MICROPROCESSORS AND DESIGN
CSE 311

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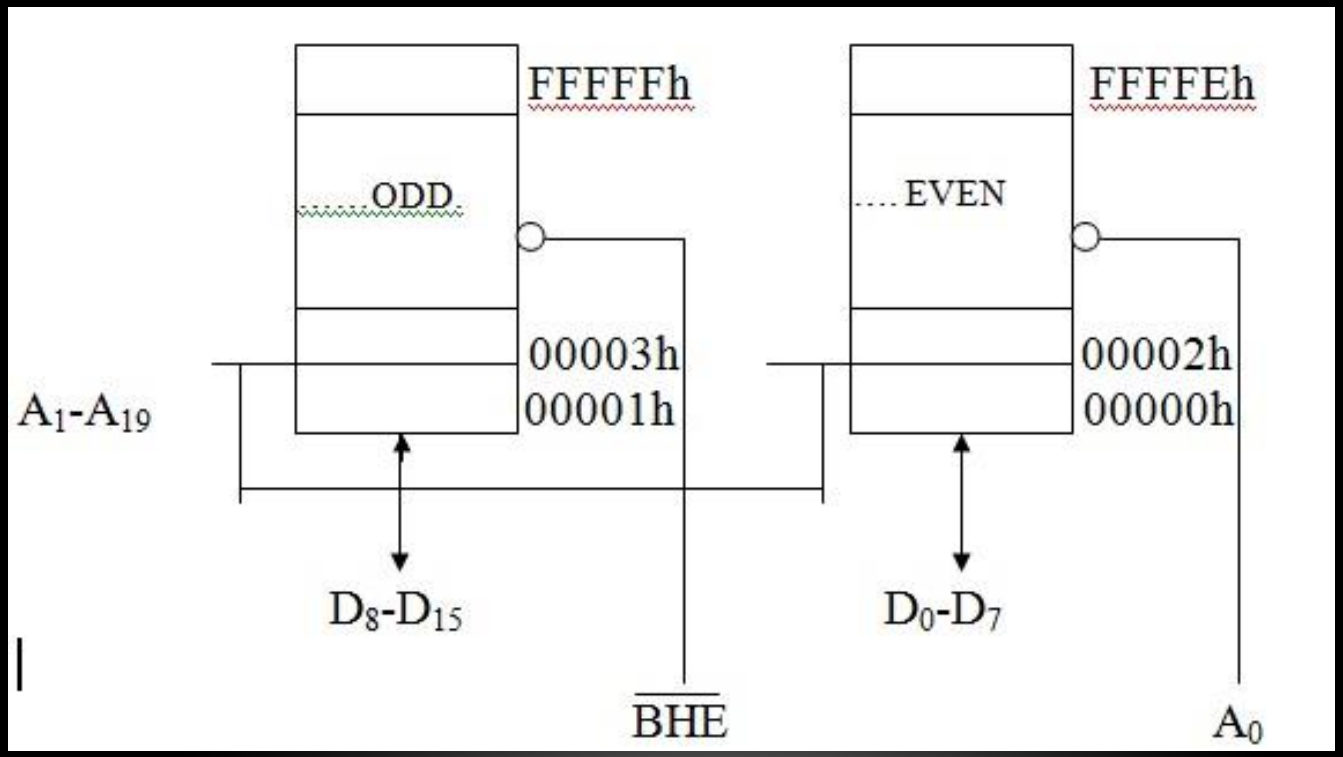
8086 MEMORY BANK CONCEPT

8086 memory is organized as an array of one million bytes i.e. 1MB. The total memory is organized in two separate banks of locations. One is even and the other is odd. Each bank of size 512KB. Therefore the address space is physically implemented on 16-bit data bus.

MEMORY BANK DIAGRAM (ODD AND EVEN SPACES)



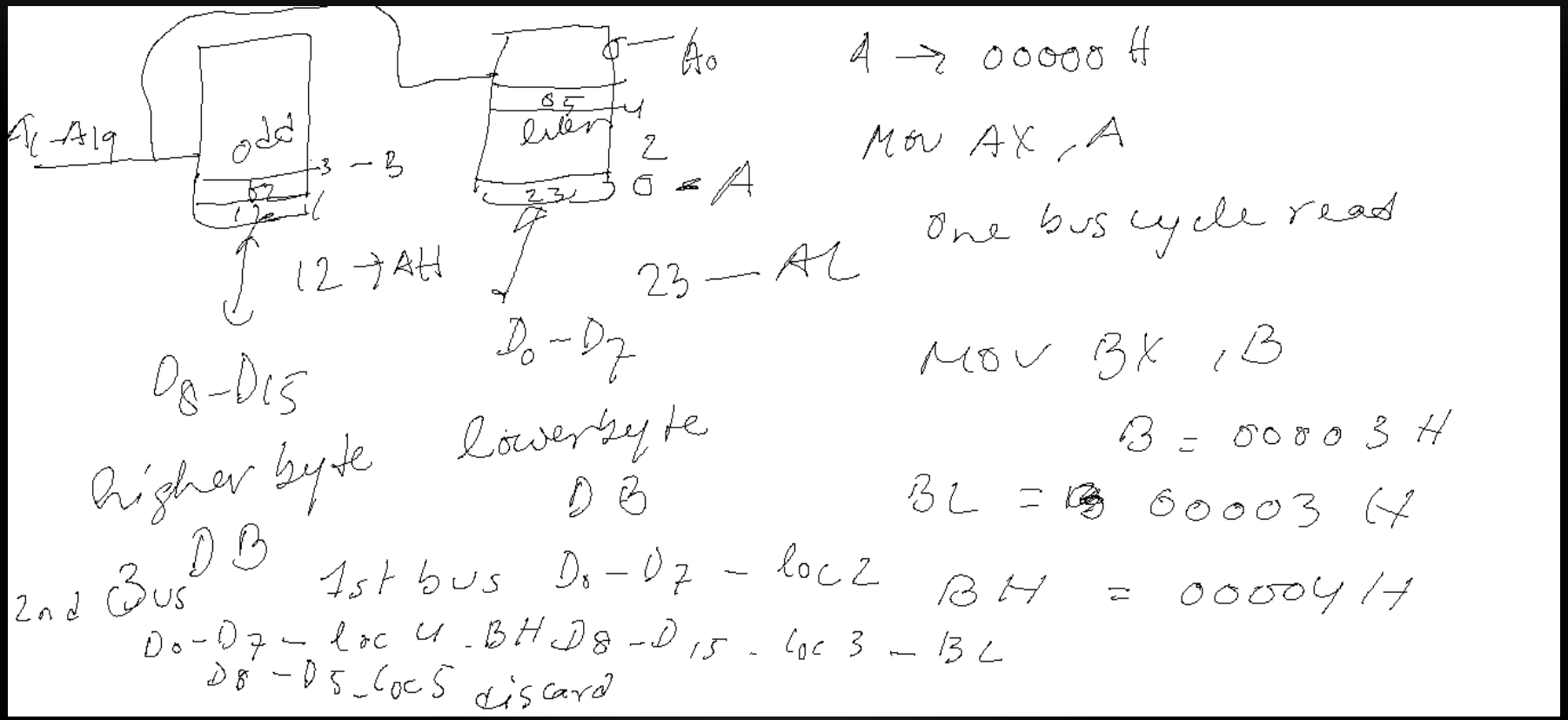
ANALYSIS

Even bank contains even address spaces (A_0=0) and connected to D_0-D_7 data bus and the odd bank contains odd address spaces (A_0=1) and connected to D_8-D_{15} data bus. A particular byte is addressed by A_1-A_{19} address bus with A_0 as selector for even bank. $\overline{BHE}$ is the selector for odd address space.

FUNCTION TABLE

$\overline{BHE}$	A_0	Byte Transferred
0	0	Both bytes using D0-D15
0	1	Byte from odd bank D8-D15
1	0	Byte from even bank D0-D7
1	1	No operation

EXPLANATION



WARM-UP QUESTION

8086 requires one bus cycle to fetch 16-bit data if it starts to read from even space.

8086 requires two bus cycles to fetch odd addressed 16-bit data- Why?