Summation of N 8-bit number

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SUMMATION OF N 8-BIT NUMBERS

AIM

To write an assembly language program to calculate the sum of n 8 bit numbers

ASSEMBLY LANGUAGE PROGRAM

```
C100 LXI H C200  21 ; Load the HL register pair immediately
C101             00 ;
C102             C2 ;
C103 MOV B M     46 ; Move the memory content(Total number of
                      data) in to B register
C104 MVI C 00    0E ; Initialize the C register with 00H
C105             00 ;
C106 SUB A       97 ; Clear the accumulator
C107 INX H       23 ; Increment the HL register pair (to get the
                      next input data)
C108 MOV A M     7E ; Move the memory content in to accumulator
C109 DCR B       05 ; Decrement the B register content
C10A INX H       23 ; Increment the HL register pair
C10B ADD M       86 ; Add the memory content to accumulator
C10C JNC C110    D2 ; Jump if carry = 0, to C110H
C10D             10 ;
C10E             C1 ;
C10F INR C       0C ; Increment the C register content
C110 DCR B       05 ; Decrement the B register content
C111 JNZ C10A    C2 ; Jump if no zero to C10AH
C112             0A ;
C113             C1 ;
C114 STA  C300   32 ; Store the accumulator content(sum) at C300H
C115             00 ;
C116             C3 ;
C117 MOV A C     79 ; Move the C register content to accumulator
C118 STA  C301   32 ; Store the accumulator content(carry) at C300H
C119             01 ;
C11A             C3 ;
C11B HLT         76 ; Halt the exection
```

EXECUTION 1

```
C200 05 ; Number of input data
C201 25 ; Input data
C202 76 ; Input data
C203 AA ; Input data
C204 B7 ; Input data
C205 F8 ; Input data
C206 00 ; Input data
```

```
C300 F4 ; Sum(Output)
C301 02 ; Carry(Output)
```

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
C100	21	LXI H C200	00	00	00	00	00	C2	00	0000	0000 0000
C103	46	MOV B M	00	05	00	00	00	C2	00	0000	0000 0000
C104	0E	MVI C 00	00	05	00	00	00	C2	00	0000	0000 0000
C106	97	SUB A	00	05	00	00	00	C2	00	0000	0100 0101
C107	23	INX H	00	05	00	00	00	C2	01	0000	0100 0101
C108	7E	MOV A M	25	05	00	00	00	C2	01	0000	0100 0101
C109	05	DCR B	25	04	00	00	00	C2	01	0000	0001 0001
C10A	23	INX H	25	04	00	00	00	C2	02	0000	0001 0001
C10B	86	ADD M	9B	04	00	00	00	C2	02	0000	1000 0000
C10C	D2	JNC C110	9B	04	00	00	00	C2	02	0000	1000 0000
C110	05	DCR B	9B	03	00	00	00	C2	02	0000	0001 0100
C111	C2	JNZ C10A	9B	03	00	00	00	C2	02	0000	0001 0100
C10A	23	INX H	9B	03	00	00	00	C2	03	0000	0001 0100
C10B	86	ADD M	45	03	00	00	00	C2	03	0000	0001 0001
C10C	D2	JNC C110	45	03	00	00	00	C2	03	0000	0001 0001
C10F	0C	INR C	45	03	01	00	00	C2	03	0000	0000 0001
C110	05	DCR B	45	02	01	00	00	C2	03	0000	0001 0001
C111	C2	JNZ C10A	45	02	01	00	00	C2	03	0000	0001 0001
C10A	23	INX H	45	02	01	00	00	C2	04	0000	0001 0001
C10B	86	ADD M	FC	02	01	00	00	C2	04	0000	1000 0100
C10C	D2	JNC C110	FC	02	01	00	00	C2	04	0000	1000 0100
C110	05	DCR B	FC	01	01	00	00	C2	04	0000	0001 0000
C111	C2	JNZ C10A	FC	01	01	00	00	C2	04	0000	0001 0000
C10A	23	INX H	FC	01	01	00	00	C2	05	0000	0001 0000
C10B	86	ADD M	F4	01	01	00	00	C2	05	0000	1001 0001
C10C	D2	JNC C110	F4	01	01	00	00	C2	05	0000	1001 0001
C10F	0C	INR C	F4	01	02	00	00	C2	05	0000	0000 0001
C110	05	DCR B	F4	00	02	00	00	C2	05	0000	0101 0101
C111	C2	JNZ C10A	F4	00	02	00	00	C2	05	0000	0101 0101
C114	32	STA C300	F4	00	02	00	00	C2	05	0000	0101 0101
C117	79	MOV A C	02	00	02	00	00	C2	05	0000	0101 0101
C118	32	STA C301	02	00	02	00	00	C2	05	0000	0101 0101
C11B	76	HLT	02	00	02	00	00	C2	05	0000	0101 0101

FLAG WORD

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

EXECUTION 2

```
C200 03 ; Number of input data
C201 B2 ; Input data
C202 FE ; Input data
C203 1C ; Input data
C300 CC ; Sum(Output)
C301 01 ; Carry(Output)
```

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
C100	21	LXI H C200	00	00	00	00	00	C2	00	0000	0000 0000
C103	46	MOV B M	00	03	00	00	00	C2	00	0000	0000 0000
C104	0E	MVI C 00	00	03	00	00	00	C2	00	0000	0000 0000
C106	97	SUB A	00	03	00	00	00	C2	00	0000	0100 0101
C107	23	INX H	00	03	00	00	00	C2	01	0000	0100 0101
C108	7E	MOV A M	B2	03	00	00	00	C2	01	0000	0100 0101
C109	05	DCR B	B2	02	00	00	00	C2	01	0000	0001 0001
C10A	23	INX H	B2	02	00	00	00	C2	02	0000	0001 0001
C10B	86	ADD M	B0	02	00	00	00	C2	02	0000	1001 0001
C10C	D2	JNC C110	B0	02	00	00	00	C2	02	0000	1001 0001
C10F	0C	INR C	B0	02	01	00	00	C2	02	0000	0000 0001
C110	05	DCR B	B0	01	01	00	00	C2	02	0000	0001 0001
C111	C2	JNZ C10A	B0	01	01	00	00	C2	02	0000	0001 0001
C10A	23	INX H	B0	01	01	00	00	C2	03	0000	0001 0001
C10B	86	ADD M	CC	01	01	00	00	C2	03	0000	1000 0100
C10C	D2	JNC C110	CC	01	01	00	00	C2	03	0000	1000 0100
C110	05	DCR B	CC	00	01	00	00	C2	03	0000	0101 0100
C111	C2	JNZ C10A	CC	00	01	00	00	C2	03	0000	0101 0100
C114	32	STA C300	CC	00	01	00	00	C2	03	0000	0101 0100
C117	79	MOV A C	01	00	01	00	00	C2	03	0000	0101 0100
C118	32	STA C301	01	00	01	00	00	C2	03	0000	0101 0100
C11B	76	HLT	01	00	01	00	00	C2	03	0000	0101 0100

FLAG WORD

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

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