**WRITE AN ASSEMBLY LEVEL PROGRAM TO PERFORM ADDITION OF TWO 16-BIT NUMBERS USING 8085.**

**ALGORITHM:**

1. Start the microprocessor.
2. Get the 1st 8 bit in ‘C’ register (LSB) and 2nd 8 bit in ‘H’ register (MSB) of 16 bit number.
3. Save the 1st 16 bit in ‘DE’ register pair.
4. Similarly get the 2nd 16 bit number and store it in ‘HL’ register pair. Copy it in register D(for bubble sort(N-1) times required).
5. Get the lower byte of 1st number into ‘L’ register.
6. Add it with lower byte of 2nd number.
7. Store the result in ‘L’ register.
8. Get the higher byte of 1st number into accumulator.
9. Add it with higher byte of 2nd number and carry of the lower bit addition.
10. Store the result in ‘H’ register.
11. Store 16 bit addition value in ‘HL’ register pair.
12. Stop program execution

**PROGRAM**:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **ADDRESS** | **LABEL** | **OPCODE/OPERAND** | **COMMENTS** |  |  |  |
|  |  | MVI C,00 | C=00H |  |  |  |
|  |  | LHLD 4800 | HL, 1ST Number |  |  |  |
|  |  | XCHG | HL-DE |  |  |  |
|  |  | LHLD 4802 | HL-2ND Number |  |  |  |
|  |  | DAD D | Double addition DE + HL |  |  |  |
|  |  | JNC AHEAD | If Carry=0, Go to AHEAD |  |  |  |
|  |  | INR C | C=C+01 |  |  |  |
|  | AHEAD: | SHLD 4804 | HL-(Sum) |  |  |  |
|  |  | MOV C,A |  |  |  |  |
|  |  | STA 4806 | Carry |  |  |  |
|  |  | HLT | Stop |  |  |  |
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**OBSERVATION:**

**INPUT:**

|  |  |
| --- | --- |
| 4800 | 01(added) |
| 4801 | 04(added) |
| 4802 | 02(augend) |
| 4803 | 03(augend) |
|  |  |
|  |  |

**OUTPUT:**

|  |  |
| --- | --- |
| 4804 | 03(sum) |
| 4805 | 07(sum) |
| 4806 | 00(carry) |
|  |  |
|  |  |
|  |  |

Calculation:

04 01 = 0000 0100 0000 0001

+ 03 02 = 0000 0011 0000 0010

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07 03 = 0000 0111 0000 0011