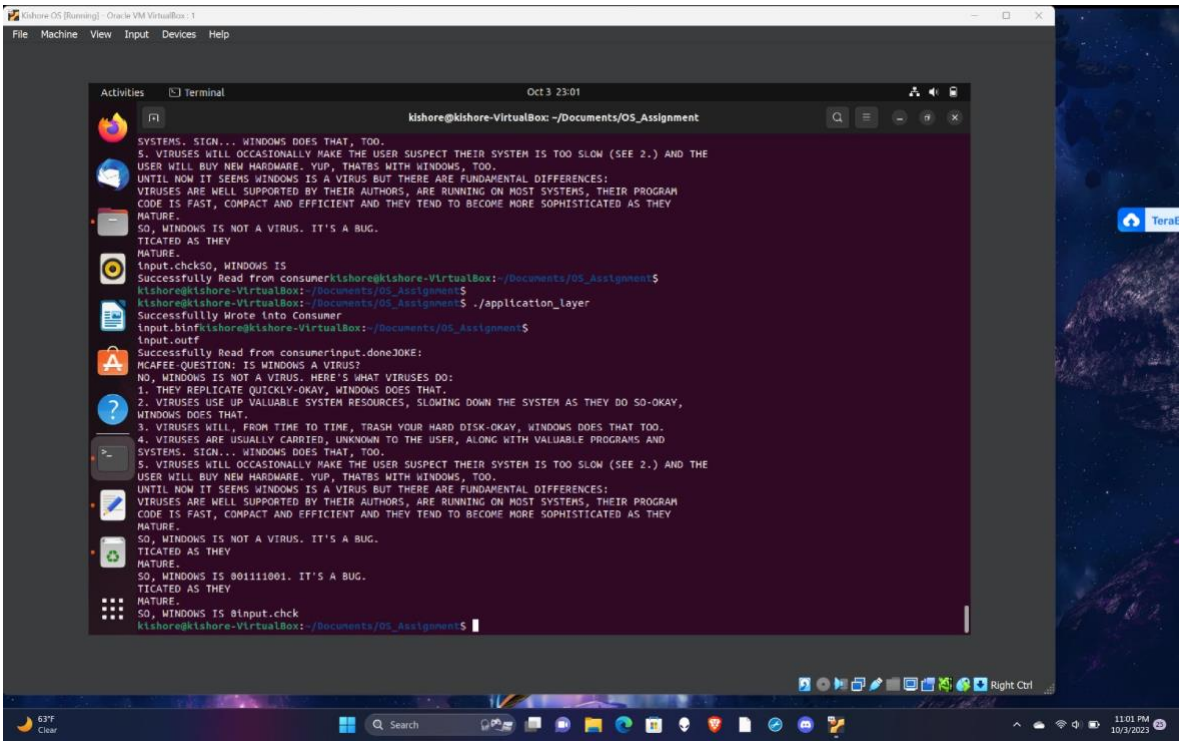
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kishore@kishore-VirtualBox:~/Documents/OS_Assignment$
kishore@kishore-VirtualBox:~/Documents/OS_Assignment$ ./application_layer
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input.binfkishore@kishore-VirtualBox:~/Documents/OS_Assignment$
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