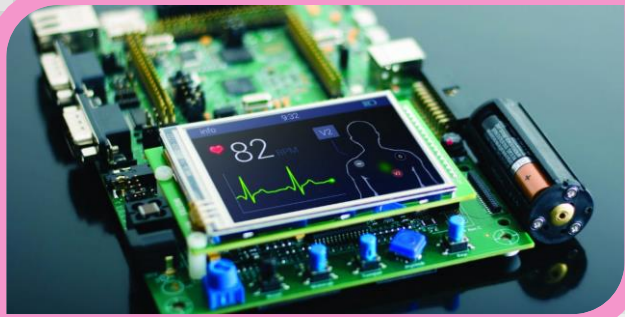


# Embedding the world with Embedded Systems

A Hands on training on 8051 Microcontroller



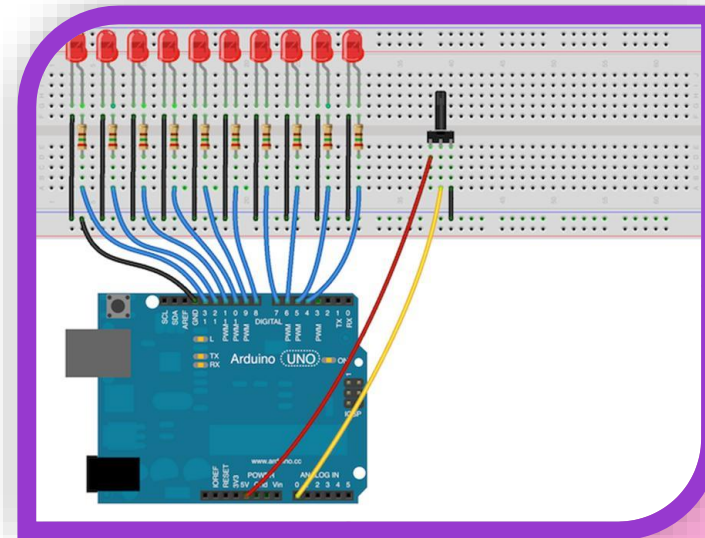
Session Expert  
Mr.Ganesh R, Hardware Engineer, Microchip

**RMK COLLEGE OF  
ENGINEERING AND TECHNOLOGY**

RS.M NAGAR, PUDUVOYAL – 601 206, GUMMIDIPOONDITALUK, TIRUVALLUR DIST



**DEPARTMENT OF  
ELECTRICAL & ELECTRONICS ENGINEERING**



# Objective

- ▶ Introduction to 8051 Microcontroller
- ▶ Comparison of block diagram with Edsim51 simulator
- ▶ Execution of Instructions
- ▶ Knowledge Check with [www.menti.com](http://www.menti.com)



# Invitation & Agenda

## Program Schedule

**RMK COLLEGE OF  
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**DEPARTMENT OF  
ELECTRICAL & ELECTRONICS ENGINEERING**

**Organizing  
Webinar on**

**Embedding the World  
With Embedded Systems**

**DATE: 23.05.2020**

**Expert on Session  
Mr. R. Ganesh**  
Hardware Engineer, Microchip, Chennai

**CONVENOR  
Dr.N.KALAIARASI**  
Professor & Head  
EEE

**CO-ORDINATORS  
MR.GUNALAN K  
DR.CATHERINE T J  
MR.HARIHARAN N**

**STAY HOME STOP COVID 19 STAY SAFE**

Program Schedule	
Welcome Address:	Mr.Hariharan N AP/EEE
Introduction about Session Expert	Mr.Gunalan K ASP/EEE
Key note Speaker :	Mr.Ganesh R Hardware Engineer, Microchip, Chennai
Felicitation by:	Dr.Kalaiarasi N HOD/EEE
Vote of Thanks	: Dr.Catherine T J ASP/EEE

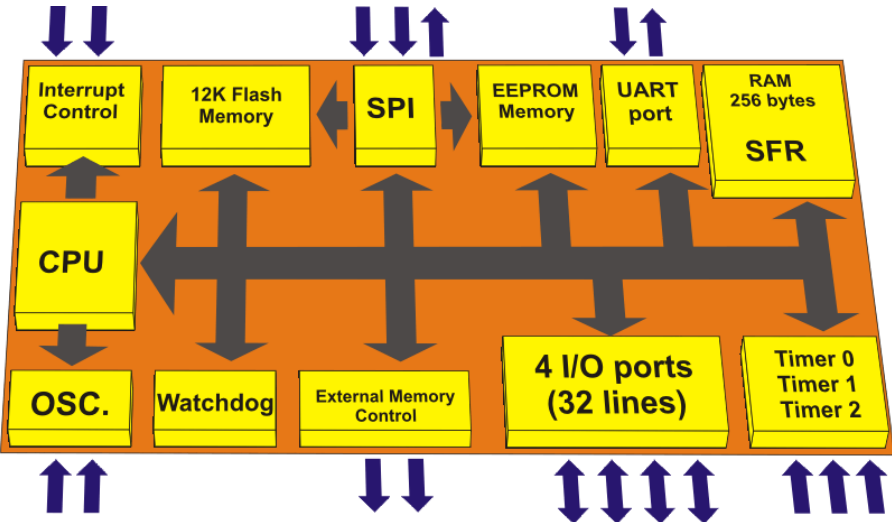
# Introduction to Microcontroller

- ▶ Microcontroller is an electronic device belonging to the microcomputer family. These are fabricated using the VLSI technology on a single chip. There are microcontrollers available in the present market with different word length starting from 4 bit, 8 bit, 64 bit to 128 bit

## Microcontroller

- ▶ In a broader sense, the components which constitute a microcontroller are the memory, peripherals and most crucially a processor. Microcontrollers are present in devices where the user has to exert a degree of control. They are designed and implemented to execute a specific function such as displaying integers or characters on an LCD display module of a home appliance. Application of microcontrollers is myriad. In simpler terms, any gadget or equipment which has to deal with the functions such as measuring, controlling, displaying and calculating the values consist of a microcontroller chip inside it. They are present in almost all the present day home appliances, toys, traffic lights, office instruments and various day-to-day appliances.

# Comparison of block diagram with Edsim51 simulator



The screenshot shows the Edsim51 simulator interface. The main window displays the assembly code for the 8051 microcontroller. The code includes instructions such as MOV TL0, #-50, SETB TR0, SETB ET0, SETB EA, and JMP \$, along with comments in Chinese. The simulator also shows the register file, data memory, and a control panel at the bottom with various settings and a digital display.

R/O	W/O	TH0	TL0	R7	0x00	B	0x00
0x00	0x00	0xCE	0xE2	R6	0x00	ACC	0x00
				R5	0x00	PSW	0x00
RXD	TXD	TMOD	0x02	R4	0x00	IP	0x00
1	1			R3	0x00	IE	0x83
SCON	0x00	TCON	0x11	R2	0x00	PCON	0x00
				R1	0x00	DPH	0x00
				R0	0x00	DPL	0x00
						SP	0x07
						PSW	00000000

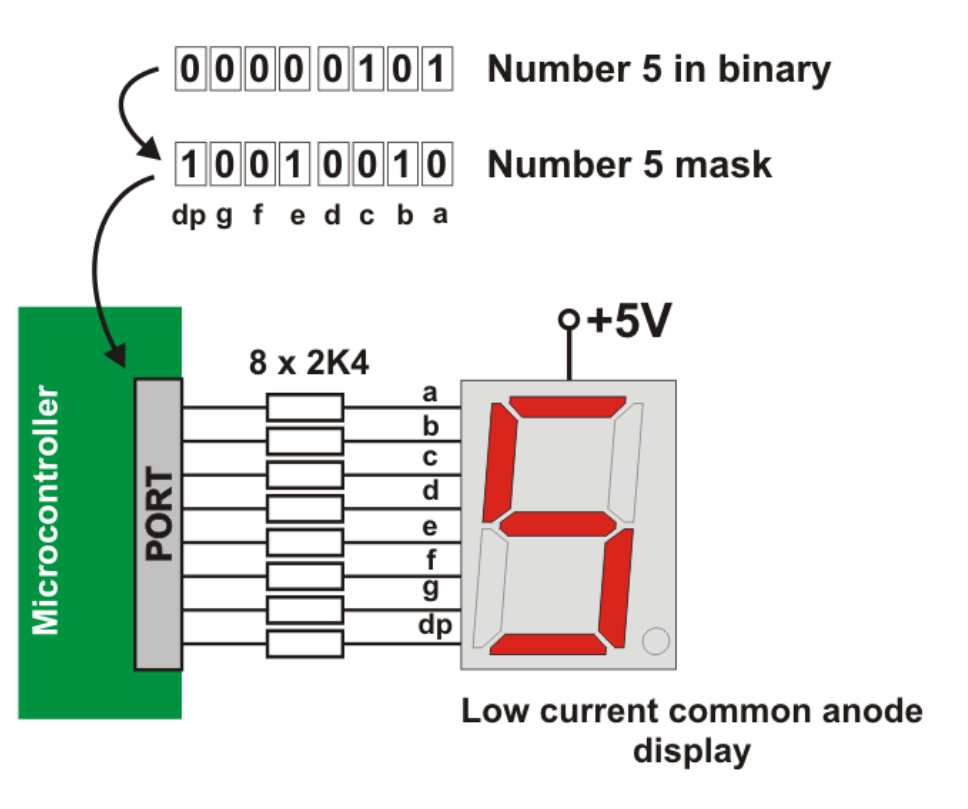
addr	0x00	0x00	value
0	00	00	00
1	00	00	00
2	00	00	00
3	00	00	00
4	00	00	00
5	00	00	00
6	00	00	00
7	00	00	00
8	00	00	00
9	00	00	00
A	00	00	00
B	00	00	00
C	00	00	00
D	00	00	00
E	00	00	00
F	00	00	00

Here block diagram components are compared with simulator

# Execution of Instructions

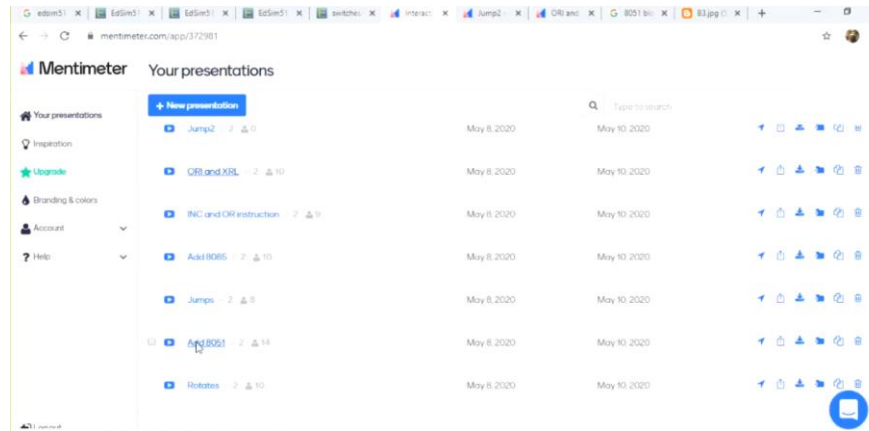
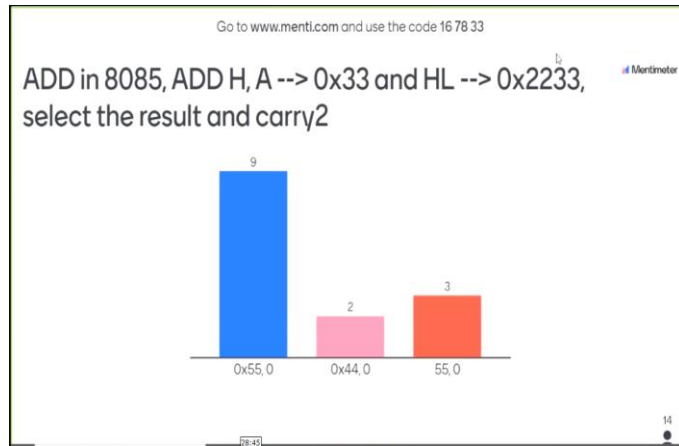
## 8051 instruction set

<i>DATA TRANSFER</i>	<i>ARITHMETIC</i>	<i>LOGICAL</i>	<i>BOOLEAN</i>	<i>PROGRAM BRANCHING</i>
MOV	ADD	ANL	CLR	LJMP
MOVC	ADDC	ORL	SETB	AJMP
MOVX	SUBB	XRL	MOV	SJMP
PUSH	INC	CLR	JC	JZ
POP	DEC	CPL	JNC	JNZ
XCH	MUL	RL	JB	CJNE
XCHD	DIV	RLC	JNB	DJNZ
	DAA	RR	JBC	NOP
		RRC	ANL	LCALL



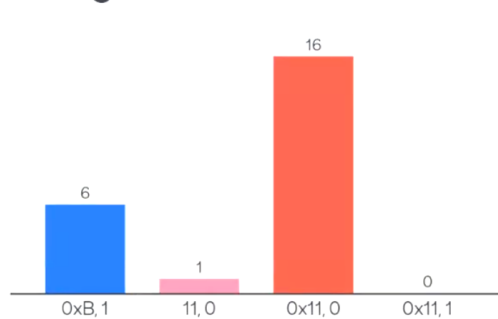
Explains how instructions are executing in microcontroller

# Knowledge Check With WWW.Menti.com



Go to [www.menti.com](http://www.menti.com) and use the code 53 22 65

ADD instruction, guess value at A and Carry bit



- Here speaker introduced a platform called Menti.com, where question can be posted online and students answer can be viewed in live
- This is very interactive with students



# Thank You

Watch the Video here

<https://www.youtube.com/watch?v=QAni93aVeXY&t=416s>