CODE CONVERSIONS LECTURE 4

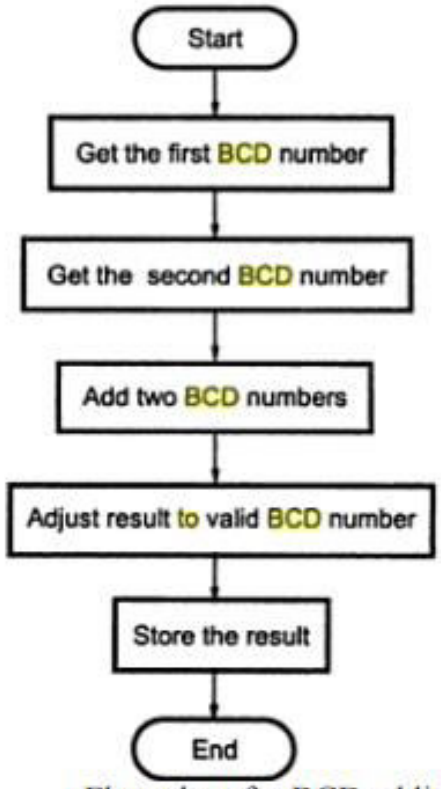
Dronacharya Group of Institutions

BCD ADDITION

PROBLEM STATEMENT: Add two 2-digit BCD numbers in memory location 2200H and 2201H and store the result in memory location 2300H.

PROGRAM:

```
LXI H,2200H
MOV A,M
INX H
ADD M
DAA
STA 2300H
HLT
```



Flow chart for BCD addition

EXAMPLE OF BCD ADDITION

PROBLEM STATEMENT: Add two 4 digits BCD numbers in HL and DE register pair and store the result in memory locations 2300H and 2301H. Ignore carry after 16 bit.

```
MOV A,L
ADD E
DAA
STA 2300H
MOV A,H
ADC D
DAA
STA 2301H
HLT
```

BCD SUBTRACTION

SUBTRACTION OF TWO BCD NUMBERS

PROBLEM STATEMENT: Subtract the BCD number stored in E register from the number stored in D register.
Process: (i) Find 100's compliment of subtrahend
(ii) Add two numbers using BCD addition

```
MVI A,99H
SUB E
INR A
ADD D
DAA
HLT
```

ADVANCED INSTRUCTIONS

1. **LHLD Address(16 bit)-** This instruction is used to load the contents of memory location given within the instruction into L register and the contents of memory location next to it will be stored in H register. Example: LHLD 5000H- It will load the contents of memory location 5000H into L register and the contents of memory location 5001H will be stored in H register.

2. **SHLD Address(16 bit)-** This instruction will store the contents of L register into the memory address as specified within the instruction and store the contents of H register into memory location next to it. Example: SHLD 5000H- This instruction will store the contents of L register into the memory address 5000 and store the contents of H register into memory location 5001.

3. XCHG- This instruction is used to exchange the contents of HL register pair with the contents of DE register pair.

ADVANCED INSTRUCTIONS

4. **XTHL-** This instruction is used to exchange the contents of HL register pair with the contents of top of stack.
5. **SPHL-** This instruction is used to copy the contents of HL register pair into top of stack.
6. **PCHL-** This instruction is used to copy the contents of HL register pair into program counter.
7. **ADC R-** This instruction is used to add the contents of accumulator with the contents of specified register and carry and store the result in accumulator.
8. **ADC M-** This instruction is used to add the contents of accumulator with the contents of memory location as pointed by HL register pair and carry and store the result in accumulator.

ADVANCED INSTRUCTIONS

9.ACI Data- This instruction is used to add the contents of accumulator with the immediate data given within the instruction and carry and store the result in accumulator.

10.SBB R- This instruction is used to subtract the contents of specified register from the contents of accumulator and carry and store the result in accumulator.

11.SBB M- This instruction is used to subtract the contents of memory location as pointed by HL register pair from the contents of accumulator and carry and store the result in accumulator.

12.SBI data- This instruction is used to subtract the contents of immediate data given within the instruction from the contents of accumulator and carry and store the result in accumulator.