```
[t168@linux4 ~/cmsc-313]$ cat translate2ascii.asm
; translate2ascii.asm
; Author: Nicholas Todd
; May 14, 2025
; translates input buffer data into ascii and prints to screen
; Assemble with: nasm -f elf32 translate2ascii.asm
; Link with:      ld -m elf_i386 -o translate2ascii translate2ascii.o

section .data
inputBuf:
    db 0x83,0x6A,0x88,0xDE,0x9A,0xC3,0x54,0x9A   ; input bytes, data to be translated
len equ $ - inputBuf                             ; compute length start - inputbuffer

section .bss
outputBuf:
    resb 80                  ; required buffer

section .text
global _start

_start:
    mov esi, inputBuf        ; set esi to read the inputBuf
    mov edi, outputBuf       ; set edi to write the outputBuf
    mov ecx, len             ; set ecx tothe calculated length

translate_loop:
```
```
    ; high nibble
    mov al, [esi]            ; al = value of the next byte
    mov ah, al               ; copy the byte
    shr ah, 4                ; ah = high 4 bits
    mov al, ah               ; al = nibble to translate
    call translate
    mov [edi], al            ; store ascii char
    inc edi

    ; low nibble
    mov al, [esi]            ; reload original byte
    and al, 0x0F             ; al = low 4 bits
    call translate
    mov [edi], al
    inc edi

    ; space
    mov byte [edi], ' '
    inc edi

    inc esi                  ; go to next
    loop translate_loop

    ; newline
    mov byte [edi], 0x0A
    inc edi
```

```
        ; write to output
        mov eax, 4              ; syscall for write
        mov ebx, 1              ; file descriptor stdout
        mov ecx, outputBuf      ; point to outputBuf
        mov edx, edi            ; end pointer
        sub edx, outputBuf      ; calculate length of output
        int 0x80

        ; exit block
        mov eax, 1              ; syscall for exit
        xor ebx, ebx
        int 0x80

; translate subroutine
translate:
        cmp al, 9
        jbe .is_digit
        add al, 0x37
        ret
.is_digit:
        add al, 0x30
        ret
```
[t168@linux4 ~/cmsc-313]$ nasm -f elf32 translate2ascii.asm
[t168@linux4 ~/cmsc-313]$ ld -m elf_i386 -o translate2ascii translate2ascii.o
[t168@linux4 ~/cmsc-313]$ translate2ascii
83 6A 88 DE 9A C3 54 9A