

Subtraction of two 8-bit numbers without carry

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SUBTRACTION OF TWO 8-BIT NUMBER WITHOUT CARRY

AIM

To write an assembly language program to subtract two 8-bit numbers with two modes (i) Indirect mode, (ii) Direct mode

INDIRECT ADDRESSING MODE

ASSEMBLY LANGUAGE PROGRAM

```

C000 LXI H C100 21 ; Load the HL register pair immediately
C001                00 ;
C002                C1 ;
C003 MOV A M      7E ; Move the content of memory (subtrahend) to
                    accumulator
C004 INX H        23 ; Increment the HL register pair
C005 SUB M        96 ; Subtract the memory content (minuend) from
                    accumulator
C006 INX H        23 ; Increment the HL register pair
C007 MOV M A      77 ; Move the content of accumulator (difference)
                    to memory
C008 HLT          76 ; Halt the execution

```

EXECUTION

```

C100 AF ; Subtrahend (Input data)
C101 08 ; Minuend (Input data)
C102 A7 ; Difference (Output data)

```

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C000	21	LXI H C100	00	00	00	00	00	C1	00	0000	0000 0000
C003	7E	MOV A M	AF	00	00	00	00	C1	00	0000	0000 0000
C004	23	INX H	AF	00	00	00	00	C1	01	0000	0000 0000
C005	96	SUB M	A7	00	00	00	00	C1	01	0000	1001 0000
C006	23	INX H	A7	00	00	00	00	C1	02	0000	1001 0000
C007	77	MOV M A	A7	00	00	00	00	C1	02	0000	1001 0000
C008	76	HLT	A7	00	00	00	00	C1	02	0000	1001 0000

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
1	0	0	1	0	0	0	0

DIRECT ADDRESSING MODE

ASSEMBLY LANGUAGE PROGRAM

```

C200 LDA  C900  3A ; Load the accumulator with minuend
C201                00 ;
C202                C9 ;
C203 MOV  B A   47 ; Move the content of accumulator to B
                    register(minuend)
C204 LDA  C901  3A ; Load the accumulator with subtrahend
C205                01 ;
C206                C9 ;
C207 SUB  B     90 ; Subtract the B register content (minuend)
                    from accumulator (subtrahend)
C208 STA  C902  32 ; Store the content of the accumulator
C209                02 ; (difference)at memory location C902H
C20A                C9 ;
C20B HLT                    76 ; Halt the execution

```

EXECUTION

```

C900 08 ; Minuend(Input data)
C901 AF ; Subtrahend(Input data)
C902 A7 ; Difference(Output data)

```

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C200	3A	LDA C900	08	00	00	00	00	00	00	0000	0000 0000
C203	47	MOV B A	08	08	00	00	00	00	00	0000	0000 0000
C204	3A	LDA C901	AF	08	00	00	00	00	00	0000	0000 0000
C207	90	SUB B	A7	08	00	00	00	00	00	0000	1001 0000
C208	32	STA C902	A7	08	00	00	00	00	00	0000	1001 0000
C20B	76	HLT	A7	08	00	00	00	00	00	0000	1001 0000

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
1	0	0	1	0	0	0	0

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