MIT ASSIGNMENT – 4

1. **Write a program to check the 4th bit of 8-numbers stored from location 2000H.**

```
;Program1
mvi b,8h
lxi h,2000h
lxi d,2008h
loop: mov a,m
ani 10h
rrc
rrc
rrc
rrc
stax d
inx d
inx h
dcr b
mov a,b
jnz loop
hlt
```

2. **Write a program to swap lower 4 bit nibble with upper 4 bit nibble of 8 bit data at memory location 2100H and place a result to location 2101H.**

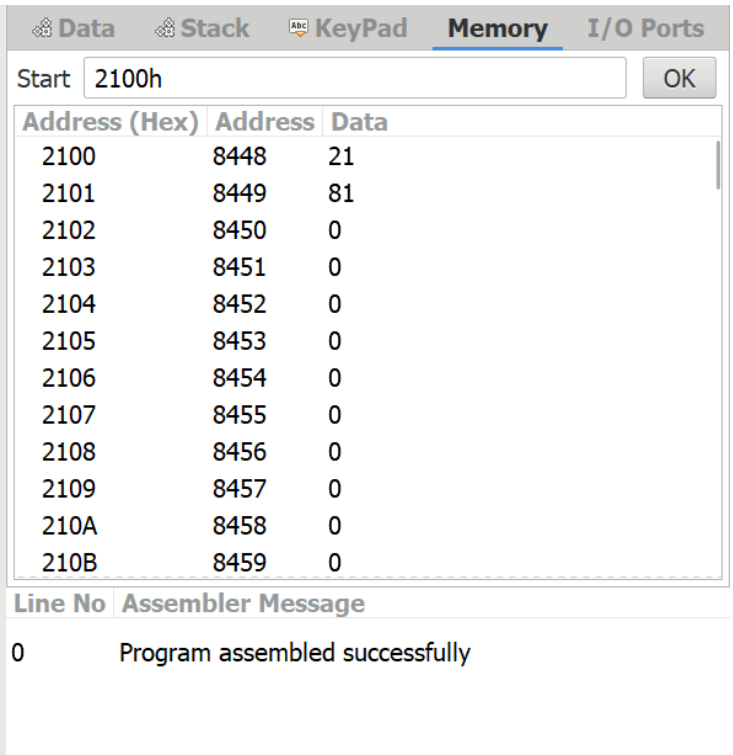
Data | Stack | KeyPad | **Memory** | I/O Ports

Start 2000h OK

Address (Hex)	Address	Data
2000	8192	16
2001	8193	8
2002	8194	19
2003	8195	20
2004	8196	24
2005	8197	11
2006	8198	5
2007	8199	21
2008	8200	1
2009	8201	0
200A	8202	1
200B	8203	1
200C	8204	1
200D	8205	0
200E	8206	0
200F	8207	1

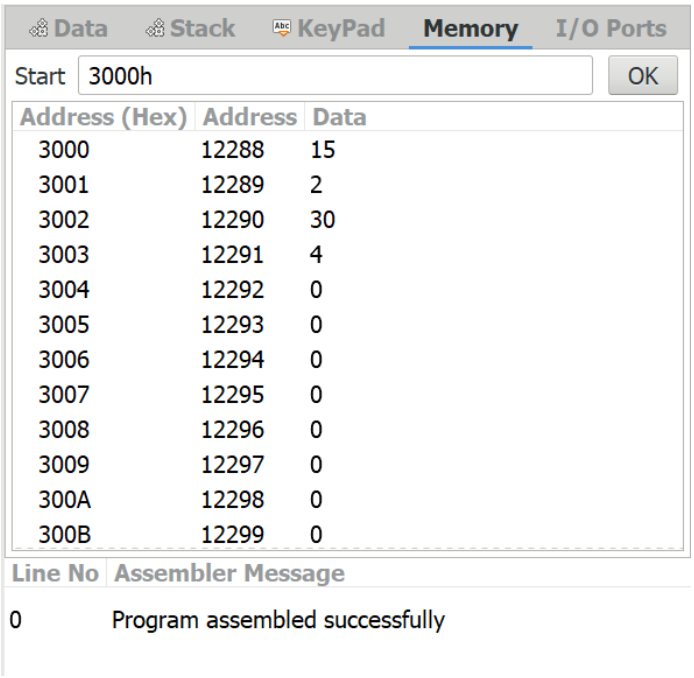
```
;Program2
;Value stored at 2100h is 21 (decimal)
lda 2100h
mov b,a
ani 0F0h
```

```
rrc
rrc
rrc
rrc
mov c,a
mov a,b
ani 0Fh
rlc
rlc
rlc
rlc
add c
sta 2101h
hlt
```



3. Write a Program to shift a 16-bit data 1 bit left. Assume data is in the HL register pair

```
;Program3
;Number is 020Fh : 0000 0010 0000 1111 (decimal)
;On shifting left by 1 bit: 0000 0100 0001 1110 : 041Bh
lhld 3000h
dad h
shld 3002h
hlt
```



4. Write a Program to calculate the factorial of a number between 0 to 8.

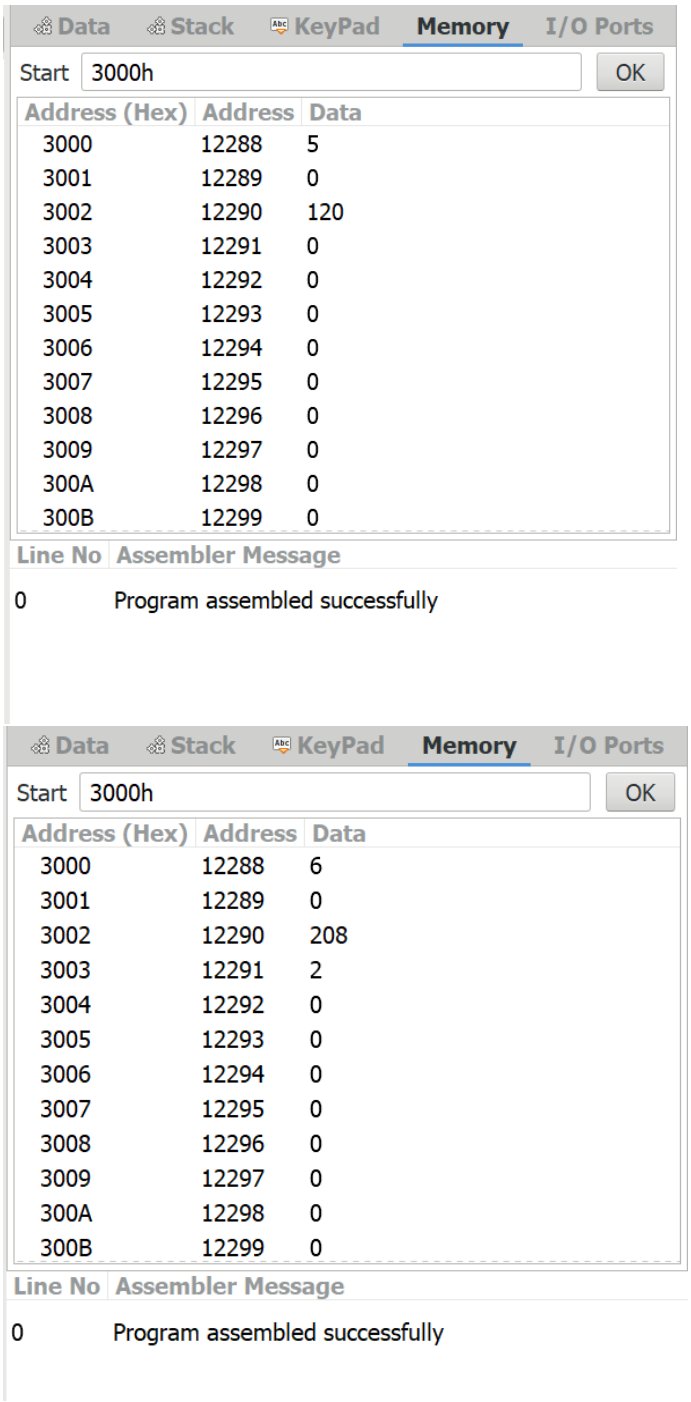
```
;Program4
lhld 3000h
mvi d,0
mvi e,0
xchg
mov b,e

start: dcr b
mov a,b
cpi 01
jz end
mov c,b
call factorial
mov d,h
mov e,l
mov b,c
mvi h,0
mvi l,0
jmp start

end: xchg
shld 3002h
hlt

factorial: dad d
dcr b
```

jz rt
call factorial
rt: ret

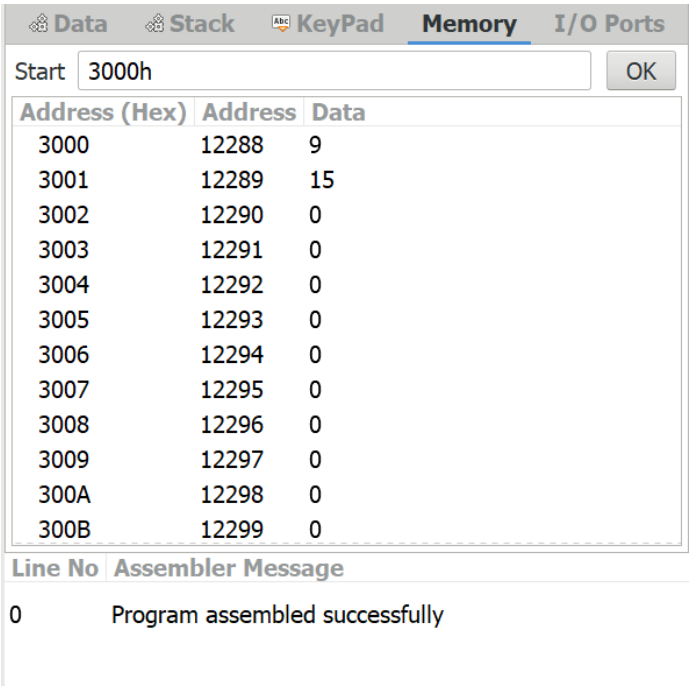


6! =720 which is 2D0 in hex (0000 0010 1101 0000 in binary).
0000 0010 = $(2)_{10}$
1101 0000 = $(208)_{10}$
2 is stored in location 3003h 208 is stored at 3002h.

5. Write a program to Split 8 bit HEX data into two nibbles and store it in memory.

```
;Program5
mvi a,9Fh
mov b,a
ani 0F0h
```

```
rrc
rrc
rrc
rrc
sta 3000h
mov a,b
ani 0Fh
sta 3001h
hlt
```



Data | Stack | KeyPad | **Memory** | I/O Ports

Start 3000h OK

Address (Hex)	Address	Data
3000	12288	9
3001	12289	15
3002	12290	0
3003	12291	0
3004	12292	0
3005	12293	0
3006	12294	0
3007	12295	0
3008	12296	0
3009	12297	0
300A	12298	0
300B	12299	0

Line No	Assembler Message
0	Program assembled successfully