Recitation

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Example. Binary (Hex) to ASCII (Decimal) Conversion

- CONVERSION PROCEDURE WITH AN EXAMPLE
- 34Dh = 3 x 256 + 4 x 16 + 13 x 1 = 845
- 34Dh / A = 84 remainder (5)
- 84h / A = 8 remainder (4)
- (8) < A the process stops
- Taking the remainders in reverse order gives : 845 decimal

❖Write a program to convert a word sized hex number in data item BINNUM

❖The result will be five digits, each digit will be converted to ASCII and placed in ASCNUM, the lowest digit will be in high memory as the convention of ASCII storage in DOS

Program

```
 BINNUM              DW 34Dh
 ASCNUM DB 5 DUP('0')
.code
MOV       BX, 10
MOV SI  OFFSET ASCNUM
ADD       SI, 4 ;FIFTH PLACE
MOV       AX,BINNUM
BACK:     SUB       DX, DX
DIV       BX;   Dword division DX:AX / BX = AX ; rem DL
OR        DL,30h
MOV       [SI], DL
DEC       SI
CMP       AX,0 ;DIVISION STOPS WHEN RESULT=0
JA        BACK
INT       20H
```

Example Problem

Ex: A linked list is formed of Nodes where each of the nodes is formed of a data and the link to the next Node (address of the next node). The offset address of Node1 is stored in the HEAD pointer AX. For example, in the offset address 1237h (in the data segment), we have 15h as data for Node1 and in the consecutive two locations 1238h and 1239h, we have 23h and 1Ah, respectively. 1A23h is the offset address of the next node. If the offset address field is all zeros, then that means there is no more nodes in the linked list, or equivalently the list is terminated with a pointer to 0000 address. Write a procedure FINDMIN that does a trace in the linked list starting from the given HEAD pointer AX, similar to the example shown below. The trace finds the minimum data among the list and puts it in CL, negative numbers are also in the list. Use signed conditional statements for comparison here.

Node 1

AX=1237 | 1237 | 15 | 1A23

Node 2

1A23 | 10 | 4B08

Node 3

4B08 | 25 | 0000   NIL
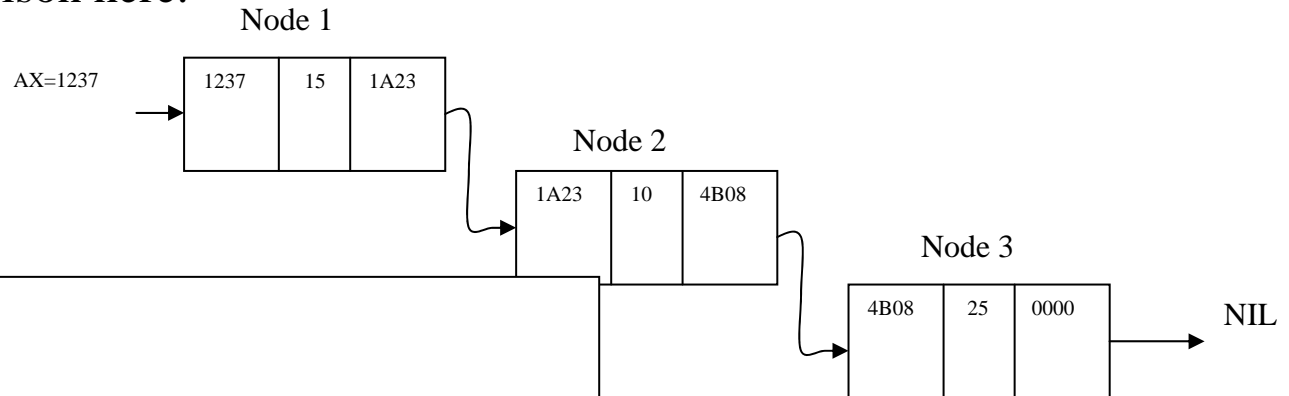
```
FINDMIN     PROC
; write your program here !!
FINDMIN ENDP
MOV    AH,4Ch
INT    21h
MAIN   ENDP
       END MAIN
```

A possible solution

```
FINDMIN        PROC        ; this program traces a linked list.
; initial pointer in AX
MOV CL, FFH
MOV SI,AX
BACK: AND SI,0FFFFH
      JZ Out
      CMP CL,[SI]
      JB HERE
      MOV CL,[SI]
      HERE:
      INC SI
      MOV SI,[SI]
      JMP BACK

Out: MOV    AH,4Ch
INT      21h
FINDMIN ENDP
```

Q6)30 pts)Complete the following addressing for a total of 2Kbytes of memory formed of unknown amount of 1Kx4 memory chips attached to an 8086 microprocessor. You are allowed to attach any gate/chip you like to the DECoder chip's output.. You may only use the input IN1 and output (CS – active low- in your design). Show the ODD and EVEN memory banks and the related decoding circuitry. Assume all the necessary signals are available for this purpose.
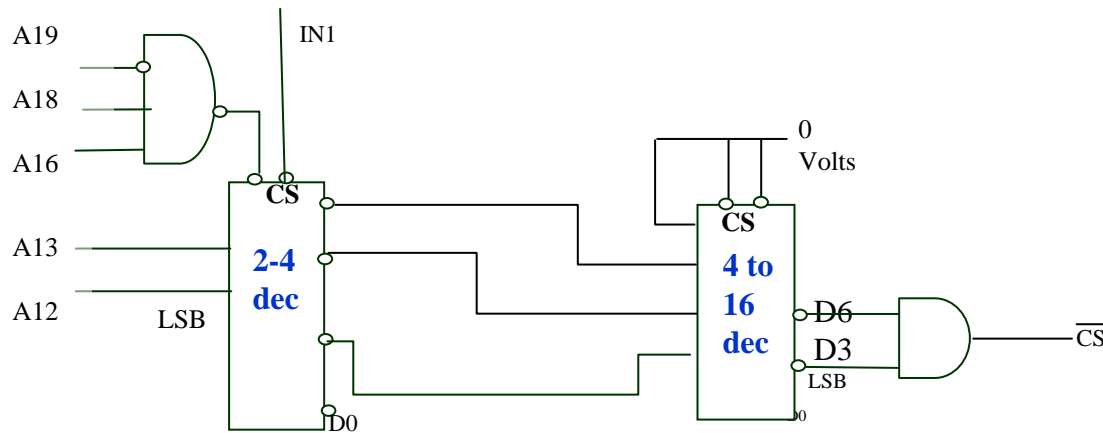
Write down the memory map. List all possible combinations that enables the memory block.

A19	A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0