7.9.2

2. Suppose the instruction set contained no rotate instructions. Show how you would use SHR and a conditional jump instruction to rotate the contents of the AL register 1 bit to the right.

shr al, 1 (shift right)  
jnc next  
or al, 80h  
next:

3. Write a logical shift instruction that multiplies the contents of EAX by 16.

shl eax, 4

5. Write a single rotate instruction that exchanges the high and low halves of the DL register.

ror dl, 4

6. Write a single SHLD instruction that shifts the highest bit of the AX register into the lowest bit position of DX and shifts DX one bit to the left.

shld dx, ax,1

12. Implement the following C++ expression in assembly language, using 32-bit signed operands:

val1 = (val2 / val3) \* (val1 + val2)

mov eax,val2  
mul val3  
mov ebx,val4  
sub ebx,3  
div ebx  
mov val1,eax

13. Write a procedure that displays an unsigned 8-bit binary value in decimal format. Pass the binary value in AL. The input range is limited to 0 to 99, decimal. The only procedure you can call from the book’s link library is WriteChar. The procedure should contain approximately eight instructions. Here is a sample call:

mov al,65 ; range limit: 0 to 99

call showDecimal8

main proc

mov al, 14h

call showDecimal

invoke ExitProcess,0

main endp

showDecimal PROC

PUSHAD

mov ah, 0

mov ebx, 0

mov ecx, 0

mov edx, 0

mov bl, 10d

DIVLOOP:

inc ecx

div bl

push eax

mov ah, 0

cmp al, 0

jne DIVLOOP

WRITELOOP:

pop eax

call writeDigit

LOOP WRITELOOP

POPAD

ret

showDecimal ENDP

writeDigit PROC

push eax

CMP0:

cmp ah, 0

jne CMP1

mov al, '0'

jmp DONE

CMP1:

cmp ah, 1

jne CMP2

mov al, '1'

jmp DONE

CMP2:

cmp ah, 2

jne CMP3

mov al, '2'

jmp DONE

CMP3:

cmp ah, 3

jne CMP4

mov al, '3'

jmp DONE

CMP4:

cmp ah, 4

jne CMP5

mov al, '4'

jmp DONE

CMP5:

cmp ah, 5

jne CMP6

mov al, '5'

jmp DONE

CMP6:

cmp ah, 6

jne CMP7

mov al, '6'

jmp DONE

CMP7:

cmp ah, 7

jne CMP8

mov al, '8'

jmp DONE

CMP8:

cmp ah, 8

jne CMP9

mov al, '9'

jmp DONE

CMP9:

cmp ah, 9

ja GETOUT

mov al, '9'

DONE:

call WriteChar

GETOUT:

pop eax

ret

writeDigit ENDP

end main

7.10

3. Write a procedure named PackedToAsc that converts a 4-byte packed decimal integer to a string of ASCII decimal digits. Pass the packed integer and the address of a buffer holding the ASCII digits to the procedure. Write a short test program that passes at least 5 packed decimal integers to your procedure.

8.10.1

6. What advantages might the C calling convention have over the STDCALL calling convention?

It essentially allows you to have a function with a set number of parameters, which means that you can have a certain number of input for the

Implement DAS with a procedure using other instructions:

mov bl,48h

mov al,85h

sub al,bl

das