

ITSC205: Operating Systems Internals

Lab QUIZ #2

ITSC205: Operating Systems Internals

**NAME:\_\_\_Coleton Sanheim\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Mark:\_\_\_\_\_\_/40**

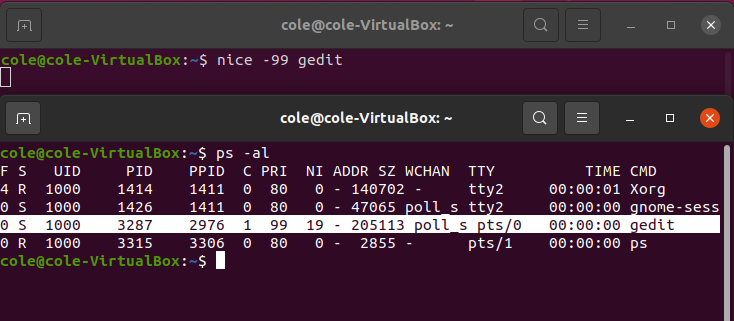
***Attach respective screen captures to demo results. You are allowed to use virtual machines******and labs.***

*“Academic dishonesty in any fashion is a serious offence.  Anyone caught cheating will be dealt with according to SAIT’s academic policy and procedure, Student Code of Conduct AC 3.4 and AC 3.4.1, and as has been detailed in the ETHI 110 Academic Honesty Awareness Tutorial.”*

**Linux Operating System**  **\_\_\_\_/20**

1. ( 3 marks) Attach screen captures that demo the following:

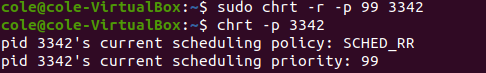
1. Creation of a Linux process with the lowest priority of 99



1. Display the process’ scheduling policy



1. Modify current scheduler policy to SCHED-RR (Round Robin Policy)



3. (4 marks) Which Linux commands will perform the following?

1. Display current mounted file systems and its features such as: file system type and permissions

**mount**

1. Display Files/Directories inode

**ls -i**

1. Display Files’ timestamps ( access, modify and change time)

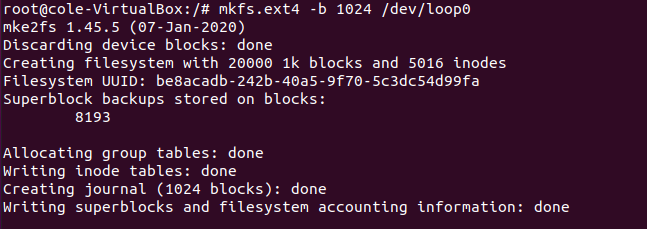
**stat <filename>**

1. Creates a hard link

**ln <source> <hard link>**

4. (8 marks) Use the 20MB file created in Lab 7 to create an ext4 file system with blocks size 1024 in any available loop device and attach screen captures that displays:

1. Creation of ext4 file system on loop device



1. File system ext4 mounted on /mnt directory



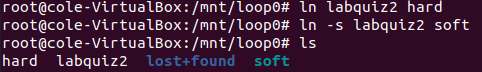
1. Display mounted ext4 file system usage



1. Creation of a file called labquiz2 on this file system



1. Creation of a file’s soft and hard link in this ext4 file system



1. Display the inodes of the original file and the respective soft link



2. ( 5 marks ) Create a POSIX thread that runs the following function:

void \*get\_character(void \*m)

{

    int c;

while( (c = getchar()) !=’Q’ )

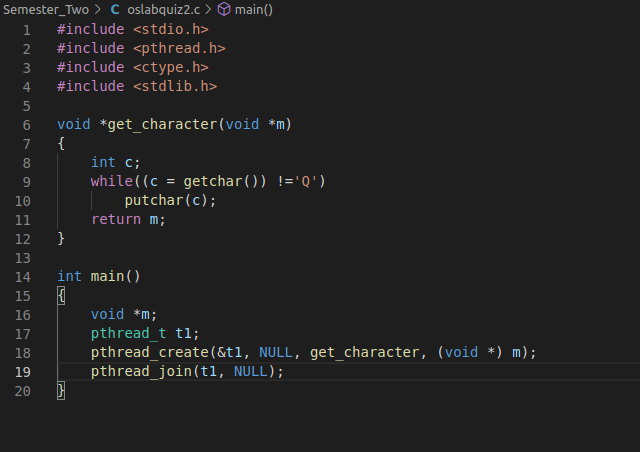
putchar(c);

return m;

}

Attach the screen with the code and the results after compiling and executing the thread.

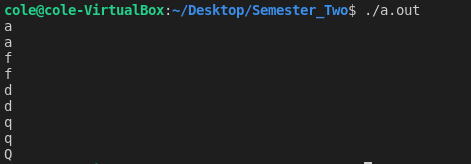
**Code:**



**Results after compiling:**

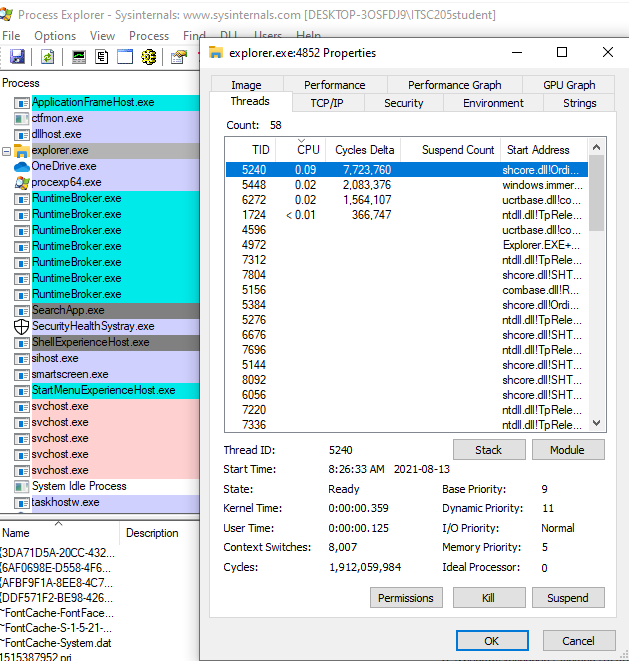


**Results after executing:**

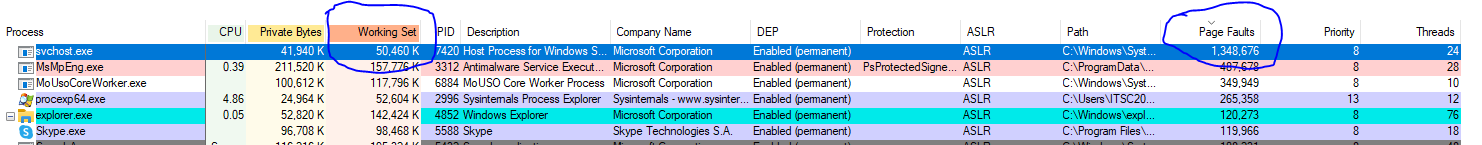


**Windows Operating System \_\_\_/20**

1. (3 marks ) Attach screen capture of System Internals tool that displays the threads used by **explorer** process. Display the threads state and priority



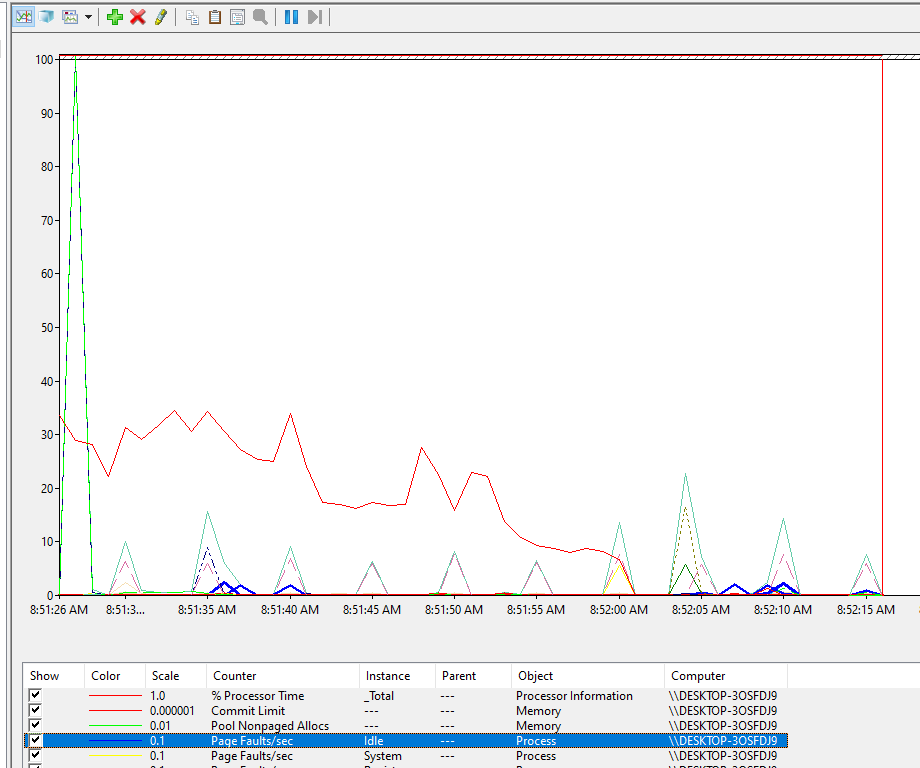
1. (3 marks) Attach screen capture of a Windows tool that displays
   1. Page faults and working set of the Windows process with the highest page faults.



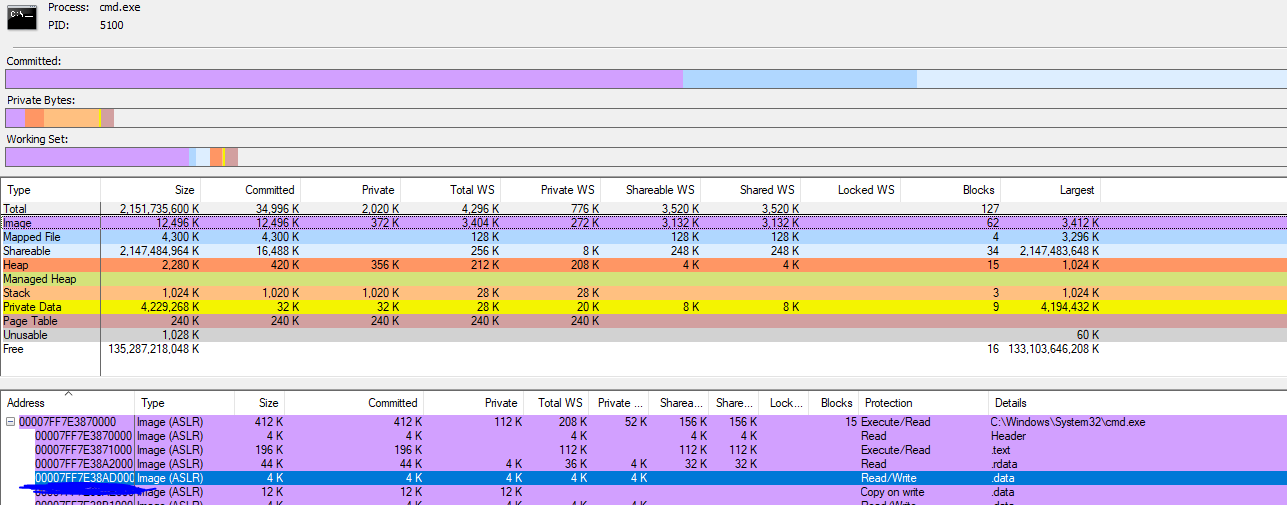
* 1. How many active pages are used by this process if each page is 4096 bytes (4K)?

**12616 active pages**

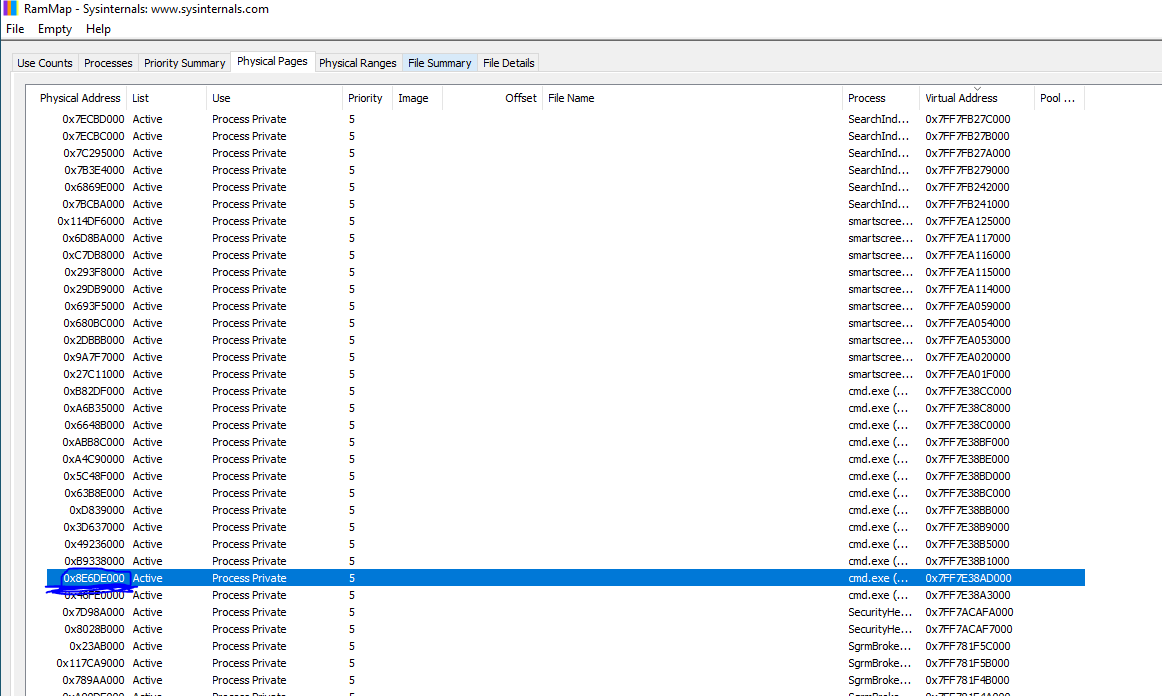
1. (3 marks) Attach screen capture of a Windows tool that displays Commit Limit, Pool Nonpaged Allocs and Page Faults/sec in the system.



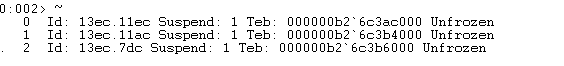
1. (8 marks) Attach screen captures to demo the following for **cmd** process:
   1. Use the respective System Internals tool to find the virtual based address of **.data** for **cmd** process (executable) in the **image** section. In the screen capture underline the address or record it here: **00007FF7E38AD000\_\_\_\_**



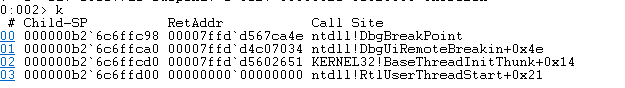
* 1. Use the respective System Internals tool to find the respective physical address of the founded virtual based address for .data recorded before in point a. In the screen capture underline the founded physical address



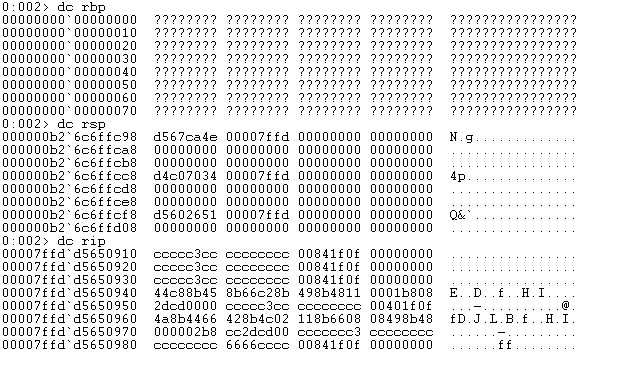
* 1. Use respective Windbg commands that displays for cmd process
     1. threads of this process



* + 1. stack of this process

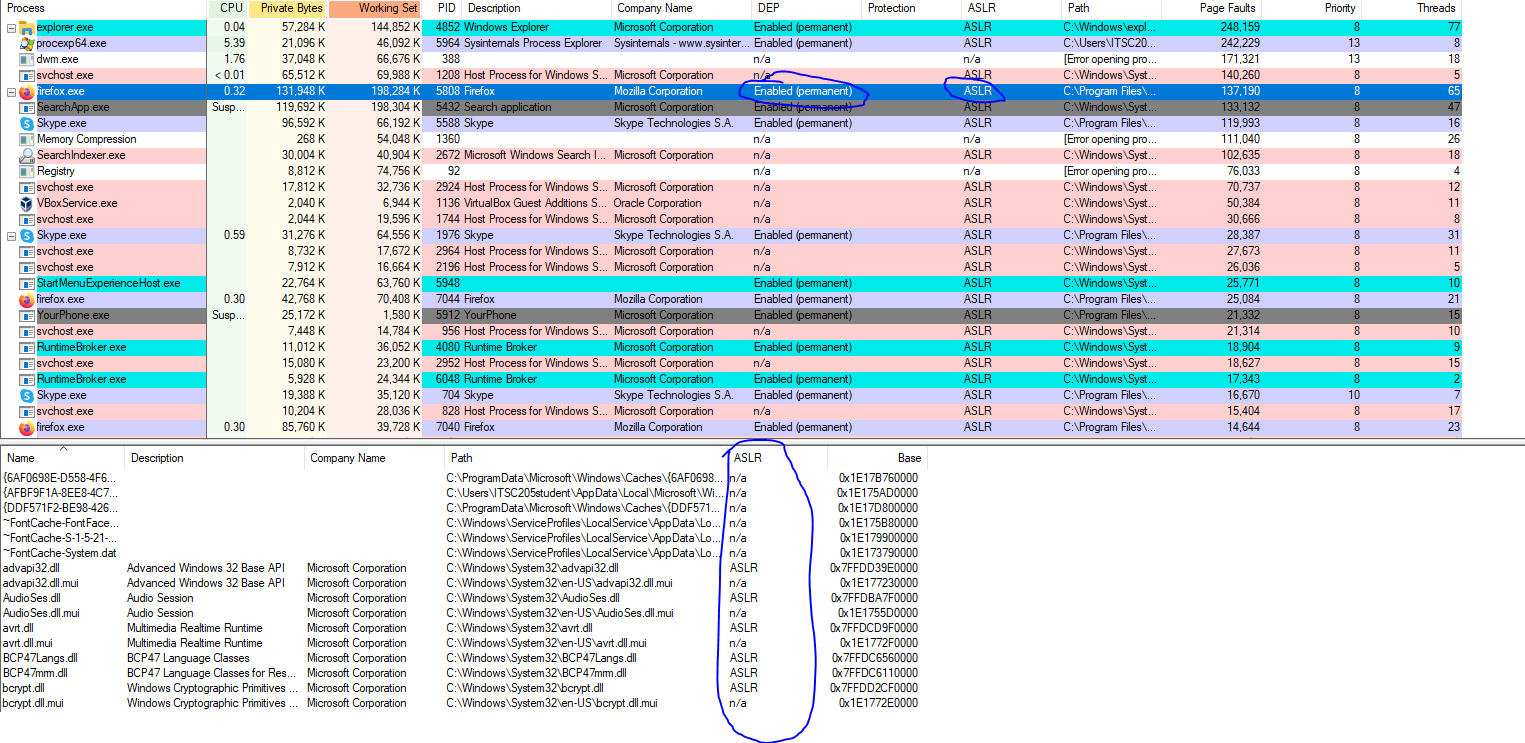


* + 1. the content of rbp , rsp and rip



* + 1. the content of the founded physical address in point b.



1. (3 marks) Use System Internals tool to display the DEP status of the browser process and verify if ASLR is enabled for the DLLs used by this process. Attach the screen that demo results