Code-Conversion-Using-8085

Aim:

To write 8085 microprocessor programs for converting:

- 1. Hexadecimal to ASCII
- 2. ASCII to Hexadecimal

Apparatus Required:

Laptop with an internet connection

Program 1: Hexadecimal to ASCII Conversion

Algorithm:

- 1. Load the hexadecimal number from memory location 4200H.
- 2. Mask the upper nibble and check if it is less than 10H.
- 3. If it is less than 10H, add 30H to convert it to ASCII.
- 4. If it is greater than 10H, add 37H to convert it to ASCII.
- 5. Repeat the process for the lower nibble.
- 6. Store the ASCII equivalent in memory location 4300H and 4301H.

Program:

ORG 00H

; Input : Port 00H (Hexadecimal number)

; Output: Port 01H (ASCII of upper nibble)

; Port 02H (ASCII of lower nibble)

MVI A, 00H

IN 00H ; Read hexadecimal number

MOV B, A ; Save a copy of original number

ANI 0F0H ; Mask lower nibble

RRC

RRC

RRC

RRC ; Move upper nibble to lower position

CPI 0AH ; Compare with 0AH

JC ADD30U ; If less than 0AH, jump

ADI 37H; Add 37H for A-F

JMP STORE1

ADD30U: ADI 30H; Add 30H for 0-9

STORE1: OUT 01H; Send upper nibble ASCII to port 01H

; Process lower nibble

MOV A, B ; Get original number

ANI 0FH ; Mask upper nibble

CPI 0AH ; Compare with 0AH

JC ADD30L ; If less, jump

ADI 37H ; Add 37H for A-F

JMP STORE2

ADD30L: ADI 30H; Add 30H for 0-9

STORE2: OUT 02H; Send lower nibble ASCII to port 02H

HLT ; Stop program

END

Output:

Input Ports (numbers are read from these ports):

00H → Input hexadecimal number

Output Ports (results are displayed on these ports):

01H → ASCII of upper nibble

02H → ASCII of lower nibble

Program 2: ASCII to Hexadecimal Conversion

Algorithm:

- 1. Load the first ASCII digit from memory location 4200H.
- 2. Convert it to hexadecimal by subtracting 30H (if it's a number) or 37H (if it's a letter A-F).
- 3. Load the second ASCII digit from memory location 4201H and repeat the process.
- 4. Combine the upper and lower nibbles to form a hexadecimal number.
- 5. Store the result in memory location 4300H.

Program:

ORG 00H

; Input : Port 00H → ASCII of upper nibble

; Port $01H \rightarrow ASCII$ of lower nibble

; Output: Port 02H → Combined hexadecimal number

; --- Convert upper ASCII nibble to HEX ---

IN 00H ; Read upper ASCII digit

CPI 3AH ; Compare with '9'+1 (3AH)

JC SUB30U ; If less than 3AH, it's 0-9

SUI 37H ; Else subtract 37H for A–F

JMP STOREU

SUB30U: SUI 30H; Subtract 30H for 0-9 conversion

STOREU: MOV C, A; Store upper nibble in C

; --- Convert lower ASCII nibble to HEX ---

IN 01H ; Read lower ASCII digit

CPI 3AH ; Compare with '9'+1 (3AH)

JC SUB30L ; If less than 3AH, it's 0–9

SUI 37H ; Else subtract 37H for A-F

JMP STOREL

SUB30L: SUI 30H; Subtract 30H for 0-9 conversion

STOREL: MOV B, A; Store lower nibble in B

; --- Combine upper and lower nibbles ---

MOV A, C ; Get upper nibble

RLC ; Shift left 4 times

RLC

RLC

RLC

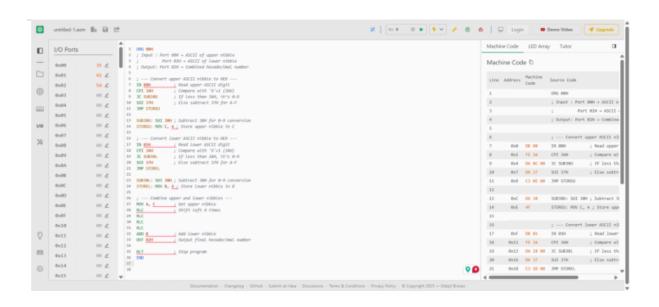
ADD B ; Add lower nibble

OUT 02H ; Output final hexadecimal number

HLT ; Stop program

END

Output:



Input Ports:

 $00H \rightarrow ASCII$ of upper nibble

 $01H \rightarrow ASCII$ of lower nibble

Output Port:

02H → Hexadecimal number (combined 8-bit value)

Result:

The 8085 microprocessor successfully converts hexadecimal numbers to ASCII and vice versa, storing the results in memory.