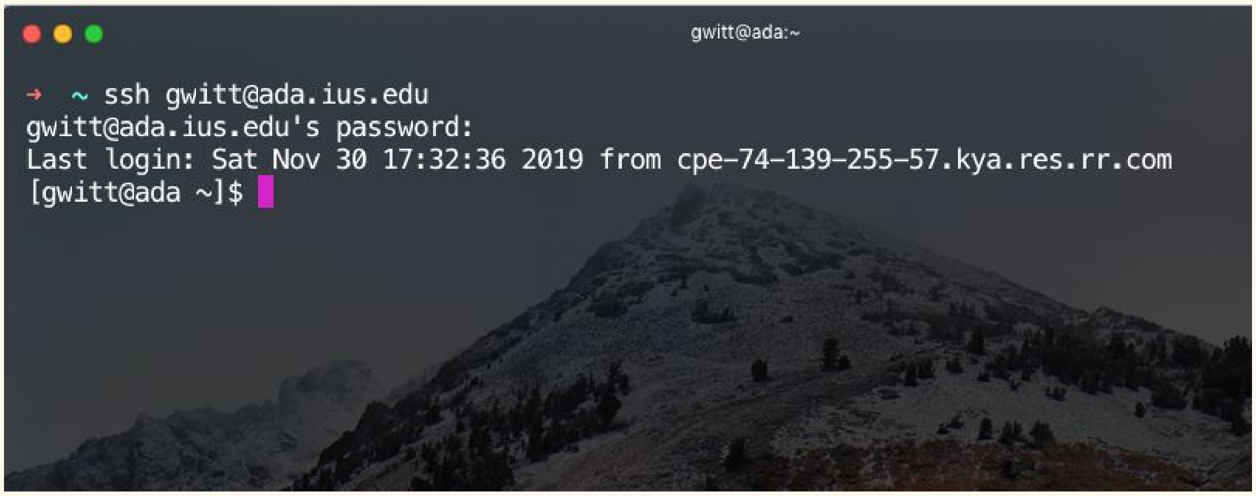
Greg Witt
Computer Structures

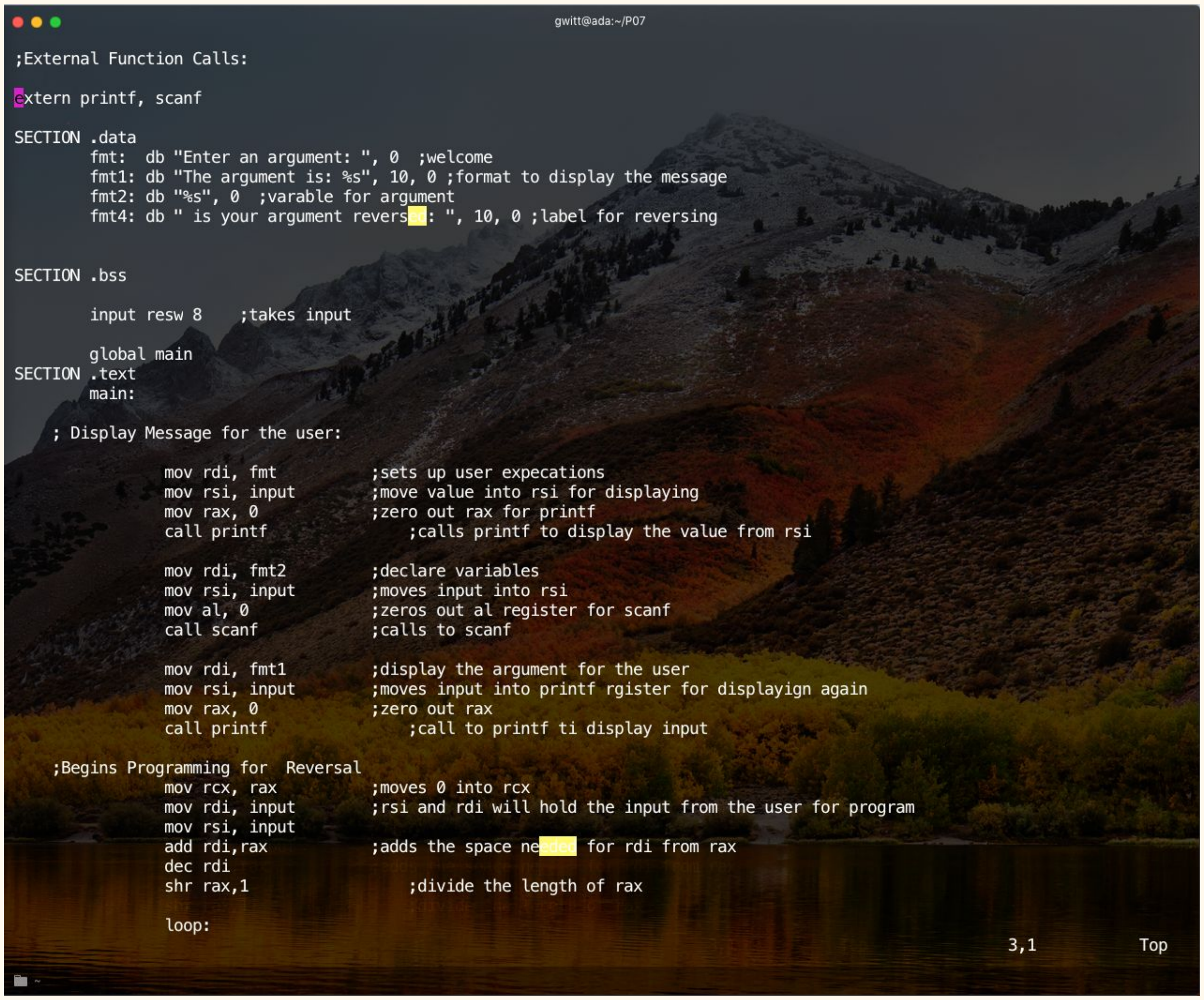
P-07

Login to ADA Via SSH

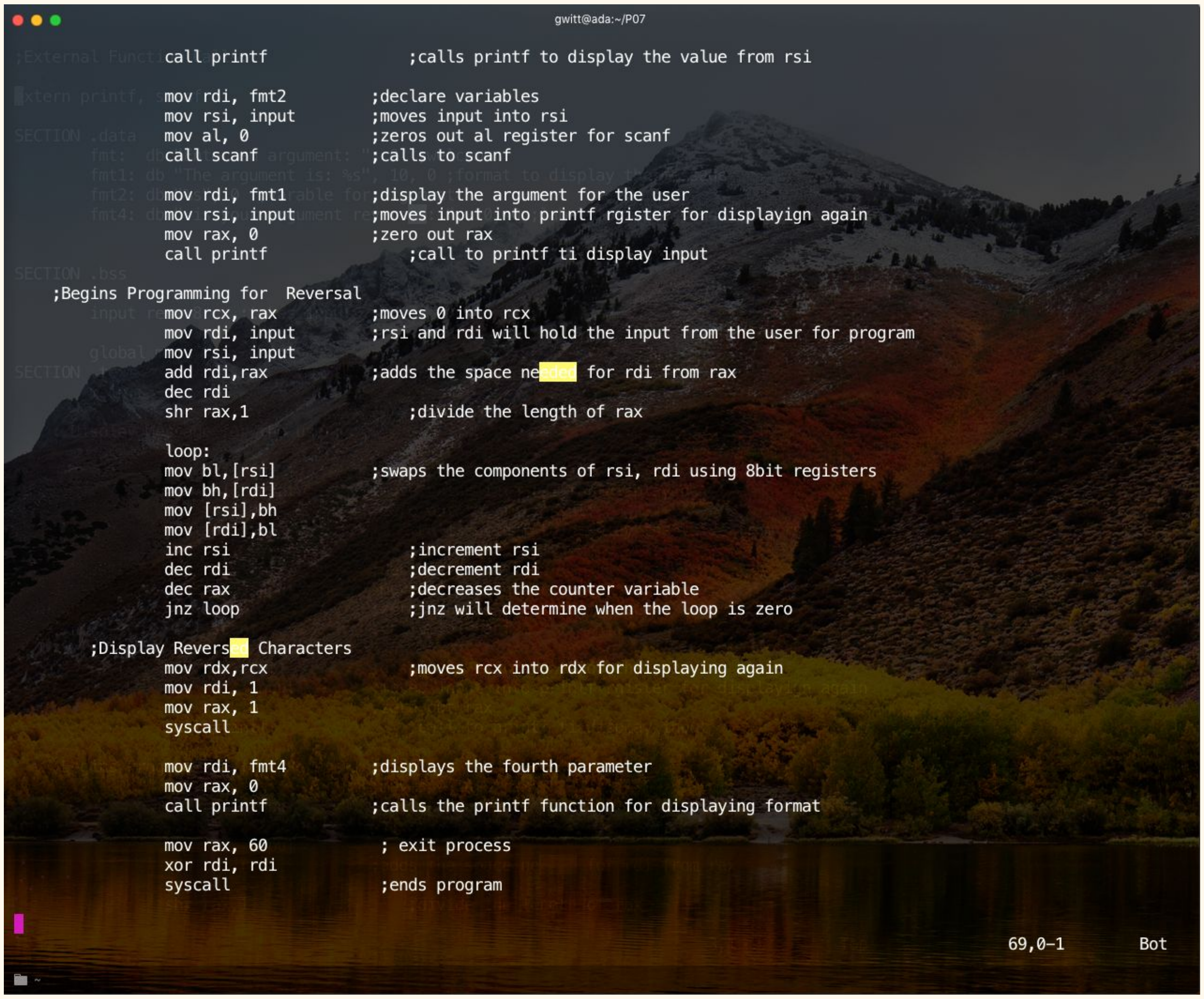


```
➜  ~ ssh gwitt@ada.ius.edu
gwitt@ada.ius.edu's password:
Last login: Sat Nov 30 17:32:36 2019 from cpe-74-139-255-57.kya.res.rr.com
[gwitt@ada ~]$ 
```

Code Execution with VIM

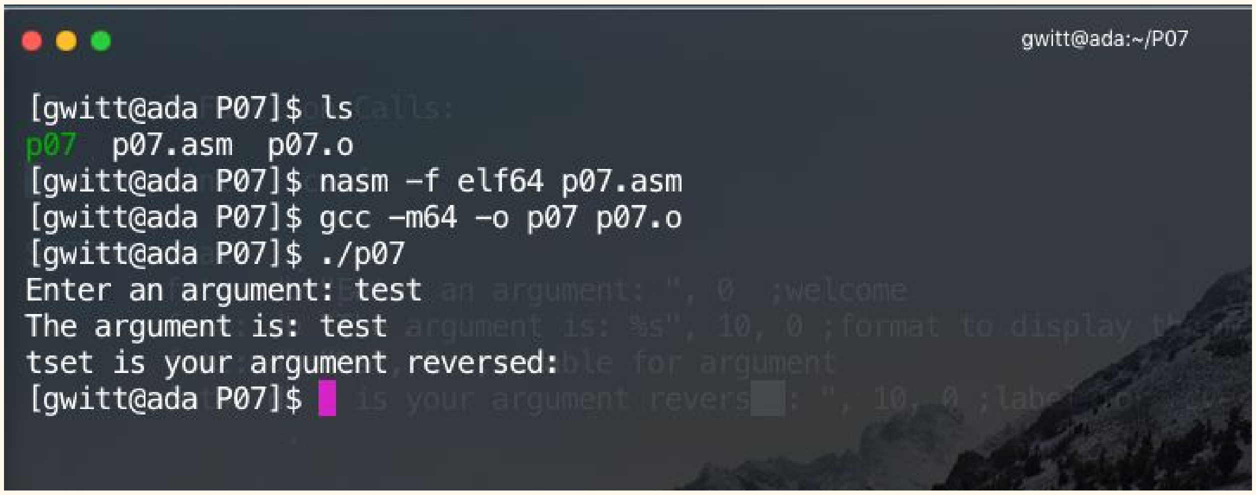

gwitt@ada:~/P07

```
;External Function Calls:

extern printf, scanf

SECTION .data
        fmt:  db "Enter an argument: ", 0  ;welcome
        fmt1: db "The argument is: %s", 10, 0 ;format to display the message
        fmt2: db "%s", 0  ;varable for argument
        fmt4: db " is your argument reversed: ", 10, 0 ;label for reversing


SECTION .bss

        input resw 8    ;takes input

        global main
SECTION .text
        main:

    ; Display Message for the user:

                mov rdi, fmt            ;sets up user expecations
                mov rsi, input          ;move value into rsi for displaying
                mov rax, 0              ;zero out rax for printf
                call printf                 ;calls printf to display the value from rsi

                mov rdi, fmt2           ;declare variables
                mov rsi, input          ;moves input into rsi
                mov al, 0               ;zeros out al register for scanf
                call scanf              ;calls to scanf

                mov rdi, fmt1           ;display the argument for the user
                mov rsi, input          ;moves input into printf rgister for displayign again
                mov rax, 0              ;zero out rax
                call printf                 ;call to printf ti display input

    ;Begins Programming for  Reversal
                mov rcx, rax            ;moves 0 into rcx
                mov rdi, input          ;rsi and rdi will hold the input from the user for program
                mov rsi, input
                add rdi,rax             ;adds the space needed for rdi from rax
                dec rdi
                shr rax,1                   ;divide the length of rax

                loop:
                                                                              3,1           Top
```



```
                call printf                 ;calls printf to display the value from rsi

                mov rdi, fmt2           ;declare variables
                mov rsi, input          ;moves input into rsi
                mov al, 0               ;zeros out al register for scanf
                call scanf              ;calls to scanf

                mov rdi, fmt1           ;display the argument for the user
                mov rsi, input          ;moves input into printf rgister for displayign again
                mov rax, 0              ;zero out rax
                call printf                 ;call to printf ti display input

    ;Begins Programming for  Reversal
                mov rcx, rax            ;moves 0 into rcx
                mov rdi, input          ;rsi and rdi will hold the input from the user for program
                mov rsi, input
                add rdi,rax             ;adds the space needed for rdi from rax
                dec rdi
                shr rax,1                   ;divide the length of rax

                loop:
                mov bl,[rsi]            ;swaps the components of rsi, rdi using 8bit registers
                mov bh,[rdi]
                mov [rsi],bh
                mov [rdi],bl
                inc rsi                     ;increment rsi
                dec rdi                     ;decrement rdi
                dec rax                     ;decreases the counter variable
                jnz loop                    ;jnz will determine when the loop is zero

        ;Display Reversed Characters
                mov rdx,rcx                 ;moves rcx into rdx for displaying again
                mov rdi, 1
                mov rax, 1
                syscall

                mov rdi, fmt4           ;displays the fourth parameter
                mov rax, 0
                call printf             ;calls the printf function for displaying format

                mov rax, 60              ; exit process
                xor rdi, rdi
                syscall                  ;ends program

                                                                                69,0-1        Bot
```

Compile Code via Command Line



gwitt@ada:~/P07

```
[gwitt@ada P07]$ ls
p07  p07.asm  p07.o
[gwitt@ada P07]$ nasm -f elf64 p07.asm
[gwitt@ada P07]$ gcc -m64 -o p07 p07.o
[gwitt@ada P07]$ ./p07
Enter an argument: test
The argument is: test
tset is your argument reversed:
[gwitt@ada P07]$
```