Name: KEY **Id#**

COE 205, Term 071

Computer Organization & Assembly Programming

Quiz# 3

Date: Saturday, Nov. 17, 2007

Q1. Suppose that you have the following initial content of registers and stack memory after fetching each of the instructions shown below:

EAX=00001F20H EBX=FFFFFC55H ESP=00001000H EIP=000030B0H

Determine the content of ESP, modified registers, and modified stack memory locations after the execution of each of the following instructions starting from the **initial content** of the registers and memory for the execution of each instruction.

Memory Location	Content
00000FFC	20
00000FFD	30
00000FFE	40
00000FFF	50
00001000	60
00001001	70
00001002	80

(i) PUSH EAX.

ESP = ESP – 4 = 1000 – 4 = 00000FFC
[FFFF:FFFC]=00001F20

(ii) POP BX.

BX=[1001:1000] = 7060
ESP = ESP + 2 = 1000 + 2 = 00001002

Q2. You are required to write a program to display a given **column** of a two-dimensional array of unsigned integers, TARRY. Assume that each integer is stored in a **double word**. To do that you need to do the following:

(i) Ask the user to enter the number of rows.

(ii) Ask the user to enter a column number.

(iii) In a new line, print the selected column.

Note that the procedure **WriteDec** can be used for displaying the content of EAX in unsigned decimal format to standard output. The procedure **WriteString** writes a null-terminated string whose address is stored in EDX to standard output. The procedure **WriteChar** writes the character in register AL to standard output. The procedure **Crlf** writes end of line sequence (CR, LF) to standard output. The procedure **ReadDec** reads a 32-bit unsigned integer and returns it in EAX. **You only need to show the data and code segments of the program.**

A sample execution of the program for the array given below is shown:

```
TARRAY   DWORD 1, 5, 300, 100, 5000
         DWORD 600, 0, 1110, 2000, 2
         DWORD 99, 16, 150, 530, 440
```

```
Enter the number of rows: 3
Enter a column number: 1
Column # 1
5
0
16
```

```
.DATA
MSG  BYTE "Enter the number of rows: ",0
MSG2 BYTE "Enter a column number: ",0
MSG3 Byte "Column#",0
TARRAY DWORD 1, 5, 300, 100, 5000
       DWORD 600, 0, 1110, 2000, 2
       DWORD 99, 16, 150, 530, 440

.CODE
main PROC

  MOV EDX, offset MSG
  Call WriteString
  Call ReadDec
  MOV ECX, EAX

  MOV EDX, offset MSG2
  Call WriteString
  Call ReadDec
  MOV EBX, EAX
  MOV EDX, offset MSG3
  Call WriteString
  Call WriteDec
  Call CRLF
Next:
  MOV EAX, TARRAY[EBX*Type TARRAY]
  Call WriteDec
  Call CRLF
  ADD EBX, lengthof TARRAY
  Loop Next

  main ENDP
  END main
```