

CS1050 – Computer Organization & Digital Design

Lab 8 – Lab Report

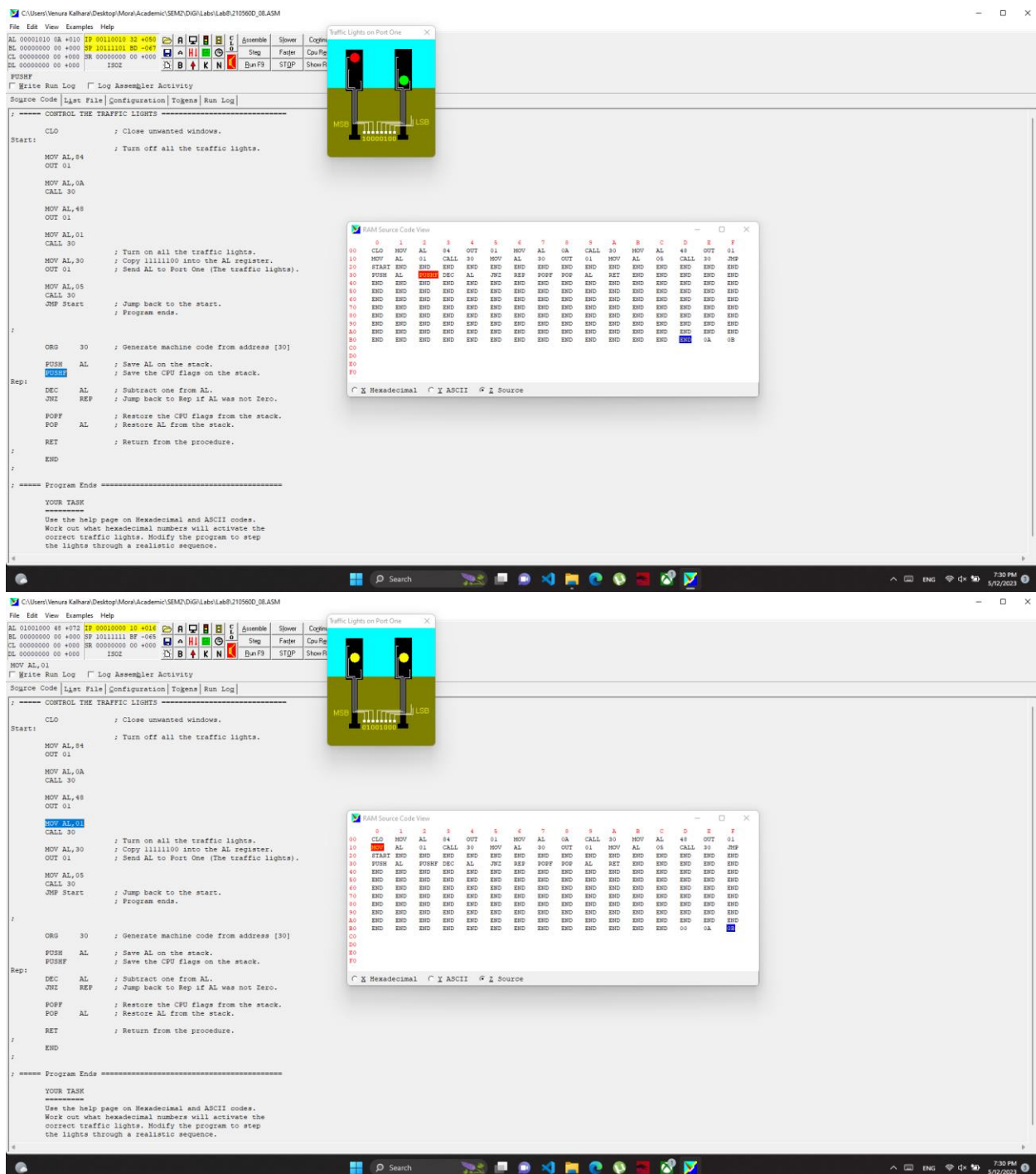
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1) Lab Tasks :

To get familiar with assembly language.

2) Screenshots



C:\Users\Venura Kaluar\Desktop\More\Academic\SEM7\DIG\Lab\Lab#210560D_08.ASM

File Edit View Examples Help

AL 00110000 30 +000 IF 00011010 1A +000
BL 00000000 00 +000 SF 10111111 BF -005
CL 00000000 00 +000 SR 00000000 00 +000
DL 00000000 00 +000 100Z

MOV AL,05

Write Run Log Log Assembler Activity

Source Code List File Configuration Tokens Run Log

```
1 ; ===== CONTROL THE TRAFFIC LIGHTS =====  
2 CLO ; Close unwanted windows.  
3  
4 START: ; Turn off all the traffic lights.  
5 MOV AL,04  
6 OUT 01  
7  
8 MOV AL,0A  
9 CALL 30  
10  
11 MOV AL,48  
12 OUT 01  
13  
14 MOV AL,01  
15 CALL 30  
16 ; Turn on all the traffic lights.  
17 MOV AL,30  
18 OUT 01  
19 ; Send AL to Port One (The traffic lights).  
20 CALL 30  
21 JNP Start ; Jump back to the start.  
22 ; Program ends.  
23  
24 ;  
25 ORG 30 ; Generate machine code from address [30]  
26  
27 PUSH AL ; Save AL on the stack.  
28 PUSHF  
29  
30 DEC AL ; Subtract one from AL.  
31 JNZ REP ; Jump back to Rep if AL was not zero.  
32  
33 POPF AL ; Restore the CPU flags from the stack.  
34 POP AL ; Restore AL from the stack.  
35  
36 RET ; Return from the procedure.  
37  
38 END  
39  
40 ;  
41  
42 ; ===== Program Ends =====  
43  
44 YOUR TASK  
45  
46 Use the help page on Hexadecimal and ASCII codes.  
47 Work out what hexadecimal numbers will activate the  
48 correct traffic lights. Modify the program to step  
49 the lights through a realistic sequence.
```

Traffic Lights on Port One

MSB 00110000 LSB

RAM Source Code View

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	CLO	MOV	AL	04	OUT	01	MOV	AL	0A	CALL	30	MOV	AL	48	OUT	01
10	MOV	AL	01	CALL	30	MOV	AL	30	OUT	01	CALL	30	JNP	Start		
20	START	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
30	PUSH	AL	PUSHF	DEC	AL	JNZ	REP	POPF	POP	AL	RET	END	END	END	END	END
40	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
50	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
60	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
70	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
80	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
90	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
A0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
B0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
C0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
D0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
E0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
F0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END

Hexadecimal ASCII Source

C:\Users\Venura Kaluar\Desktop\More\Academic\SEM7\DIG\Lab\Lab#210560D_10.ASM

File Edit View Examples Help

AL 11111100 FC +000 IF 00000011 03 +000
BL 00000000 00 +000 SF 10111111 BF -005
CL 00000000 00 +000 SR 00000000 00 +000
DL 00000000 00 +000 100Z

OUT 02

Write Run Log Log Assembler Activity

Source Code List File Configuration Tokens Run Log

```
1 ; ===== Seven Segment Displays Port 02 =====  
2  
3 START: MOV AL,FC  
4 OUT 02  
5  
6 MOV AL,FB  
7 OUT 02  
8  
9 MOV AL,0  
10 OUT 02  
11  
12 MOV AL,1  
13 OUT 02  
14  
15 JNP Start  
16  
17 END  
18  
19 ;  
20  
21 ; ===== Program Ends =====  
22  
23 YOUR TASK  
24  
25 Use the help page on Hexadecimal and ASCII codes.  
26 Work out what hexadecimal numbers will activate the  
27 correct traffic lights. Modify the program to step  
28 the lights through a realistic sequence.
```

Seven Segment Displays

PORT 2

MSB 11111101 LSB

RAM Source Code View

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	MOV	AL	FC	OUT	02	MOV	AL	FB	OUT	02	JNP	START	END	END	END	END
10	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
20	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
30	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
40	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
50	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
60	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
70	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
80	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
90	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
A0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
B0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
C0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
D0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
E0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
F0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END

Hexadecimal ASCII Source

C:\Users\Vensura Kalhara\Desktop\MoralAcademic\SEM4\DIG\LabLabR\210560D_11.ASM

File Edit View Examples Help

AL 11111111 FF -001 1F 00110011 7F +11F
BL 10111000 B0 -072 1F 00111110 BE -044
CL 00011000 1F +024 1F 00011000 0F +008
DL 00000100 05 +005 1202

Assembly Stopped
Step Faster CPU Re
Run F9 STDP Show R

Stop
Write Run Log Log Assembler Activity

Source Code | List File | Configuration | Tokens | Run Log

DB 4E
DB DC
DB FC
DB BA
DB FE
DB CE
DB EE
DB 6C
DB F0
DB 3E
DB F4
DB E4

ORG 40

Start:
MOV DL,1
MOV CL,1
CALL 70
PUSH CL
POP AL
POP BL
DIV AL,10
MOD BL,10
ADD AL,B0
MOV AL,[AL]
OUT 02
PUSH CL
POP AL
JMP Start

ORG 70

Rep:
CMP DL,6
JL 70
INC CL
JMP Rep

ORG 7C

Stop:
RET

Seven Segment Displays

PORT 2
MSD 11111111 LBD

RAM Source Code View

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	JMP	START	END	END	END	END	END	END	END	END	END	END	END	END	END	END
10	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
20	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
30	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
40	MOV	DL	1	MOV	CL	1	CALL	70	STPB	CL	POP	AL	PUSH	CL	POP	BL
50	DIV	AL	10	MOD	BL	10	ADD	AL	B0	MOV	AL	[AL]	OUT	02	ADD	BL
60	B0	MOV	CL	[BL]	INC	CL	PUSH	CL	POP	AL	OUT	02	JMP	START	END	END
70	CMP	DL	6	JL	70	INC	CL	DL	INC	DL	JMP	REP	RET	END	END	END
80	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
90	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
A0	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END	END
B0	FA	0B	C4	5D	4E	DC	FC	5A	FE	CE	EE	6C	F0	3E	E4	40
C0																
D0																
E0																
F0																

Hexadecimal ASCII Source

7:31 PM 5/12/2023