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EXAMPLE OF ASSEMBLY LANGUAGE PROGRAM

EXAMPLE-1 Object: Place 05 in register B

Memory address	Machine Codes	Mnemonics	Operands	Comments
FC 00	06, 05	MVI	B, 05	Get 05 in reg. B
FC 02	76	HLT		stop

EXAMPLE-2 Object: Get 05 in reg. A, then move it to reg. B

FC 00	3E, 05	MVI	A, 05	Get 05 in reg. A
FC 02	47	MOV	B, A	Transfer 05 from B to A
FC 03	76	HLT		Stop

EXAMPLE-3 Load the content of memory location FC50H directly to the accumulator, then transfer it to reg. B. The content of the memory location FC50H is 05

FC 00	3A, 50, FC	LDA	FC50
FC 03	47	MOV	B, A
FC 04	76	HLT.	

DATA
FC50 - 08

EXAMPLE-4 Move the content of the memory location FC50H to reg. C. The content of the memory location FC50H is 08

FC00	21, 50, FC	LXI	H, FC50
FC03	4E	MOV	C, M
FC04	76	HLT	

DATA
FC50-08

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

EXAMPLE-5 Place the content of the memory location FC50H in reg. B and that of FC51H in reg. C The content of FC50 and FC51 are 11H and 12H respectively.

Memory Address	machine Codes	Mnemonics	Operands	Comments.
FC00	21, 50, FC	LXI	H, FC50H	
FC03	46	MOV	B, M	
FC04	23	INX	H	
FC05	4E	MOV	C, M	
FC06	76	HLT		

Data
FC50 – 11H
FC51 – 12H

EXAMPLE-5A Place 05 in the accumulator. Increment it by one and store the result in the memory location FC50H

FC00	3E, 05	MVI	A, 05
FC02	3C	INR	A
FC03	32, 50, FC	STA	FC50H
FC06	76	HLT	

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

EXAMPLE 6: Addition of two 8-bit Numbers; SUM 8-bit

Memory Address	Machine Codes	Labels (if Any) ^ Mnemonics	Operands	Comments:
2000	21,01,25	LXI	H, 2501H	
2003	7E	MOV	A, M	
2004	23	INX	H	
2005	86	ADD	M	
2006	32,03,25	STA	2503H	
2009	76	HLT		

Data
2501 - 49H
2502 - 56H
Result
2503 - 9FH

EXAMPLE 7: Addition of Two 8-bit Numbers; SUM 16-bits

2000	21,01,25	LXI	H, 2501H
2003	0E,00	MVI	C, 00
2005	7E	MOV	A, M
2006	23	INX	H
2007	86	ADD	M
2008	D2,0C,20	JNC	AHEAD
200B	0C	INR	C
200C	32,03,25	AHEAD STA	2503H
200F	79	MOV	A, C
2010	32,04,25	STA	2504H
2013	76	HLT	

Data
2501 - 98H
2502 - 9AH
Result 2503 - 32H LSBs of SUM 2504 01H MSBs of sum

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

Example 8: Decimal Addition of two 8-bit Numbers; SUM 16 Bits.

Memory Address	Machine Codes	Labels	Mnemonics	Operands	Comments
2000	21,01,25		LXI	H,2501H	
2003	0E,00		MVI	C,00	
2005	7E		MOV	A,M	
2006	23		INX	H	
2007	86		ADD	M	
2008	27		DAA		
2009	D2,0D,20		JNC	AHEAD	
200C	0C		INR	C	
200D	32,03,25	AHEAD	STA	2503H	
2010	79		MOV	A,C	
2011	32,04,25		STA	2504H	
2014	76		HLT		

Data
2501 - 84D
2502 - 75D

Result
2503 - 59D LSDs
2504 - 01D MSDs

EXAMPLE 9: Addition of two 16bit Numbers, SUM: 16 Bit or more

2000	2A,01,25		LHLD	2501H
2003	EB		XCHG	
2004	2A,03,25		LHLD	2503H
2007	0E,00		MVI	C,00
2009	19		DAD	D
200A	D2,0E,20		JNC	AHEAD
200D	0C		INR	C
200E	22,05,25	AHEAD	SHLD	2505H
2011	79		MOV	A,C
2012	32,07,25		STA	2507H
2015	76		HLT	

Data
2501 - 98H LSB
2502 - 5BH MSB
2503 - 4CH LSB
2504 - 8EH
Result
2505 - E4 LSB
2506 - E9 LSB
2507 - 00 MSB

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd.)

EXAMPLE 10: 8-bit Subtraction

Memory Address	Machine Codes	Mnemonics	Operands	Comments
2000	21, 01, 25	LXI	H, 2501H	
2003	7E	MOV	A, M	
2004	23	INX	H	
2005	96	SUB	M	
2006	23	INX	H	
2007	77	MOV	M, A	
2008	76	HLT		

Data
2501 – 49H
2502 – 32H

Result
2503 – 17H

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

EXAMPLE 11: 8 bit Decimal Subtraction

Memory Address	Machine Codes	Mnemonics	Operands	Comments.
2000	21,02,25	LXI	H, 2502H	
2003	3E,09	MVI	A, 99	
2005	96	SUB	M	9's comp. of 2nd no.
2006	3C	INR	A	10's comp of 2nd no.
2007	2B	DCX	H	
2008	86	ADD	M	
2009	27	DAA		
200A	32,03,25	STA	2503H	
200D	76	HLT		

Data
2501 - 96 D
2502 - 38 D

Result
2503 - 58 D

(NOTE: 96 + 10's complement of 38)

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Unit II – 8-bit Microprocessors (Intel-8085)

EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

EXAMPLE: 12 One's complement of an 8-bit Number.

Memory Address	Machine codes	Mnemonics	Operands	Comments.
2000	3A, 01, 25	LDA	2501H	
2003	2F	CMA		
2004	32, 02, 25	STA	2502H	
2007	76	HLT		

Data
2501 – 96H

Result
2502 – 69H

EXAMPLE: 13 One's complement of a 16-bit Number.

2000	21, 01, 25	LXI	H, 2501H
2003	7E	MOV	A, M
2004	2F	CMA	
2005	32, 03, 25	STA	2503H
2008	23	INX	H
2009	7F	MOV	A, M
200A	2F	CMA	
200B	32, 04, 25	STA	2504H
200E	76	HLT	

Data
2501 – 85H
2502 – 54H

Result
2503 – 7AH
2504 – ABH

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

EXAMPLE 14: Two's complement of an 8-bit number

Memory Address	Machine Codes	Labels	Mnemonics	Operands	Comments
2000	3A, 01, 25		LDA	2501H	
2003	2F		CMA		
2004	3C		INR	A	
2005	32, 02, 25		STA	2502H	
2008	76		HLT		

EXAMPLE 15: Two's Complement of a 16-bit number

2000	21, 01, 25		LXI	H, 2501H
2003	06, 00		MVI	B, 00
2005	7E		MOV	A, M
2006	2F		CMA	
2007	C6, 01		ADI	01
2009	32, 03, 25		STA	2503 H
200C	D2, 10, 20		JNC	GO
200F	04		INR	B
2010	23	GO	INX	H
2011	7E		MOV	A, M
2012	2F		CMA	
2013	80		ADD	B
2014	32, 04, 25		STA	2504 H
2017	76		HLT	

Data
2501 – 8C H LSBs of the number
2502 – 5B H MSBs of the number

Result
2503 – 74 LSBs of result
2504 – A4 MSBs of result

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd.)

EXAMPLE 17: 8 Bit Division

Memory Address	Machine Codes	Labels	Mnemonics	Operands	Comments
2000	2A, 01, 25		LHLD	2501H	
2003	3A, 03, 25		LDA	2503H	
2006	47		MOV	B, A	
2007	0E, 08		MVI	C, 08	
2009	29	LOOP	DAD	H	
200A	7C		MOV	A, H	
200B	90		SUB	B	
200C	DA, 11, 24		JC	AHEAD	
200F	67		MOV	H, A	
2010	2C		INR	L	
2011	0D	AHEAD	DCR	C	
2012	C2, 09, 24		JNZ	LOOP	
2015	22, 04, 25		SHLD	2504H	
2018	76		HLT		

Data
2501 – 9B H LSBs of dividend
2502 – 48 H MSBs of dividend
2503 – 1A H Divisor

Result
2504 – F2 Quotient
2505 – 07 Remainder

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EXAMPLES OF ASSEMBLY LANGUAGE PROGRAM (Contd..)

EXAMPLE 16: 8-bit Multiplication; Product 16-bit

Memory Address	Machine Codes	Labels	Mnemonics	Operands	Comments
2000	2A, 01, 25		LHLD	2501 H	
2003	EB		XCHG		
2004	3A, 03, 25		LDA	2503H	
2007	21, 00, 00		LXI	H, 0000	
200A	0E, 08		MVI	C, 08	
200C	29	LOOP	DAD	H	
200D	17		RAL		
200E	D2, 12, 20		JNC	AHEAD	
2011	19		DAD	D	
2012	0D	AHEAD	DCR	C	
2013	C2, 0C, 20		JNZ	LOOP	
2016	22, 04, 25		SHLD	2504H	
2019	76		HLT		

Data
2501 – 84H LSBs of Multiplicand
2502 – 00H MSBs of Multiplicand
2503 – 56H Multiplier

Result
2504 – 58H LSBs of Product 2505 – 2CH MSBs of Product