DEPT. OF ELECTRICAL & ELECTRONICS ENGINEERING
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Title of Experiment	: **BCD TO HEX CODE CONVERSION**
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Register Number	:RA1811005010278
Date of Experiment	:12/02/2021
Date of submission	**:12/02/2021**

S.NO :	**MARKS SPLIT UP**	**MAXIMUM MARKS (50)**	**MARKS OBTAINED**
1	PRE LAB	5	
2	PROGRAM	25	
3	EXECUTION	15	
4	POST LAB	5	
TOTAL		50	

Staff Signature

4. BCD TO HEX CODE CONVERSION

PRE-LAB

1. **What is tri-state logic?**

   3-state logic allows an output or input pin/pad to assume a high impedance state, effectively removing the output from the circuit, in addition to the 0 and 1 logic levels. This allows multiple circuits to share the same output line or lines.

2. **Define maskable and non-maskable.**

   Maskable interrupt is a hardware Interrupt that can be disabled or ignored by the instructions of the CPU. A non-maskable interrupt is a hardware interrupt that cannot be disabled or ignored by the instructions of the CPU. ... Maskable interrupts help to handle lower priority tasks.

3. **What is meant by memory mapping?**

   Image result for What is meant by memory mapping

   Memory-mapping is a mechanism that maps a portion of a file, or an entire file, on disk to a range of addresses within an application's address space. The application can then access files on disk in the same way it accesses dynamic memory.

4. **Define interrupt.**

In digital computers, an interrupt is a response by the processor to an event that needs attention from the software. An interrupt condition alerts the processor and serves as a request for the processor to interrupt the currently executing code when permitted, so that the event can be processed in a timely manner.

5. **What is Polling? What are the different types of Polling?**

In polling is not a hardware mechanism, it's a protocol in which the CPU steadily checks whether the device needs attention. Wherever the device tells the process unit that it desires hardware processing, the polling process unit keeps asking the I/O device whether or not it desires CPU processing. The CPU ceaselessly checks every and each device hooked up thereto for sleuthing whether or not any device desires hardware attention.

4. BCD TO HEX CODE CONVERSION

Aim:

Write an assembly language program to convert a BCD to its HEX code and display the result in the address field.

Hardware Requirement:

8051 microcontroller kit, Power Supply

Software Requirement :

8051 EdSim

BCD To Hexadecimal Conversion

Binary coded decimal (BCD) is a system of writing numerals that assigns a four-digit binary code to each digit 0 through 9 in a decimal (base-10) numeral. The hexadecimal number system (also called base-16) is a number system that uses 16 unique symbols to represent a particular value. Those symbols are 0-9 and A-F.

BCD number to be converted is brought to the accumulator. Mask the lower order nibble using ANL instruction and swap their nibbles using SWAP instruction. Store the resultant value in any registers. Then multiply the result with 10 Decimal. Mask the higher order nibble and the result is added with the result obtained from above multiplication. Finally, the result is stored in memory.

The Hexadecimal number system (also called base-16) is a number system that uses 16 unique symbols to represent a particular value. Those symbols are 0-9 and A-F. In this program, the hex number is converted to its equivalent BCD number. The hex number to be converted is brought to the accumulator and is divided by 100 D i.e 64. DIV instruction of 8051 is used in this program. The remainder is now divided by 10 D. Swap the quotient and add the result with remainder obtained from above division. Finally, the result is stored in memory.

Program: BCD TO HEXADECIMAL

ADDRESS	LABEL	MNEMONICS	OPCODE	COMMENTS
0000		MOV A,30H		**TAKE VALUE**
0002		MOV R5, A		**TAKE VALUE**
0003		ANL A, #0F0H		**ACCUMULATOR**
0005		SWAP A		**SWAP LOCATION VALUE**
0006		MOV R1, A		**STORE**

0007		MOV A, R5		**STORE**
0008		ANL A, #0FH		**ACCUMULATOR**
000A		MOV R2, A		**STORE**
000B		MOV A, R1		**STORE**
000C		MOV B, #0AH		**STORE TO B**
000F		MUL AB		**MULTIPLY A & B**
0010		ADD A, R2		**ADD VALUE**
0010		MOV 31H, A		**MOVE TO 31H**
0013		JMP $		**EXECUTE**

SAMPLE INPUT AND OUTPUT:

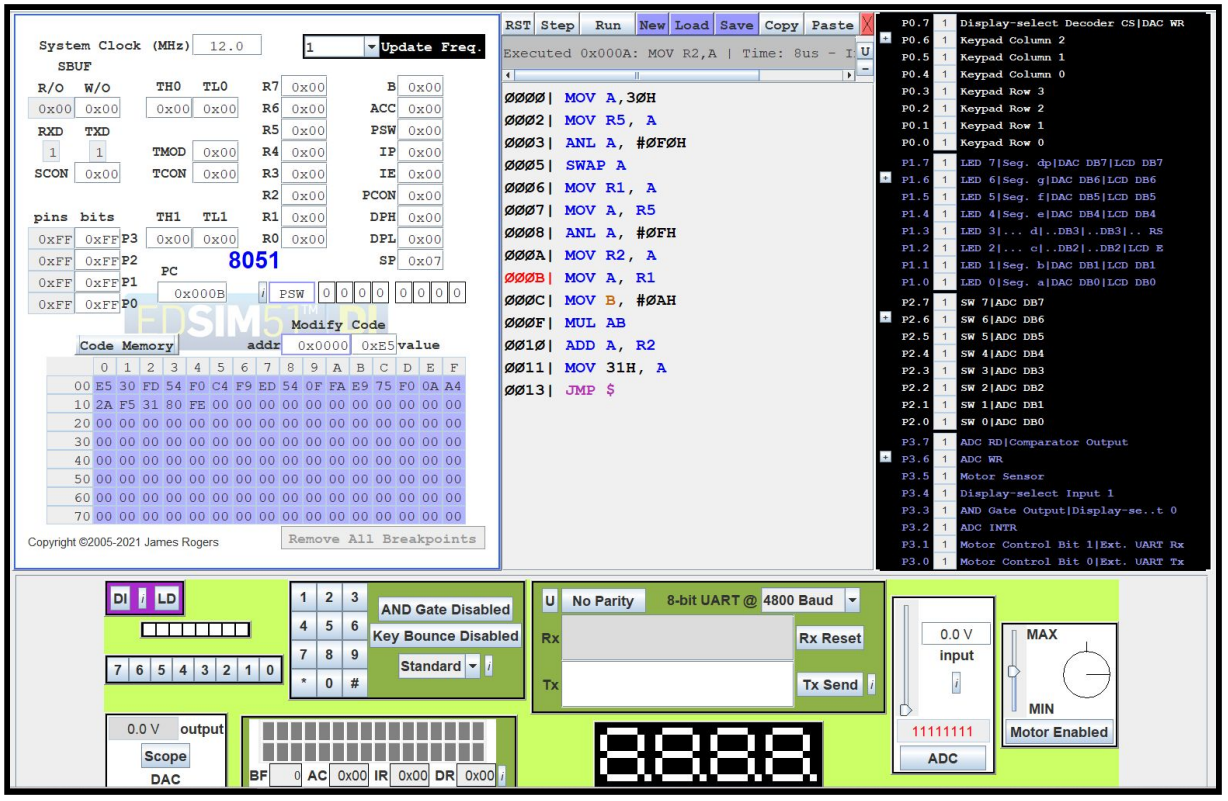
INPUT:

Memory address	Data
0000	BCD = 01001000

OUTPUT:

Memory address	Data
0xE5	HEX = 30

SIMULATION :



Result: Thus, the assembly language program was written to convert BCD TO HEX code and executed using an 8051 microcontroller.

POST LAB

1. **Distinguish between Microprocessor and Microcontroller?**

   Microprocessor consists of only a Central Processing Unit, whereas a Micro Controller contains a CPU, Memory, I/O all integrated into one chip. ... Microprocessor uses an external bus to interface to RAM, ROM, and other peripherals, on the other hand, Microcontroller uses an internal controlling bus

2.Define stack pointer.

A stack register is a computer central processor register whose purpose is to keep track of a call stack. On an accumulator-based architecture machine, this may be a dedicated register such as SP on an Intel x86 machine

3**.What is PUSH and POP instruction? Give example**

The easiest and most common way to use the stack is with the dedicated "push" and "pop" instructions. "push" stores a constant or 64-bit register out onto the stack. ... ("push eax" gives an error "instruction not supported in 64-bit mode"; use "push rax" instead.) "pop" retrieves the last value pushed from the stack

4.What are the special function registers available in 8051 microcontrollers?

Categories of 8051 Microcontroller Special Function Registers. ...

TCON (Timer Control) ...

TMOD (Timer Mode) ...

IE (Interrupt Enable) ...

IP (Interrupt Priority) ...

SBUF (Serial Data Buffer) ...

TL0/TH0 (Timer 0 Low/High) ...

TL1/TH1 (Timer 1 Low/High)

5.What are the addressing modes of 8051?

immediate AddressingMode.

Register AddressingMode.

Direct AddressingMode.

Register IndirectAddressing Mode.

Indexed AddressingMode.

Implied AddressingMode.