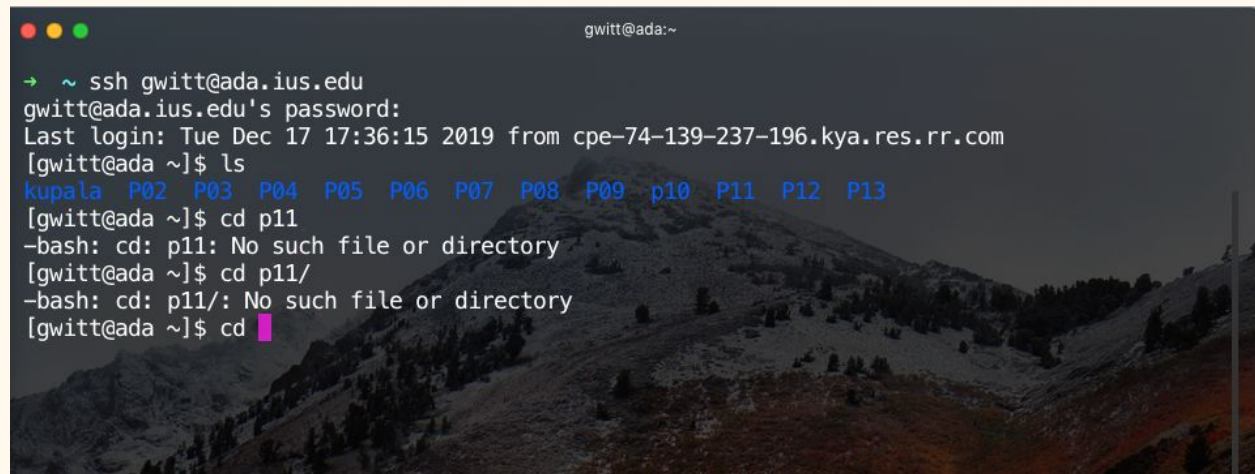


**Computer Structures**  
Greg Witt

# P-11

## Login to ADA Via SSH

A terminal window with a dark background and a mountain landscape wallpaper. The terminal shows the following commands and output:

```
→ ~ ssh gwitt@ada.ius.edu
gwitt@ada.ius.edu's password:
Last login: Tue Dec 17 17:36:15 2019 from cpe-74-139-237-196.kya.res.rr.com
[gwitt@ada ~]$ ls
kupala  P02  P03  P04  P05  P06  P07  P08  P09  p10  P11  P12  P13
[gwitt@ada ~]$ cd p11
-bash: cd: p11: No such file or directory
[gwitt@ada ~]$ cd p11/
-bash: cd: p11/: No such file or directory
[gwitt@ada ~]$ cd
```

## Code Execution With VIM

```

gwitt@ada:~/P11
; DEPENDENCIES:
; ensure include file is in directory of the project
;
; BUILD:
; nasm -f elf64 p11.asm
; gcc -m64 -o p11 p11.o
;
; EXAMPLE OUTPUT:
;
extern atoi, printf

SECTION .data
    fmt: db "%d, %d, and %d are True Pythagorean", 10, 0
    fmt2: db "%d, %d, and %d are NOT Pythagorean values", 10, 0

%macro get_ints 2
    ;;;;;;;;;;;
    mov rax, %1
    mov rdi, rax
    ;;;;;;;;;;; call to write to files:
    call atoi
    mov [%2], rax
%endmacro

SECTION .bss
    NUM1 resq 1
    NUM2 resq 1
    NUM3 resq 1

    global main
SECTION .text
    main:

    mov rbp, rsi

    ;;;;;;;;;;;
    ;; Call to Macro
    ;;;;;;;;;;;

    get_ints [rbp+8], NUM1
    get_ints [rbp+16], NUM2
    get_ints [rbp+24], NUM3

    ;;;;;;;;;;;
    ;; Adds Numbers into accumulator registers:
    "p11.nasm" 88L, 1489C

```

gwitt@ada:~/P11

```
;;;;;;;;;;;;;;  
;; Adds Numbers into accumulator registers:  
;;;;;;;;;;;;;;  
    mov r12, [NUM1]  
    imul r12, [NUM1]  
    mov r13, [NUM2]  
    imul r13, [NUM2]  
    mov r14, [NUM3]  
    imul r14, [NUM3]
```

```
;;;;; Begin Number Comparing ;;;;;;  
add r13, r12  
;;Compare Contents:  
cmp r13, r14  
je valid
```

```
;;;;; NOT VALID  
notvalid:
```

```
    mov rdi, fmt2  
    mov rsi, [NUM1]  
    mov rdx, [NUM2]  
    mov rcx, [NUM3]  
    mov rax, 0  
    call printf  
    jmp end
```

```
;;;;; VALID TRIPLET:  
valid:
```

```
    mov rdi, fmt  
    mov rsi, [NUM1]  
    mov rdx, [NUM2]  
    mov rcx, [NUM3]  
    mov rax, 0  
    call printf  
    jmp end
```

```
;;;;;;;;;;;;;;  
end:
```

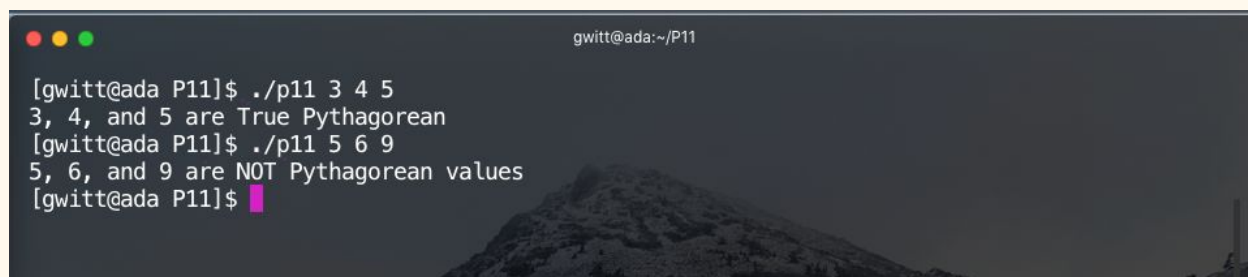
```
    mov rax, 60  
    xor rdi, rdi  
    syscall
```

87,9

97%



## Compiled Code via Commands Listed Terminated SSH Connection

A terminal window with a dark background and a mountain landscape wallpaper. The window title is 'gwitt@ada:~/P11'. The terminal shows the execution of a program named 'p11'. The first command is './p11 3 4 5', which outputs '3, 4, and 5 are True Pythagorean'. The second command is './p11 5 6 9', which outputs '5, 6, and 9 are NOT Pythagorean values'. The prompt '[gwitt@ada P11]\$' is followed by a pink cursor.

```
gwitt@ada:~/P11
[gwitt@ada P11]$ ./p11 3 4 5
3, 4, and 5 are True Pythagorean
[gwitt@ada P11]$ ./p11 5 6 9
5, 6, and 9 are NOT Pythagorean values
[gwitt@ada P11]$
```