Problem 5 – Half Byte Swapper

You are given **four 32 bit integer** numbers. Your task is to **swap groups of 4 bits between** the 4 numbers. You will be given **series of commands**. Commands end when the last command given is **"End"**. Each command consists of **2 lines** each holding **2 numbers** separated **by space**. The first number in the command shows which number **(0 -3)** will be manipulated and the second number which group **(0-7)** of 4 bits will be swapped. The 2 lines in each command show the 2 numbers that will swap groups of 4 bits. Print the four numbers after all commands have been executed. See the examples on the right to understand you task better.

Example

Numbers	Bits before command							
	7	6	5	4	3	2	1	0
15	0000	0000	0000	0000	0000	0000	0000	1111
165	0000	0000	0000	0000	0000	0000	1010	0101
1001	0000	0000	0000	0000	0000	0011	1110	1001
784	0000	0000	0000	0000	0000	0011	0001	0000

Command
0 0
3 1

	Bits after command							
1	0000	0000	0000	0000	0000	0000	0000	0001
165	0000	0000	0000	0000	0000	0000	1010	0101
1001	0000	0000	0000	0000	0000	0011	1110	1001
1008	0000	0000	0000	0000	0000	0011	1111	0000

Input

Input data is read from the console.

- On the first **4 lines** you will be given **4 32 bit integer** numbers
- On each of the **next 2 lines** will be a single command showing the 2 numbers and groups that will swap bits.
- On the last line on the input will be given the command "End" indicting no more commands will be given

The input data will always be valid and in the format described. There is no need to check it explicitly.

Output

The output data must be printed on the console.

- Print the 4 input numbers on separate line after all commands are executed

Constraints

- The 4 input numbers will be in the range [0... 4, 294,967,295].
- The first number in the command will be between [0-3] and the second between [0-7]
- Time limit: 0.25 seconds. Allowed memory: 16 MB.

Examples

Input	Output
15	1
165	165
1001	1001
784	1008
0 0	
3 1	
End	

Input	Output
165	165
37584	852480
53	53
2345	9439529
1 3	
3 5	
1 1	
1 4	
End	

Input	Output
15	15
983040	15
15728640	15
251658240	15
1 4	
1 0	
2 5	
2 0	
3 6	
3 0	
End	

Input	Output
0	1111
327680	0
1792	0
262144	0
1 4	
0 1	
2 2	
0 0	
3 4	
0 2	
End	