組合語言與系統程式第一次小考考卷

姓名：　　學號：

1. (6%) How many bits do a word, doubleword, and quadword have, respectively?
   16, 32, 64

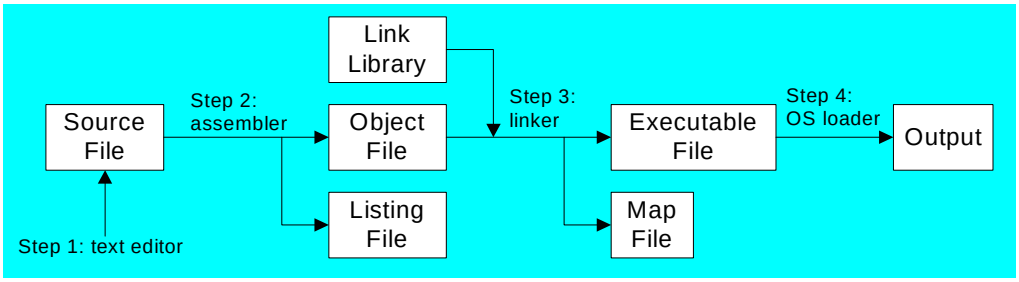
2. (8%) What are the ranges for an unsigned byte and a signed byte, respectively?
   0~255
   -128~+127

3. (9%) How many bits are registers, BX, DL, and EAX, respectively?
   16, 8, 32

4. (5%) Please describe the purpose of register EIP.
   Contains the address of the next instruction to be executed

5. (5%) Given a segment address 09F2:0100, please convert to a linear address.
   0A020

6. (15%) Please draw a diagram to describe the steps from creating an assembly source program through executing the compiled program and the intermediate files.



7. (10%) Given two initialized 32-bit unsigned variables and an uninitialized 32-bit unsigned variable, please complete the following program to compute the sum of the two variables and save the result in the uninitialized variable.

TITLE Add
INCLUDE Irvine32.inc
.data

```
val1 DWORD 10000h
val2 DWORD 40000h

finalVal DWORD ?
.code
main PROC
    mov eax,val1
    add eax,val2
    mov finalVal,eax
exit
main ENDP
END main
```

8. (28%) What are the contents of the specific registers and flags after the execution of the flowing instructions?

(A) (6%)

```
.data
arrayW    WORD 1000h,2000h,3000h
arrayD    DWORD 1,2,3,4
.code
mov ax,[arrayW+4]          ; AX = 3000h
mov eax,[arrayD+4]         ; EAX = 00000002h
```

(B) (12%)

```
mov ax,00FFh
add ax,1  ; AX= 0100h          SF= 0 ZF= 0 CF= 0
sub ax,1  ; AX= 00FFh          SF= 0 ZF= 0 CF= 0
add al,1  ; AL=   00h          SF= 0 ZF= 1 CF= 1
```

(C) (10%)

```
.data
myDouble DWORD 12345678h
.code
mov al,BYTE PTR    myDouble              ; AL = 78h
mov al,BYTE PTR [myDouble+1]             ; AL = 56h
mov al,BYTE PTR [myDouble+2]             ; AL = 34h
mov ax,WORD PTR    myDouble              ; AX = 5678h
mov ax,WORD PTR [myDouble+2]             ; AX = 1234h
```

9. (10%) Please describe the syntax and the logic of instruction LOOP.

LOOP target

ECX ← ECX – 1

if ECX != 0, jump to *target*

10. (4%) Please complete the following program of a nested loop.

```
.data
count DWORD ?
.code
      mov ecx,100
L1:
      mov count,ecx
      mov ecx,20
L2:   .
.
      loop L2
      mov ecx,count
      loop L1
```