CMPE 283 ASSIGNMENT 1

Ayushman Mittal | SJSU ID: 013918515

**GITHUB REPO:** [**https://github.com/ayushman264/linux**](https://github.com/ayushman264/linux)

Steps/Commands followed for the assignment:

1. Installed ubuntu on VMWare fusion and booted the machine.
2. Installed git using command sudo apt install git
3. Forked the repo (mlarkin2015/linux)
4. Cloned the forked repo to local machine
5. Created new directory.
6. Modified the code given by professor and added both code and makefile to the directory.
7. sudo apt-get update
8. sudo apt-get install build-essential fakeroot libssl-dev libncurses5-dev kernel-package bc flex
9. cp /boot/config-$(uname -r) .config
10. make menuconfig
11. sudo make -j 6 && sudo make modules\_install -j 6 && sudo make install -j 6
12. Reboot the machine for changes to apply, check using uname -r
13. make clean
14. make all
15. sudo insmod cmpe283-1.ko
16. dmesg
17. Got the expected output.
18. Git add –all
19. Git push

Output:

[  504.561276] CMPE 283 Assignment 1 Module Start  
[  504.561280] Pinbased Controls MSR: 0x3f00000016  
[  504.561281]   External-interrupt exiting: Can set=Yes, Can clear=Yes  
[  504.561282]   NMI exiting: Can set=Yes, Can clear=Yes  
[  504.561283]   Virtual NMIs: Can set=Yes, Can clear=Yes  
[  504.561284]   Activate VMX preemption timer: Can set=No, Can clear=Yes  
[  504.561285]   Process posted interrupts: Can set=No, Can clear=Yes  
[  504.561286]   
               Procbased Controls MSR: 0xfff9fffe0401e172  
[  504.561287]   Interrupt-window exiting: Can set=Yes, Can clear=Yes  
[  504.561288]   Use TSC offsetting: Can set=Yes, Can clear=Yes  
[  504.561288]   HLT exiting: Can set=Yes, Can clear=Yes  
[  504.561289]   INVLPG exiting: Can set=Yes, Can clear=Yes  
[  504.561289]   MWAIT exiting: Can set=Yes, Can clear=Yes  
[  504.561290]   RDPMC exiting: Can set=Yes, Can clear=Yes  
[  504.561290]   RDTSC exiting: Can set=Yes, Can clear=Yes  
[  504.561291]   CR3-load exiting: Can set=Yes, Can clear=No  
[  504.561292]   CR3-store exiting: Can set=Yes, Can clear=No  
[  504.561292]   CR8-load exiting: Can set=Yes, Can clear=Yes  
[  504.561293]   CR8-store exiting: Can set=Yes, Can clear=Yes  
[  504.561294]   Use TPR shadow: Can set=Yes, Can clear=Yes  
[  504.561294]   NMI-window exiting: Can set=Yes, Can clear=Yes  
[  504.561295]   MOV-DR exiting: Can set=Yes, Can clear=Yes  
[  504.561295]   Unconditional I/O exiting: Can set=Yes, Can clear=Yes  
[  504.561296]   Use I/O bitmaps: Can set=Yes, Can clear=Yes  
[  504.561296]   Monitor trap flag: Can set=Yes, Can clear=Yes  
[  504.561297]   Use MSR bitmaps: Can set=Yes, Can clear=Yes  
[  504.561298]   MONITOR exiting: Can set=Yes, Can clear=Yes  
[  504.561298]   PAUSE exiting: Can set=Yes, Can clear=Yes  
[  504.561299]   Activate secondary controls: Can set=Yes, Can clear=Yes  
[  504.561300]   
               Secondary Procbased Controls MSR: 0x553cfe00000000   
[  504.561301]   Virtualize APIC accesses: Can set=No, Can clear=Yes  
[  504.561302]   Enable EPT: Can set=Yes, Can clear=Yes  
[  504.561302]   Descriptor-table exiting: Can set=Yes, Can clear=Yes  
[  504.561303]   Enable RDTSCP: Can set=Yes, Can clear=Yes  
[  504.561303]   Virtualize x2APIC mode: Can set=Yes, Can clear=Yes  
[  504.561304]   Enable VPID: Can set=Yes, Can clear=Yes  
[  504.561304]   WBINVD exiting: Can set=Yes, Can clear=Yes  
[  504.561305]   Unrestricted guest: Can set=Yes, Can clear=Yes  
[  504.561306]   APIC-register virtualization: Can set=No, Can clear=Yes  
[  504.561307]   Virtual-interrupt delivery: Can set=No, Can clear=Yes  
[  504.561307]   PAUSE-loop exiting: Can set=Yes, Can clear=Yes  
[  504.561308]   RDRAND exiting: Can set=Yes, Can clear=Yes  
[  504.561308]   Enable INVPCID: Can set=Yes, Can clear=Yes  
[  504.561309]   Enable VM functions: Can set=Yes, Can clear=Yes  
[  504.561309]   VMCS shadowing: Can set=No, Can clear=Yes  
[  504.561310]   Enable ENCLS exiting: Can set=No, Can clear=Yes  
[  504.561311]   RDSEED exiting: Can set=Yes, Can clear=Yes  
[  504.561311]   Enable PML: Can set=No, Can clear=Yes  
[  504.561312]   EPT-violation #VE: Can set=Yes, Can clear=Yes  
[  504.561313]   Conceal VMX non-root operation from Intel PT: Can set=No, Can clear=Yes  
[  504.561313]   Enable XSAVES/XRSTORS: Can set=Yes, Can clear=Yes  
[  504.561314]   Mode-based execute control for EPT: Can set=Yes, Can clear=Yes  
[  504.561315]   Sub-page write permissions for EPT: Can set=No, Can clear=Yes  
[  504.561315]   Intel PT uses guest physical addresses: Can set=No, Can clear=Yes  
[  504.561316]   Use TSC scaling: Can set=No, Can clear=Yes  
[  504.561316]   Enable user wait and pause: Can set=No, Can clear=Yes  
[  504.561317]   Enable ENCLV exiting: Can set=No, Can clear=Yes  
[  504.561318]   
               VMX Exit Controls MSR: 0xbfffff00036dff  
[  504.561319]   Save debug controls: Can set=Yes, Can clear=No  
[  504.561319]   Host address-space size: Can set=Yes, Can clear=Yes  
[  504.561320]   Load IA32\_PERF\_GLOB AL\_CTRL: Can set=Yes, Can clear=Yes  
[  504.561321]   Acknowledge interrupt on exit: Can set=Yes, Can clear=Yes  
[  504.561321]   Save IA32\_PAT: Can set=Yes, Can clear=Yes  
[  504.561322]   Load IA32\_PAT: Can set=Yes, Can clear=Yes  
[  504.561322]   Save IA32\_EFER: Can set=Yes, Can clear=Yes  
[  504.561323]   Load IA32\_EFER: Can set=Yes, Can clear=Yes  
[  504.561323]   Save VMX-preemption timer value: Can set=No, Can clear=Yes  
[  504.561324]   Clear IA32\_BNDCFGS: Can set=Yes, Can clear=Yes  
[  504.561324]   Conceal VMX from PT: Can set=No, Can clear=Yes  
[  504.561325]   Clear IA32\_RTIT\_CTL: Can set=No, Can clear=Yes  
[  504.561326]   Load CET state: Can set=No, Can clear=Yes  
[  504.561327]   
               VMX Entry Controls MSR: 0x1f3ff000011ff  
[  504.561327]   Load debug controls: Can set=Yes, Can clear=No  
[  504.561328]   IA-32e mode guest: Can set=Yes, Can clear=Yes  
[  504.561328]   Entry to SMM: Can set=No, Can clear=Yes  
[  504.561329]   Deactivate dual-monitor treatment: Can set=No, Can clear=Yes  
[  504.561330]   Load IA32\_PERF\_GLOBAL\_CTRL: Can set=Yes, Can clear=Yes  
[  504.561330]   Load IA32\_PAT: Can set=Yes, Can clear=Yes  
[  504.561331]   Load IA32\_EFER: Can set=Yes, Can clear=Yes  
[  504.561331]   Load IA32\_BNDCFGS: Can set=Yes, Can clear=Yes  
[  504.561332]   Conceal VMX from PT: Can set=No, Can clear=Yes  
[  504.561333]   Load IA32\_RTIT\_CTL: Can set=No, Can clear=Yes  
[  504.561333]   Load CET state: Can set=No, Can clear=Yes

[  504.561496] CMPE 283 Assignment 1 Module Exits