

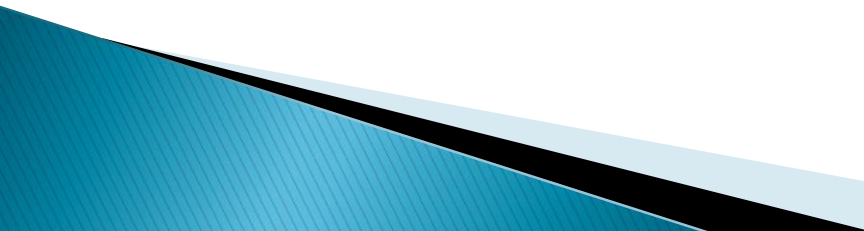
Arithmetic Instruction Set

All the instructions are performed in ALU (Arithmetic Logic Unit). In most of the operations, first data comes from the accumulator and then execution of the program takes place in ALU and the result is automatically stored in the accumulator and its status is saved in the Flag register. In 8085, no instruction is made for multiplication. Repetitive addition is performed for multiplication.

ADD R Add register R data with accumulator data.
Register Direct Addressing Mode.
It is single Byte Instruction.
All flags are affected.

ADD M Add Memory data.
Register Indirect Addressing Mode.
It is single Byte Instruction.
All flags are affected.

ADI data(8-bit) Add immediate data.
Immediate Addressing Mode.
It is double Byte Instruction.
All flags are affected.



ADC R Add register R data with accumulator data with carry flag.

Register Direct Addressing Mode.

It is single Byte Instruction.

All flags are affected.

ADC M Add Memory data with carry flag.

Register Indirect Addressing Mode.

It is single Byte Instruction.

All flags are affected.

ACI data(8-bit) Add immediate data with carry flag.

Immediate Addressing Mode.

It is double Byte Instruction.

All flags are affected.

DAA Decimal Adjuster Accumulator.

This instruction is used for Addition of decimal number. After the addition of two decimal numbers if sum of first four LSB's is greater than 9 or auxiliary carry is 1 then 6 (0110) is added with four LSB's and if after the addition of four MSB's the sum is greater than 9 or final carry is 1 then 6 (0110) is added with four MSB's otherwise 0 (0000) is added with 4 LSB's as well as 4 MSB's.

Implicit Addressing Mode

Single Byte Instruction

DAD Rp Double addition register pair Rp data.

This instruction is used for addition of two 16 bit numbers. First data from register pair HL and second data from any register pair such as BC, DE and HL. After the addition the result will be automatically stored in HL pair. Only carry flag will be affected after execution of DAD Rp.

Register Direct Addressing Mode

Only Carry Flag is affected

SUB R Subtract register R data.

Register Direct Addressing Mode.

It is single Byte Instruction.

All flags affected.

SUB M Subtract memory data.

Register Indirect Addressing Mode.

It is single Byte Instruction.

All flags affected.

SUI data(8-bit) Subtract immediate data.

Immediate Addressing Mode.

It is Double Byte Instruction.

All flags affected.

SBB R Subtract with borrow register R data.

Register Direct Addressing Mode.

It is single Byte Instruction.

All flags affected.

SBB M Subtract with borrow memory data.

Register Indirect Addressing Mode.

It is single Byte Instruction.

All flags affected.

SBI data(8-bit) Subtract with borrow immediate data.

Immediate Addressing Mode.

It is Double Byte Instruction.

All flags affected.

CMP R Compare register R data with accumulator. It does not store result in accumulator . Result not shown rather it shows the status in flag register.

- ▶ IF Reg A > Reg R Then CF= 0 , Z=0
 - ▶ IF Reg A = Reg R Then CF= 0 , Z=1
 - ▶ IF Reg A < Reg R Then CF= 1 , Z=0
- # Register Direct Addressing Mode
Single Byte Instruction
All Flags are affected

CMP M Compare memory data with accumulator.

- ▶ IF Reg A > M Then CF= 0 , Z=0
 - ▶ IF Reg A = M Then CF= 0 , Z=1
 - ▶ IF Reg A < M Then CF= 1 , Z=0
- # Register Indirect Addressing Mode
Single Byte Instruction
All Flags are affected

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CPI data(8-bit) Compare accumulator with immediate data

- ▶ IF Reg A > Data Then CF= 0 , Z=0
 - ▶ IF Reg A = Data Then CF= 0 , Z=1
 - ▶ IF Reg A < Data Then CF= 1 , Z=0
- # Immediate Addressing Mode
- # Double Byte Instruction
- # All Flags are affected

INR R Increment Register R data by 1.

Register Direct Addressing Mode

Single Byte Instruction

Expect Carry Flag, all flags are affected

INR M Increase memory data by 1.

Register Indirect Addressing Mode

Single Byte Instruction

Expect Carry Flag, all flags are affected

INX Rp Increase register pair Rp data by 1.

Register Direct Addressing Mode

Single Byte Instruction

No Flags are affected

DCR R Decrement Register R data by 1.

Register Direct Addressing Mode

Single Byte Instruction

Expect Carry Flag, all flags are affected

DCR M Decrease memory data by 1.

Register Indirect Addressing Mode

Single Byte Instruction

Expect Carry Flag, all flags are affected

DCX Rp Decrease register pair Rp data by 1.

Register Direct Addressing Mode

Single Byte Instruction

No Flags are affected