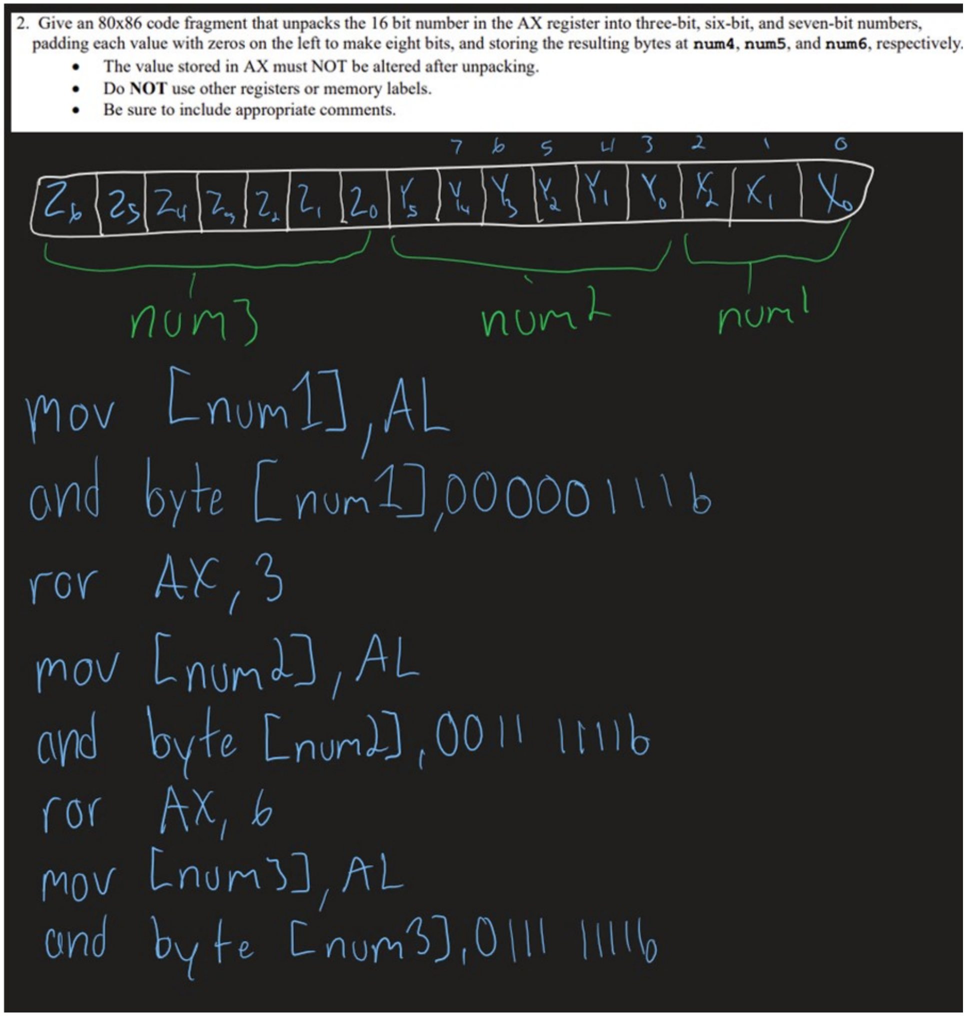
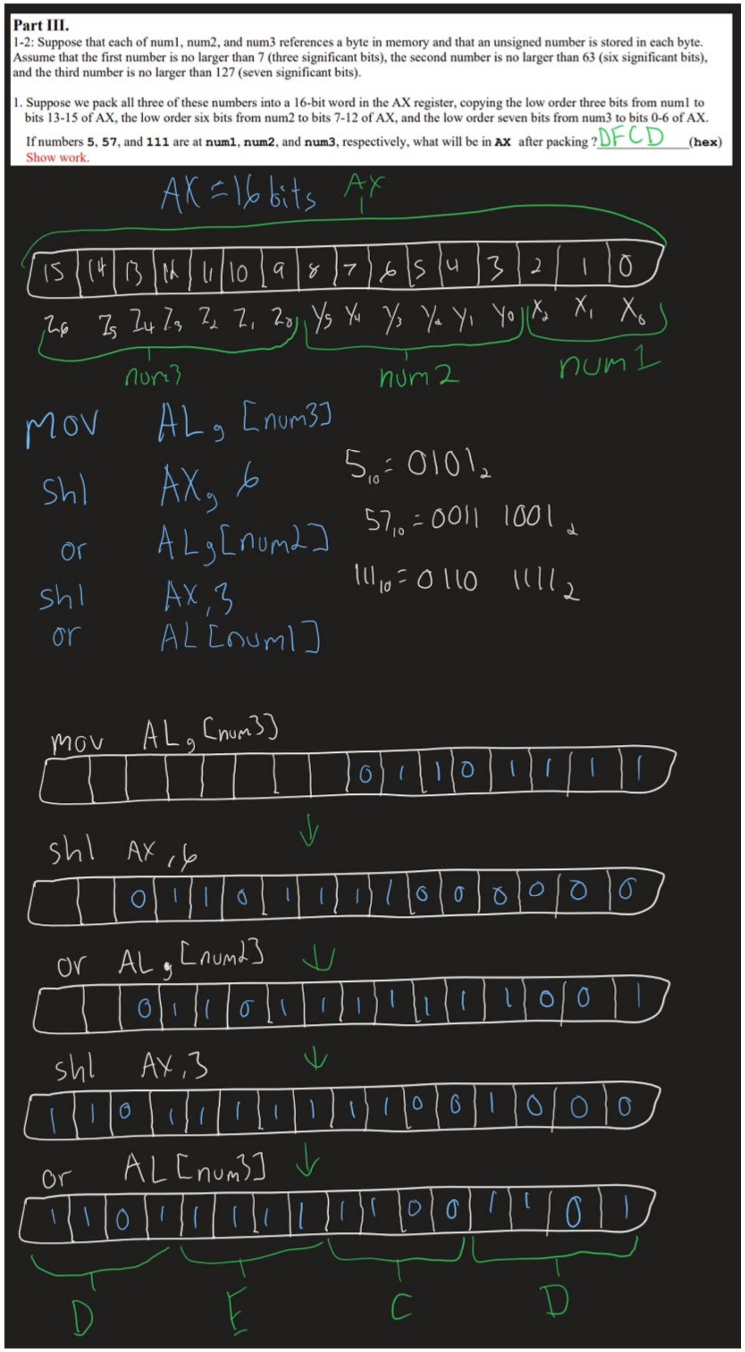


2. Give an 80x86 code fragment that unpacks the 16 bit number in the AX register into three-bit, six-bit, and seven-bit numbers, padding each value with zeros on the left to make eight bits, and storing the resulting bytes at **num4**, **num5**, and **num6**, respectively.
    - The value stored in AX must NOT be altered after unpacking.
    - Do **NOT** use other registers or memory labels.
    - Be sure to include appropriate comments.

								7	6	5	4	3	2	1	0
Z_6	Z_5	Z_4	Z_3	Z_2	Z_1	Z_0	Y_5	Y_4	Y_3	Y_2	Y_1	Y_0	X_2	X_1	X_0

```
mov  [num1],AL
and  byte [num1],00000111b
ror  AX,3
mov  [num2],AL
and  byte [num2],0011 1111b
ror  AX,6
mov  [num3],AL
and  byte [num3],0111 1111b
```



Part III.

1-2: Suppose that each of num1, num2, and num3 references a byte in memory and that an unsigned number is stored in each byte. Assume that the first number is no larger than 7 (three significant bits), the second number is no larger than 63 (six significant bits), and the third number is no larger than 127 (seven significant bits).

1. Suppose we pack all three of these numbers into a 16-bit word in the AX register, copying the low order three bits from num1 to bits 13-15 of AX, the low order six bits from num2 to bits 7-12 of AX, and the low order seven bits from num3 to bits 0-6 of AX.

   If numbers **5**, **57**, and **111** are at **num1**, **num2**, and **num3**, respectively, what will be in **AX** after packing ? DFCD (**hex**)
   Show work.

AX = 16 bits

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Z_6	Z_5	Z_4	Z_3	Z_2	Z_1	Z_0	Y_5	Y_4	Y_3	Y_2	Y_1	Y_0	X_2	X_1	X_0

```
mov  AL, [num3]
shl  AX, 6
or   AL,[num2]
shl  AX,3
or   AL [num1]
```

$5_{10} = 0101_2$

$57_{10} = 0011\ 1001_2$

$111_{10} = 0110\ 1111_2$

mov AL, [num3]

								0	1	1	0	1	1	1	1

shl AX ,6

		0	1	1	0	1	1	1	1	0	0	0	0	0	0

or AL, [num2]

		0	1	1	0	1	1	1	1	1	1	1	0	0	1

shl AX ,3

1	1	0	1	1	1	1	1	1	1	0	0	1	0	0	0

or AL [num3]

1	1	0	1	1	1	1	1	1	1	0	0	1	1	0	1