Practice Assembly program before Midterm Exam

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Fourth program Question is as follows.

Calculate the Factorial numbers between N1 and N2:

Write a program to write a factorial between N1 to N2 where the N1 and N2 are entered by the user. The program that uses a loop to calculate **the first N2- N1 values** of the Factorial number sequence, described by the following formula: Fact(1)=1 Fact(2)=1
Fact(3)=1*2*3=6
Store the result in the facarray and display the result.

N	1	2	3	4	5	6	7	8	9	10	11	
Fact(n)	1	1	6	24	120	720	5040	40320	362880	3628800		

```
.data
factarray dword  20 DUP(0)
count EQU (LENGTHOF dwarray)
```

```
; Chapter 4 Exercise 2 Given on Nov 2nd, 2017 Demonstration of writing in an array
; This program reads Nimul1 and N2, calculate the factorial of N1 to N2.
; This program uses to multiply each element for the factorial.
;-----------------------------------------------------------------

INCLUDE Irvine32.inc
TITLE Asm(first.asm)

.data
ODDARRAY DWORD 200 DUP(0)
Message1 BYTE "Please Enter an integer N1 and then N2: Now enter N1", 0dh, 0ah, 0
Message2 BYTE "Please Enter an integer N2", 0dh, 0ah, 0
Message3 BYTE  "The total amount of factorial between N1 to N2 that you input is as follows: ", 0dh, 0ah,
0
N1 DWORD ?
N2 DWORD ?
Total DWORD 1
```

```
.code
main PROC
mov edx, OFFSET Message1          ; Move the first message into the register
call writeString                   ; Write Message1 on to the screen
call ReadInt                       ; Read the first input n1 from the user
call Crlf                          ; display Newline
mov  N1, eax                       ; Move the value entered into n1
        ; Now here we try to read N2 using the message 2 and reading in from the user.
mov edx, OFFSET Message2          ; Move the first message into the register
call writeString                   ; Write Message1 on to the screen
call ReadInt                      ; Read the second input n2 from the user
call Crlf                         ; display Newline
mov  N2, eax                       ; Move the value entered into n2

         ; Now we calculate the N2 - N1 to run the loop.
mov eax, N2                        ; move n2 into eax
sub eax, N1                        ; subtract n1 to see how many to calculate
mov ecx, eax                       ; move n to ecx
inc ecx                           ; you need to have one extra
mov esi, 0                        ; first pointer to array
mov eax, N1                       ;  move  N1 into eax
```

```
; The following loop writes in an array the value.


L1:
mov ODDARRAY[esi], eax          ;  move each value into the array
inc eax                             ; increment N1 to the next element.
add esi, TYPE DWORD             ; increment the pointer
loop L1                             ; Loop next element

        ; I adjust the loop to run the second time.
mov eax, N2                     ; Move N2 into eax
sub eax, N1                     ; subtract the N1
mov ecx, eax                    ; Move eax into ecx
inc ecx                         ; Increment one element.
mov esi, 0                      ; move the pointer zero
mov eax, 1                      ; move just one into eax.
```

```
        ; The following loop reads from an array one by one.
        ; Then multiplies with the next element to create factorial for the  total

L2 :
mov ebx, ODDARRAY[esi]          ; Move the first element into eax
imul eax, ebx                    ; Multiply with the next element.
call writedec                    ; Print that element to the screen.
call crlf                        ; Move next line.
add esi, TYPE DWORD              ; Add pointer to esi
loop L2                          ; Loop again.

mov Total, eax
                          ;Get ready to print the result
mov edx, OFFSET Message3         ; Move the string offset
call writestring                 ; Write that string.
call crlf                        ;  Move the next line character.
mov eax, Total                   ; Move the total into eax
call writedec                    ; Write the total to the screen
call crlf                        ; Next line.
exit                             ; Exit gracefully.
main endp
end main
```

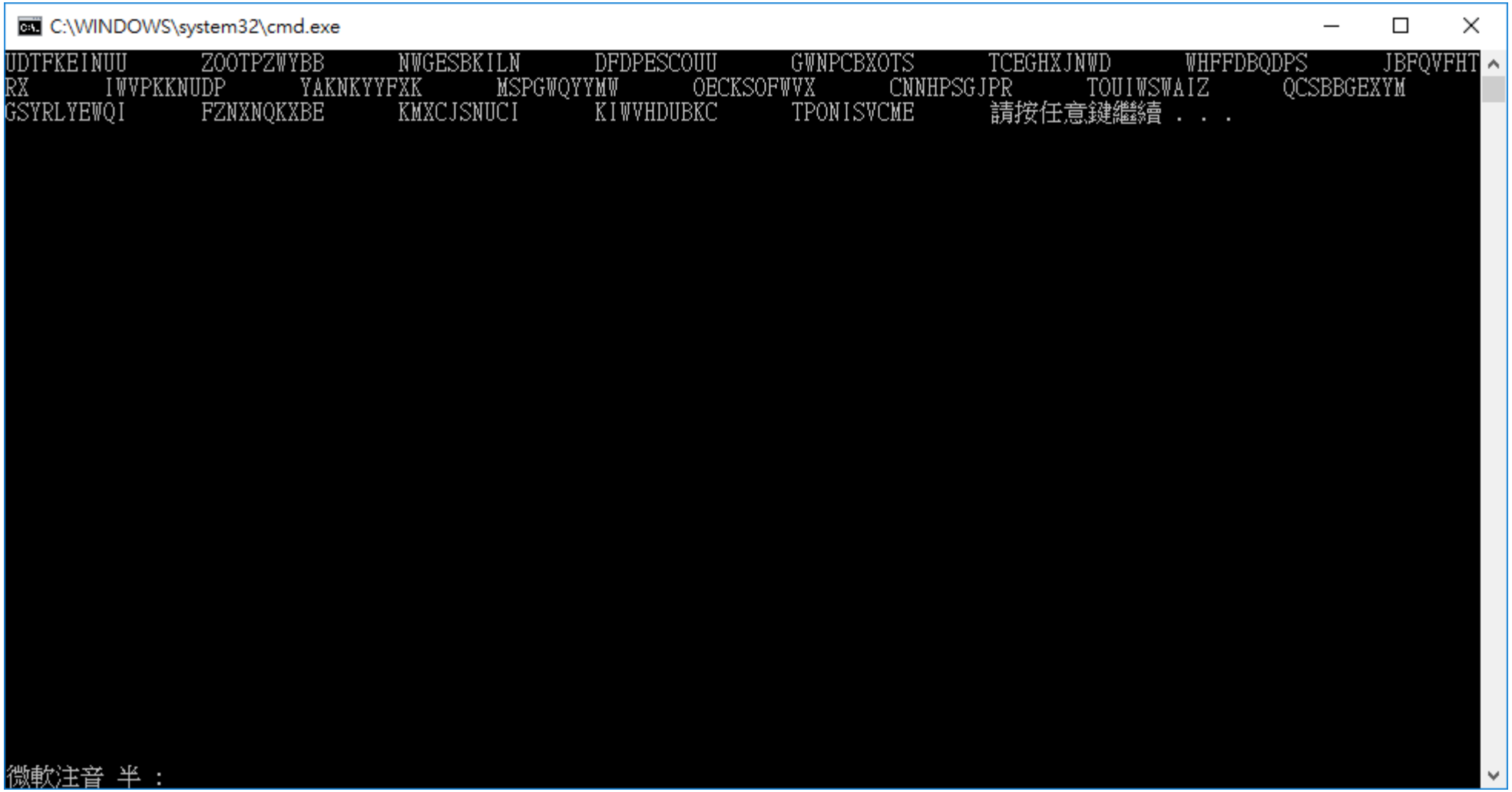
Second program Question is as follows.

Random Strings:

Create a procedure that generates a random string of length L, containing all capital letters. When calling the procedure, pass the value of L in EAX, and pass a pointer to an array of byte that will hold the random string.

Write a test program that calls your procedure 20 times and displays the strings in the console window.

SAMPLE output from the program



Fifth program Question is as follows.

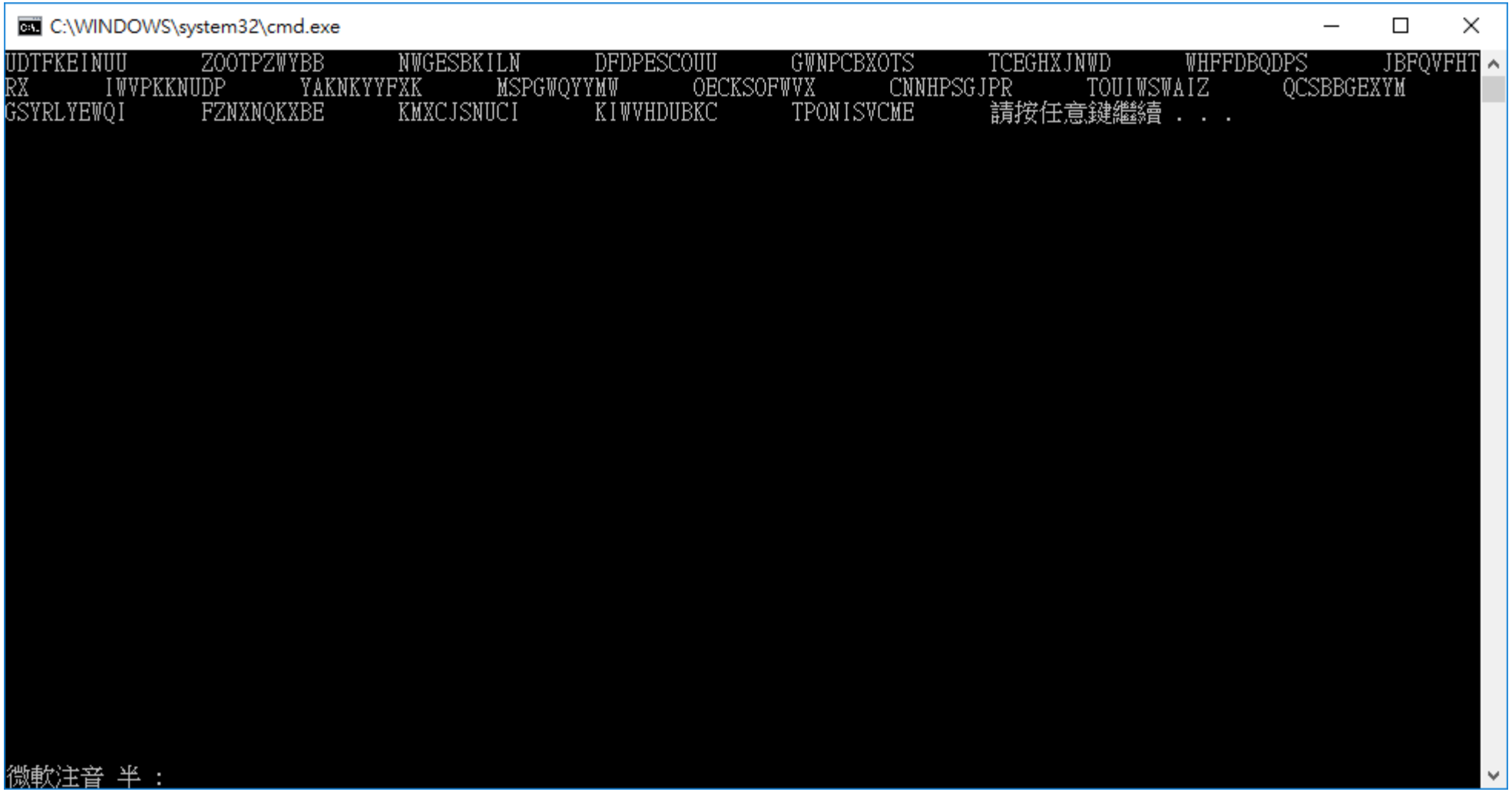
; Exercise 6: Random Strings
Comment !
Description : Create a procedure that generates a random string of length L, containing all capital letters. When calling the procedure, pass the value of L in EAX, and pass a pointer to an array of byte that will hold the random string.Write a test program that calls your procedure 20 times and displays the strings in the console window
!

```
INCLUDE Irvine32.inc

STR_COUNT = 20
STR_SIZE = 10
TAB = 9
.data
aString BYTE STR_SIZE DUP(0), 0
```

```
.code
main PROC
mov  ecx, STR_COUNT       ; loop count
call randomize
L1 :
; generate a single string
mov   eax, STR_SIZE; loop counter
mov   esi, OFFSET aString          ; string index
call  CreateRandomString

mov  edx, OFFSET aString          ; display the string
Call  WriteString
mov al, TAB                       ; after each string place a tab
call writechar
                                  ; callCrlf
loop  L1
exit
main ENDP
```

```
; ---------------------------------------- -
CreateRandomString PROC
; Creates a random string.  Receives: ESI points to the string,
; EAX contains the string size.  Returns:  nothing
; ---------------------------------------- -
push   ecx
mov   ecx, eax              ; get string size
L1 :
mov   eax, 26               ; generate random int(0..25)
call  RandomRange
add  eax, 'A‘               ; range: 'A'..'Z'
mov [esi], al               ; store the character
inc esi                     ; next character position
Loop L1                     ; Loop here.
pop  ecx
ret
CreateRandomString ENDP
END main
```

SAMPLE output from the program



END of our presentation