Microprocessor Lab Report (Assignment - 3)

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Format: Question | Assembly Code (Memory Address, OpCode, Mnemonics, Comments)

(* The programs run in simulator seamlessly, though while running into 8085 it's better to use **RST5** instead of **HLT** to return the control to monitor program, without stopping the processor by **HLT**)

(Q1) A set of N data bytes is stored in m/m locations starting from 2501H. The value of N is stored in 2500H, Write a program to store this data byte from m/m 2600H if D0 or D1 is 1; otherwise reject the data byte.

```
2200 21 00 025     LXI H, 2500H; Store the starting address 2500H in HL
register pair.
2203 56      MOV D, M; Move the Content pointed by HL pair to D register.
(N)

2204 23      INX H; Increment H, The consecutive numbers.
2205 01 00 026     LXI B, 2600H; Store the starting address 2600H in BC
register pair.

2208 7E      LOOP: MOV A, M; Move the value (HL) into Accumulator.
2209 E6 81   ANI 081H; AND Immediate with 81H i.e 128+1 (D7 and D0 set bit)

220B CA 11 22      JZ NOSETBIT; If zero flag is set then neither two bits
were set.

       ; If Not store the value into memory location pointed by BC pair
220E 7E      MOV A, M;
220F 02      STAX B;
2210 03      INX B

2211 23      NOSETBIT: INX H; Increment H
2212 15      DCR D; Decrease D
2213 C2 08 022     JNZ LOOP; Zero Flag Set, close loop

2216 76      HLT
```

Start 2500h

Address (Hex)	Address	Data
2500	9472	7
2501	9473	1
2502	9474	4
2503	9475	6
2504	9476	5
2505	9477	128
2506	9478	129
2507	9479	7
2508	9480	0

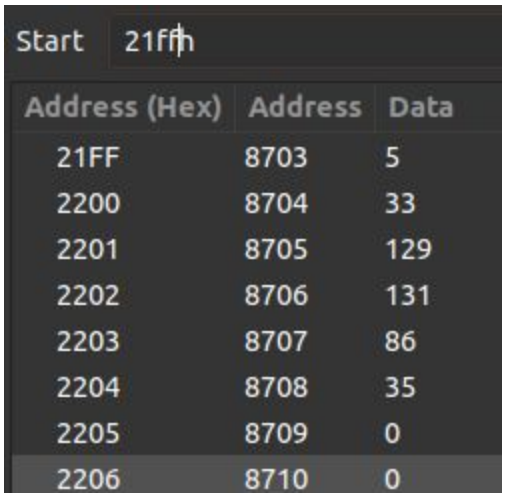
Start 2600h

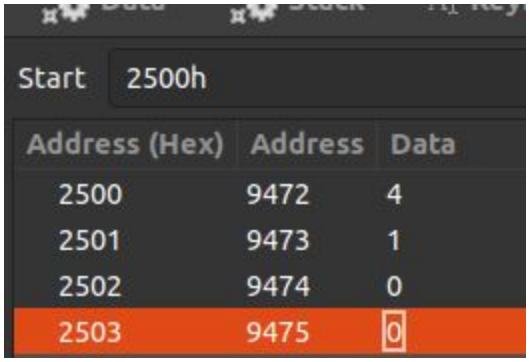
Address (Hex)	Address	Data
2600	9728	1
2601	9729	5
2602	9730	128
2603	9731	129
2604	9732	7
2605	9733	0
2606	9734	0

(Q2) There are N data Bytes stored from m/m location 2200H, the value of N is Stored in 21FFH, Write a program to find the sum of numbers whose LSB and MSB is 1, Store the result in 2500H and 2501H.

```
LXI H, 2200H; Store the starting address 2200H in HL register pair.

LDA 21FFH; Load Accumulator with N(number of elements)

MOV B, A; Move Acc with B, i.e loading the loop counter
MVI C, 00; For Carry
MVI D, 00; For Sum
MVI E, 081H; To compare to check if both bits are set
; 81H i.e 128+1 (D7 and D0 set bit)

LOOP: MOV A, M; Move the content pointed by HL pair to Acc
ANA E; And Immediate with 81H (reason stated above)

CMP E; Compare with 81H, if both bits are set after and Operation.
```

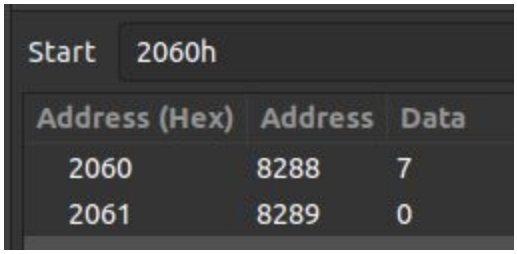
```
JNZ NOSETBIT; If No zero flag they are not equal
; Sum
MOV A,D;
ADD M;
JNC NOCARRY; Checking for carry.
INR C;
NOCARRY: MOV D,A;

NOSETBIT: INX H; Increment H
DCR B; Decrease B the loop counter.

JNZ LOOP; If zero flag is set, stop Looping

; Storing sum through dumping through HL pair.
MOV L, D;
MOV H, C;
SHLD 2500H;
HLT
```

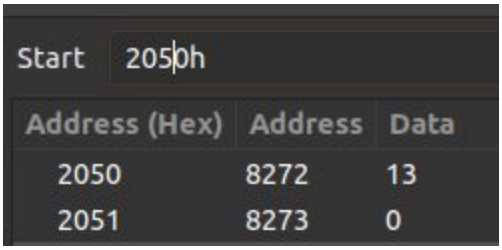




(Q3) Write an 8085 Program to generate Nth Fibonacci numbers **using function** and store it in 2050H. The value of N is stored in 2060H.

```
2200 21 60 20      LXI H, 2060H; Store memory location 2060H in HL pair(the
location contains N).

2203 CD 0B 022     CALL FIB; The Subroutine FIB is going to be executed.
2206 7D      MOV A, L; Move content of Register L to Accumulator(which got
stored during function Execution).
2207 32 50 20      STA 2050H; Store the Ans in 2050H
220A 76      HLT ; Stop execution.



       ;fib function for evaluating fib sequence
220B 0E 00   FIB: MVI C, 00H; Initiate C register with 0H for fib seq
calculation.
220D 16 01   MVI D, 01H; Initiate D register with 1H for fib seq
calculation.
220F 46      MOV B, M; move Current N to B register.
       ; calculation D=C+D and C = OLD_D
2210 79      LOOP: MOV A, C;
2211 82      ADD D;
2212 4A      MOV C, D;
2213 57      MOV D,A;
2214 05      DCR B;
2215 C2 10 22      JNZ LOOP; Looping till N.

2218 69      MOV L,C; Loading the Ans to L register of HL Pair.
2219 C9      RET ; Return from Subroutine.
```





(Q4) Write a function to transfer a block of bytes of size N from location 1 to location 2 (location 2 > location 1) when the size of overlap between the two locations is defined by M, the values of N and M are stored in 201EH and 201FH respectively.

```
2200 21 00 022     LXI H, 2200H; Store the location 1 into HL register
pair.
2203 11 04 022     LXI D, 2204H; Store the location 2 into DE register
pair.
2206 3A 1E 20      LDA 201EH; Load N (number of bytes) in Accumulator.
2209 4F       MOV C, A; Move N (bytes data) to C register.
220A 06 00    MVI B,00H; Clearing B with 00 for DAD.
220C 09       DAD B; shifting HL pair to N bytes ( Double Add)
220D EB       XCHG; Interchange HL and DE pair contents
220E 09       DAD B; Shifting
220F EB       XCHG; re interchange
       ;approach, copy from end to start to rewrite the overlap.
       ; but both HL pair & DL pair points required loc +1
2210 2B       DCX H;
2211 1B       DCX D;

       ;copying from the end to the start.
2212 7E       LOOP: MOV A, M;
2213 12       STAX D;
2214 2B       DCX H;
2215 1B       DCX D;
2216 0D       DCR C;
2217 C2 12 22      JNZ LOOP;
       ; copy Done.
221A 76       HLT;
```

Start 2200h

Address (Hex)	Address	Data
2200	8704	6
2201	8705	8
2202	8706	12
2203	8707	11
2204	8708	9
2205	8709	14
2206	8710	0

Start 2200h

Address (Hex)	Address	Data
2200	8704	6
2201	8705	8
2202	8706	12
2203	8707	11
2204	8708	6
2205	8709	8
2206	8710	12
2207	8711	11
2208	8712	9
2209	8713	14
220A	8714	0

Start 201Eh

Address (Hex)	Address	Data
201E	8222	6
201F	8223	2
2020	8224	0