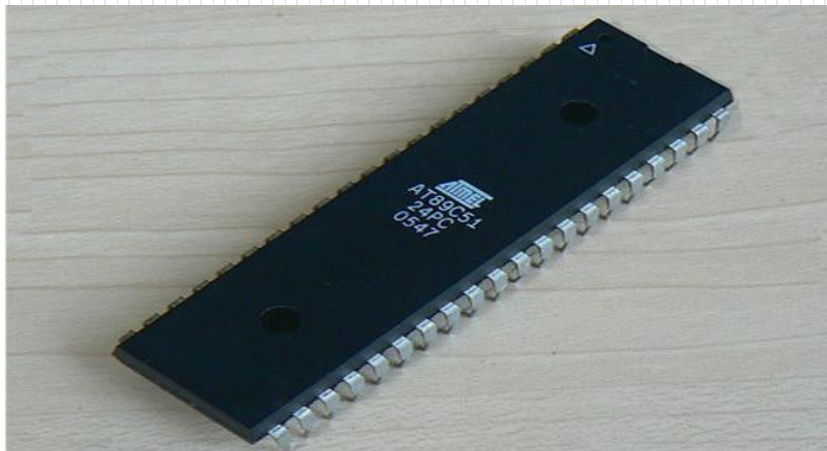


MICROCONTROLLER & ITS INTERFACING



Topics of Discussion:

❖ Microprocessor

- Definition
- Working
- Microprocessor & Human Behaviour

❖ Microcontroller 8051

- Definition
- Microprocessor Vs Microcontroller
- 8051 Features

Topics of Discussion:

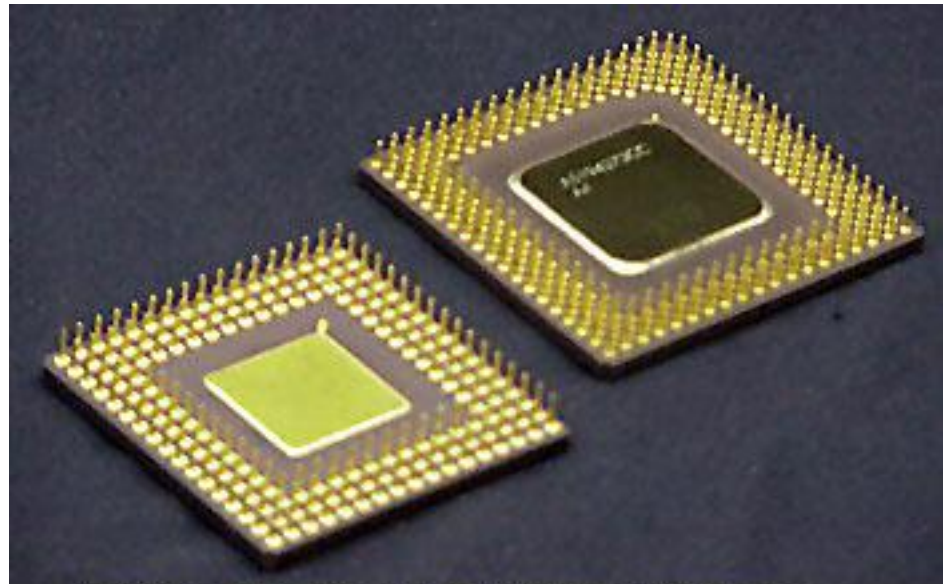
- Block Diagram of 8051
- Manufacturers
- Pin diagram of 8051
- Addressing Modes
- How to write program
- ❖ **Real World Interfacing**
- Simple I/O concept
- LCD Interfacing

Topics of Discussion:

- ADC0804 Interfacing
- Relay Interfacing
- Stepper Motor Interfacing
- DC Motor Interfacing
- ❖ Applications of 8051
- ❖ Queries

Microprocessor:

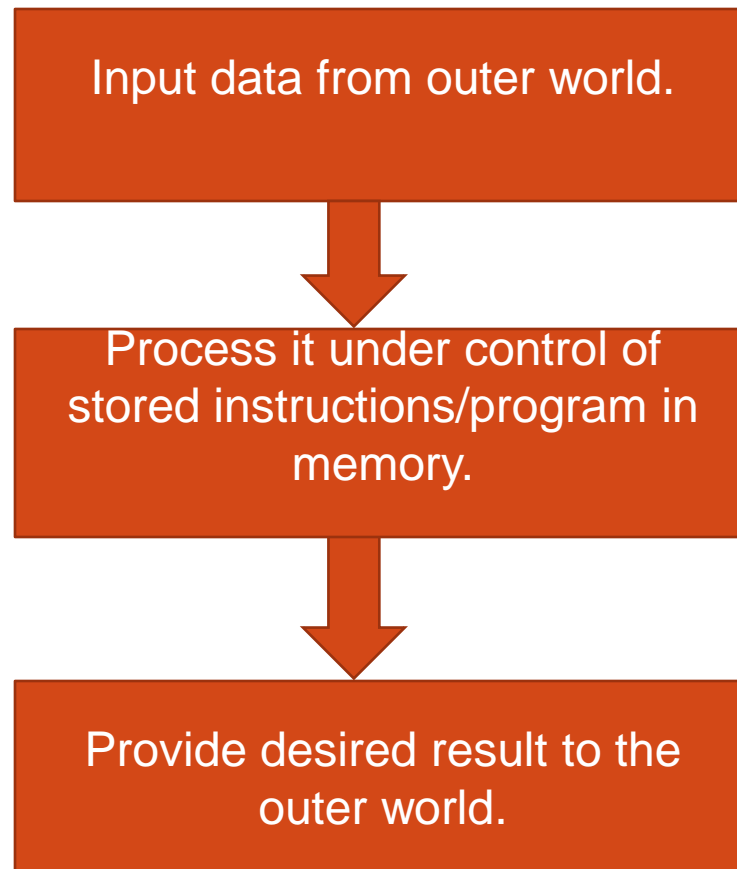
- Multipurpose
- Re-Programmable
- Digital Device
- Semiconductor IC



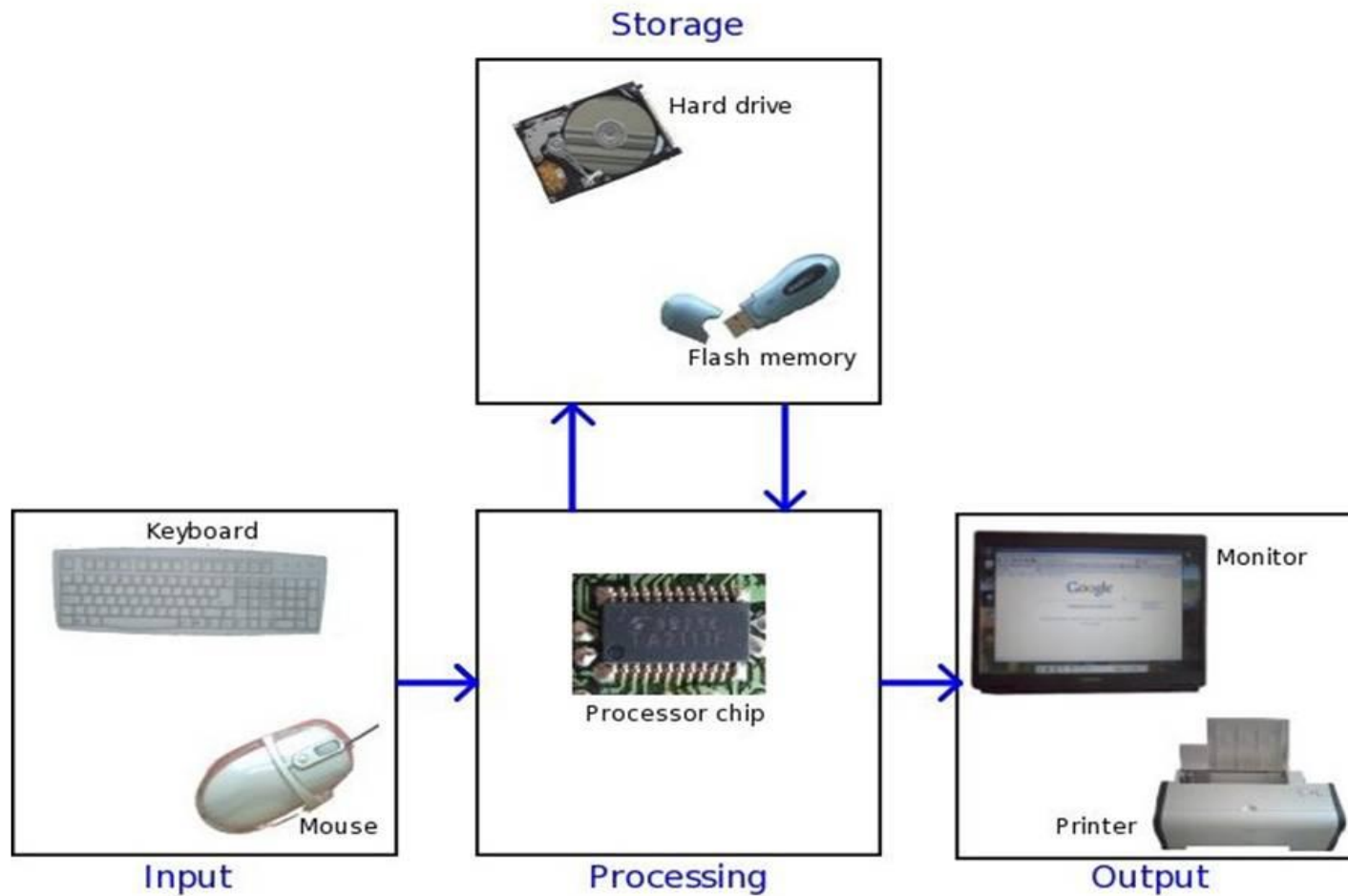
Intel 486 and Pentium in Pin Grid Array (PGA) package

Microprocessor (cont.):

- Works On:



Microprocessor(cont.):



Microprocessor & Human Behaviour:



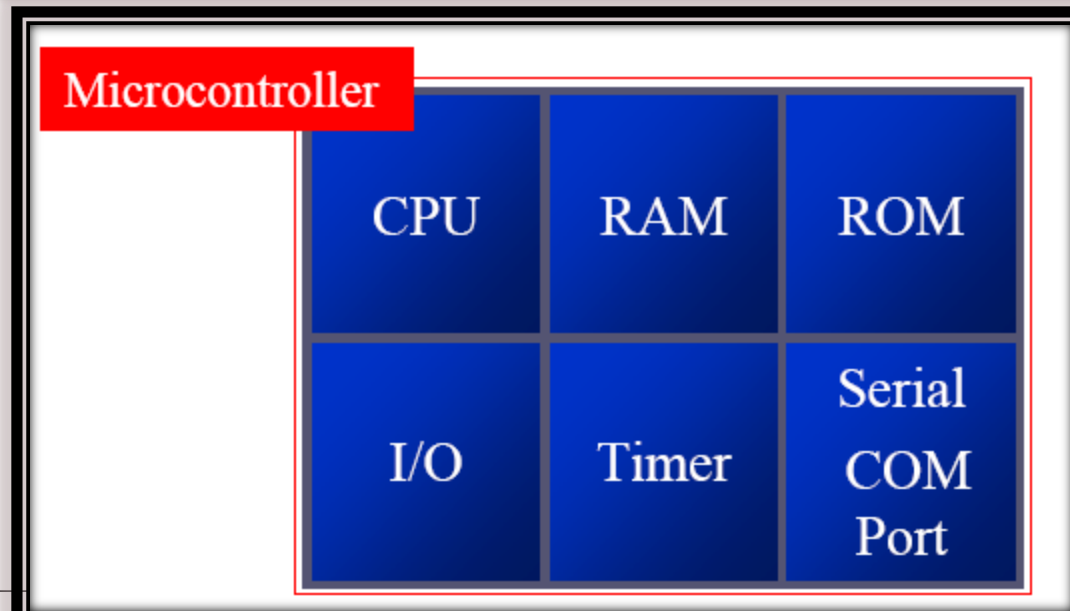
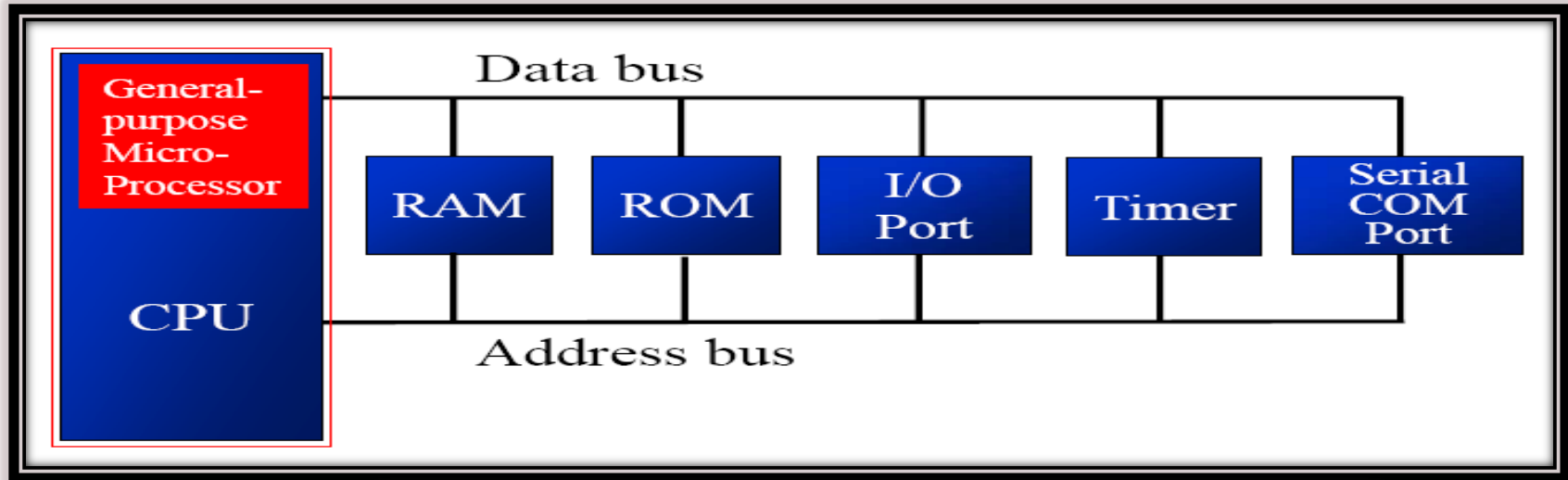
Microcontroller:

- ❖ Introduced in 1981 by Intel Corporation.
- ❖ Microcontroller is a programmable digital processor with necessary peripherals.
- ❖ Both microcontrollers and microprocessors are complex sequential digital circuits meant to carry out job according to the program / instructions.



Swiss Knife

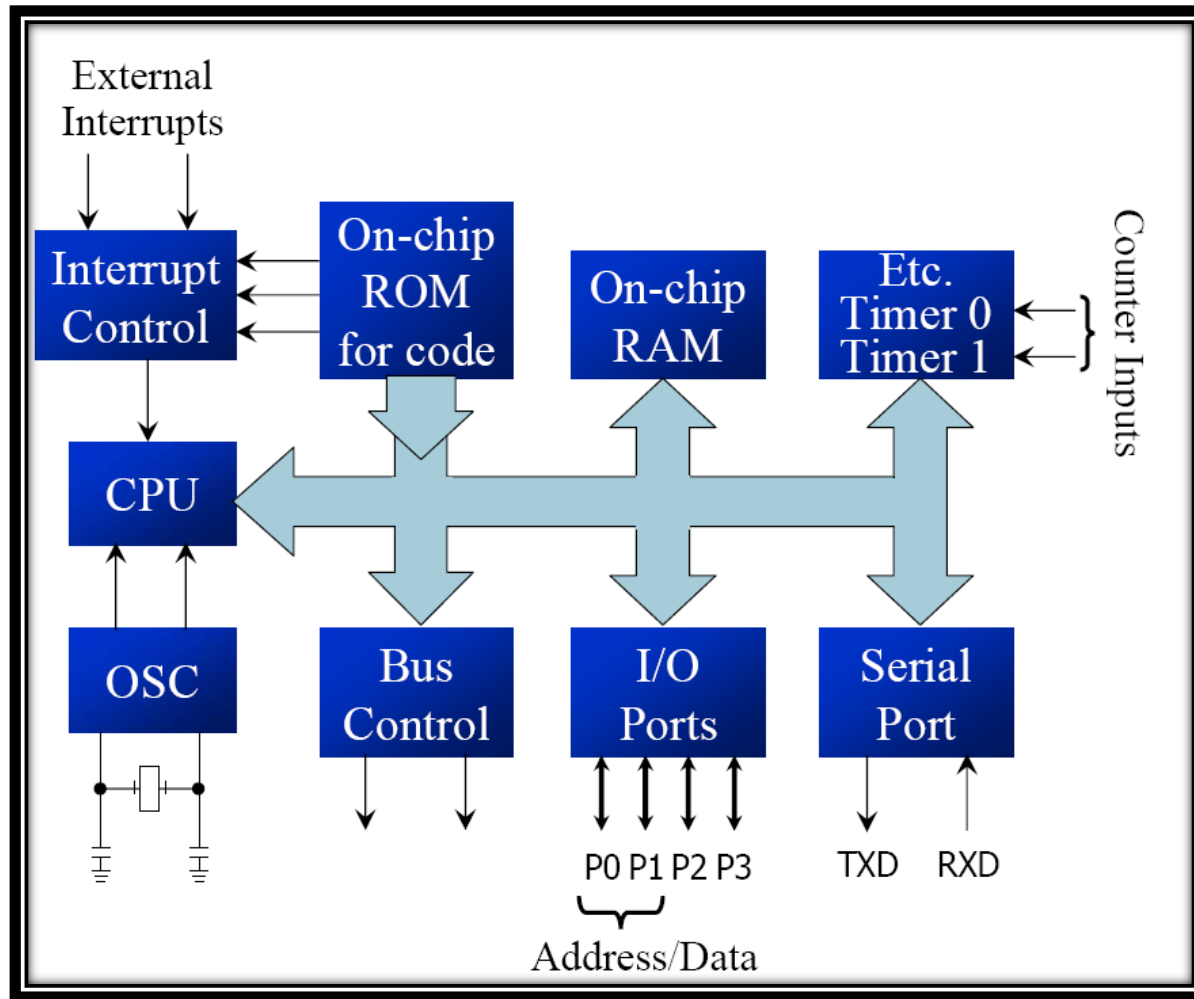
Microprocessor Vs Microcontroller:



Microcontroller 8051 Features:

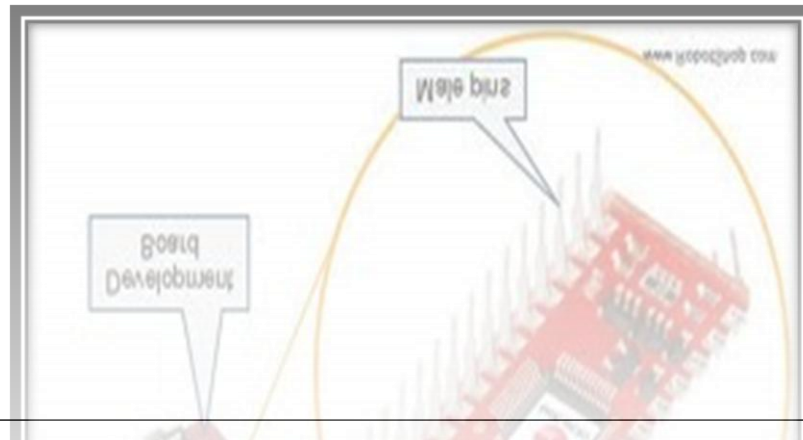
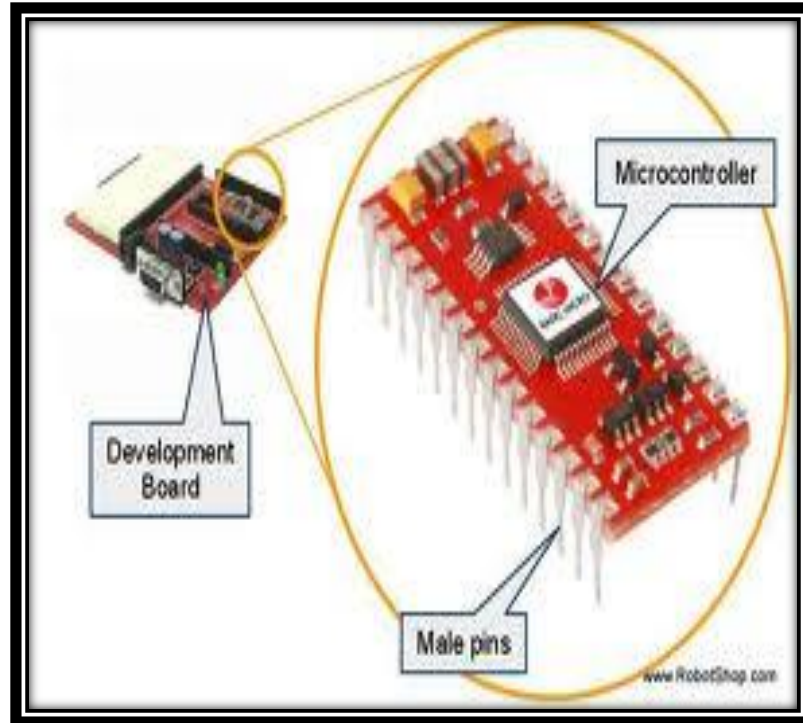
Feature	8051	8052	8031
ROM (on-chip program space in bytes)	4K	8K	0K
RAM (bytes)	128	256	128
Timers	2	3	2
I/O pins	32	32	32
Serial port	1	1	1
Interrupt sources	6	8	6

8051 Block Diagram:

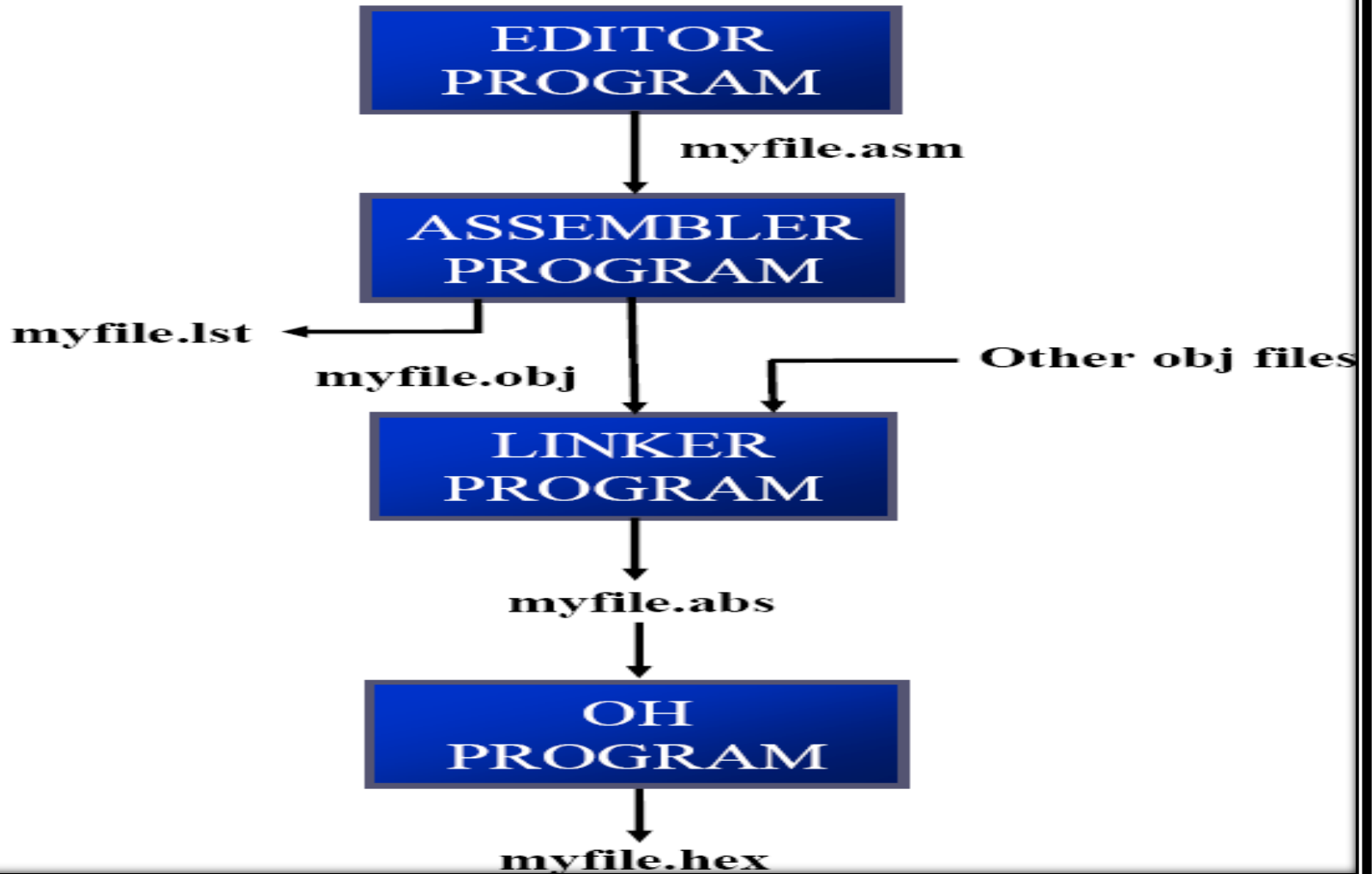


Manufacturers of 8051:

- Intel
- Atmel
- Phillips
- Dallas
- Motorola
- National
- Infineon



How to Write Program:



Real World Interfacing:

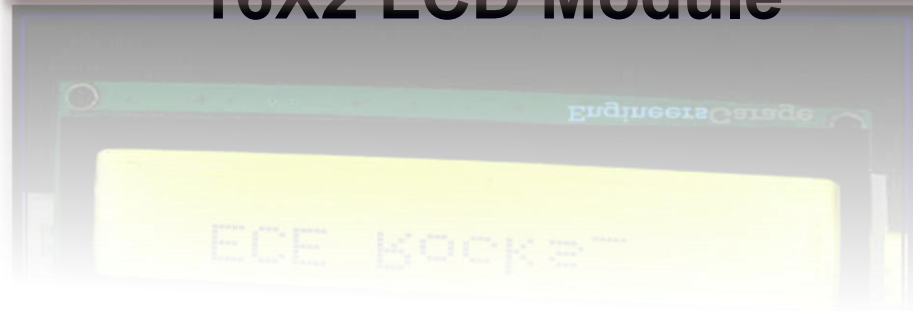
Simple Input- Output Concept:

- Interfacing Switch
- Interfacing LED

LCD Interfacing:



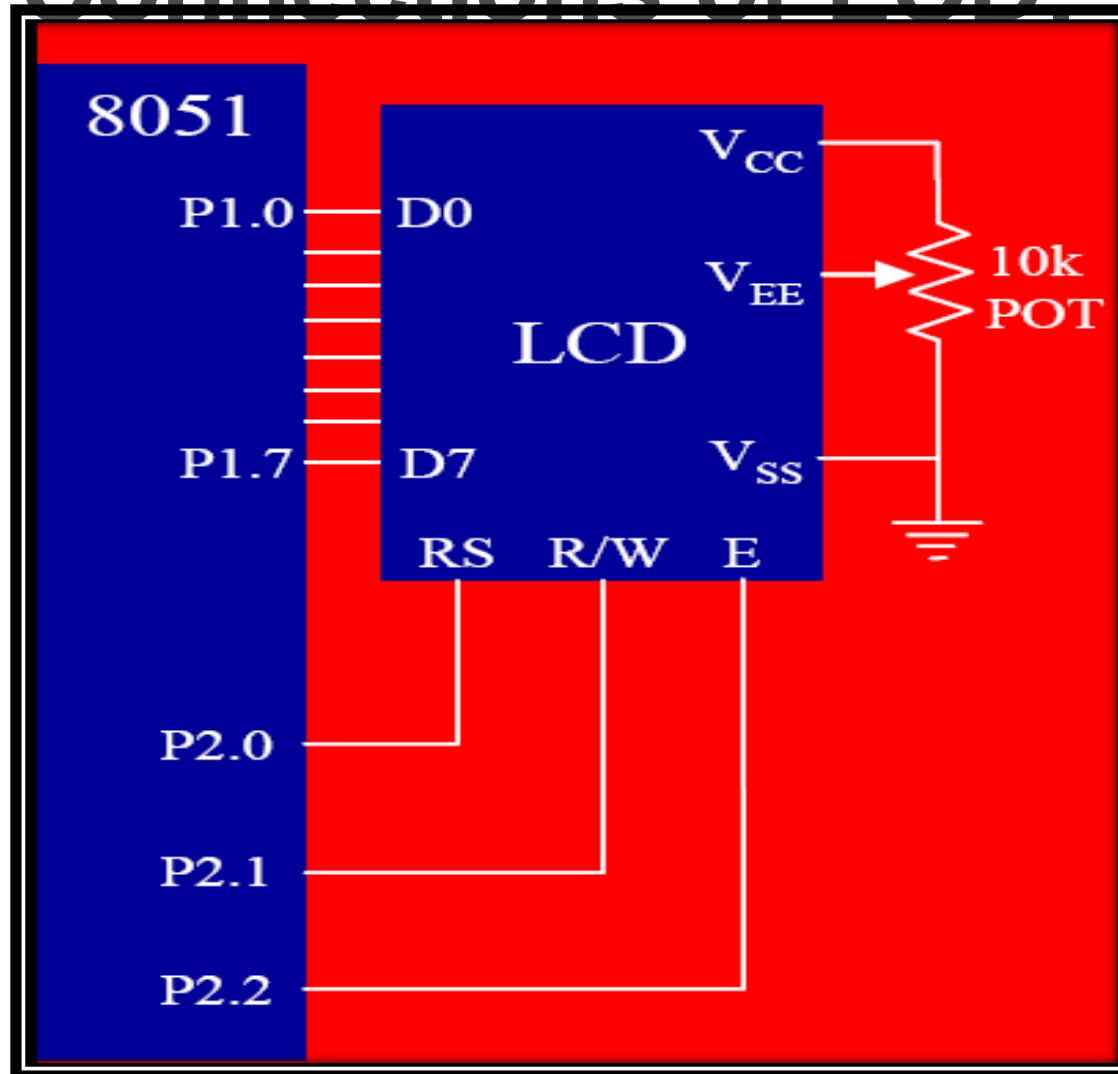
16x2 LCD Module



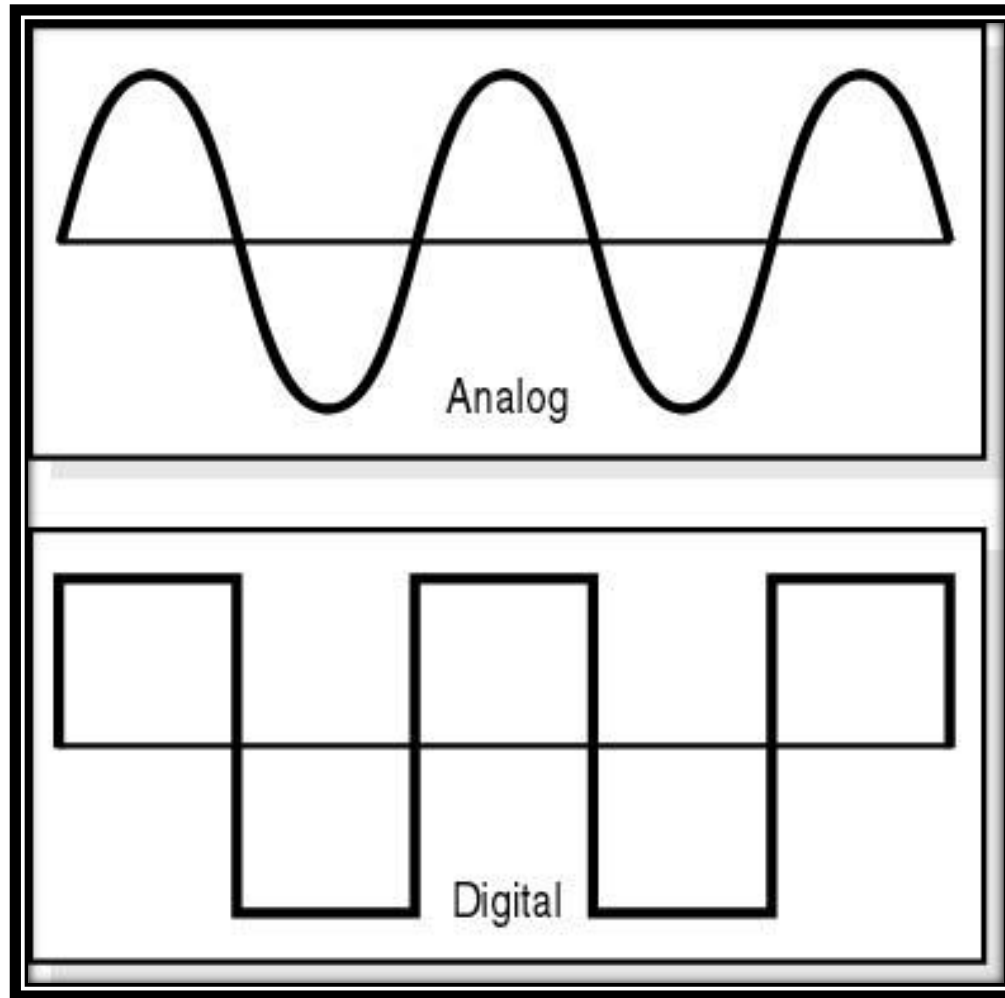
Pin Description:

Pin	Symbol	I/O	Description
1	Vs	-	Ground
2	Vcc	-	+5 V
3	V _{EE}	-	Contrast control
4	RS	I	Register Select
5	R/W	I	Read/Write
6	E	I/O	Enable
7	DB0	I/O	8 bit data bus
8	DB1	I/O	8 bit data bus
9	DB2	I/O	8 bit data bus
10	DB3	I/O	8 bit data bus
11	DB4	I/O	8 bit data bus
12	DB5	I/O	8 bit data bus
13	DB6	I/O	8 bit data bus
14	DB7	I/O	8 bit data bus

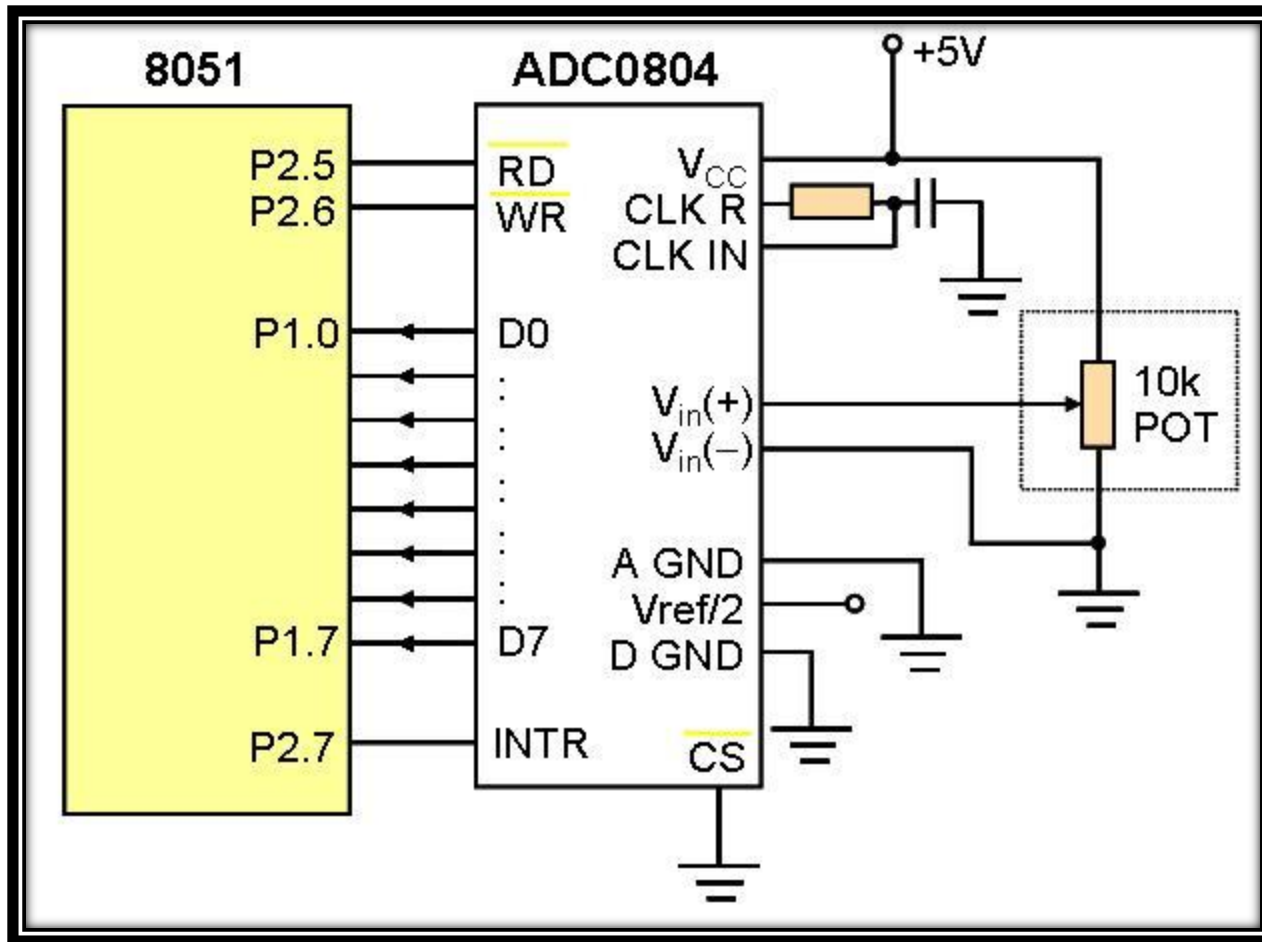
Pin Connections of LCD-



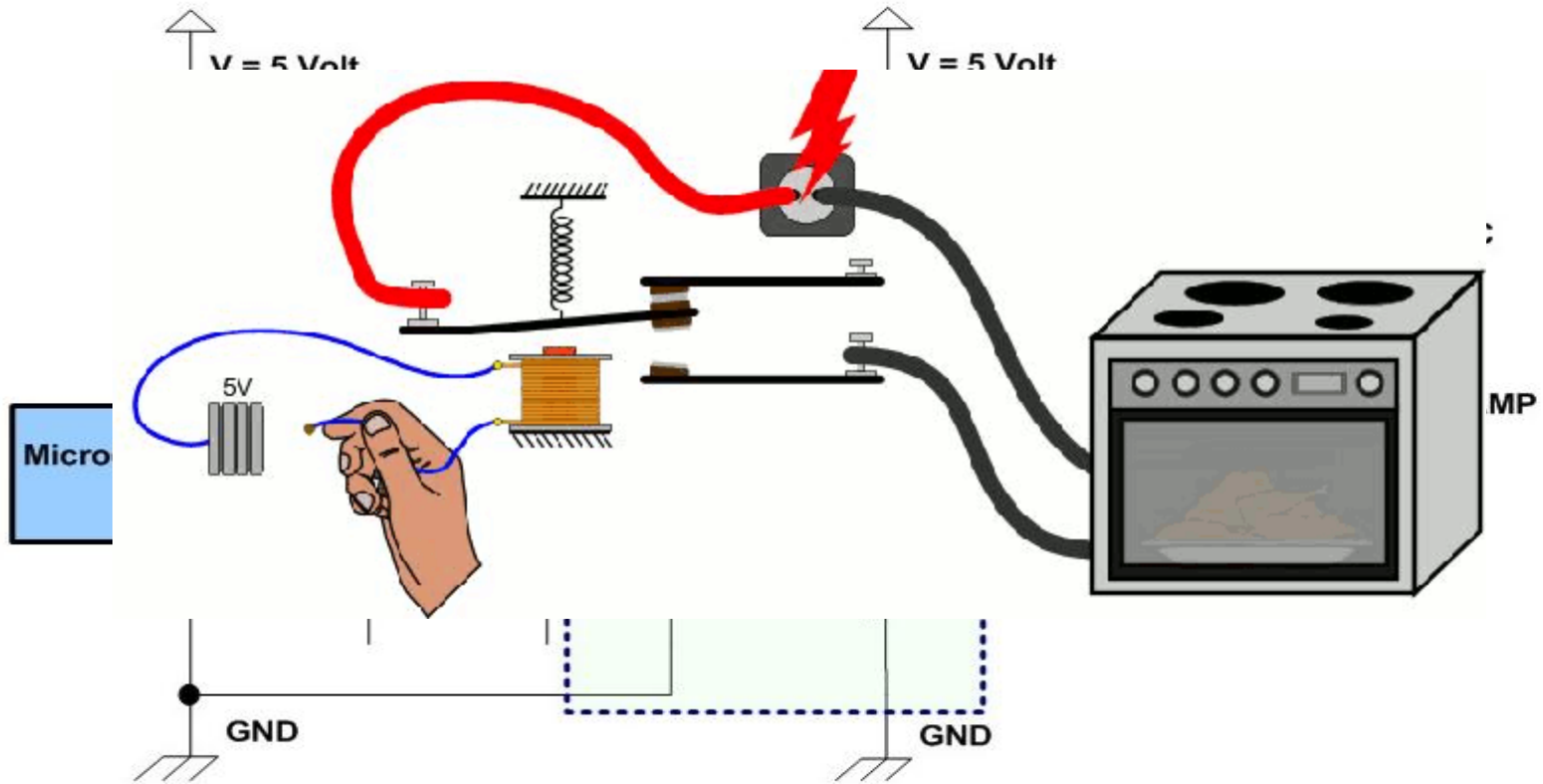
Analog Vs Digital:



ADC Interfacing:

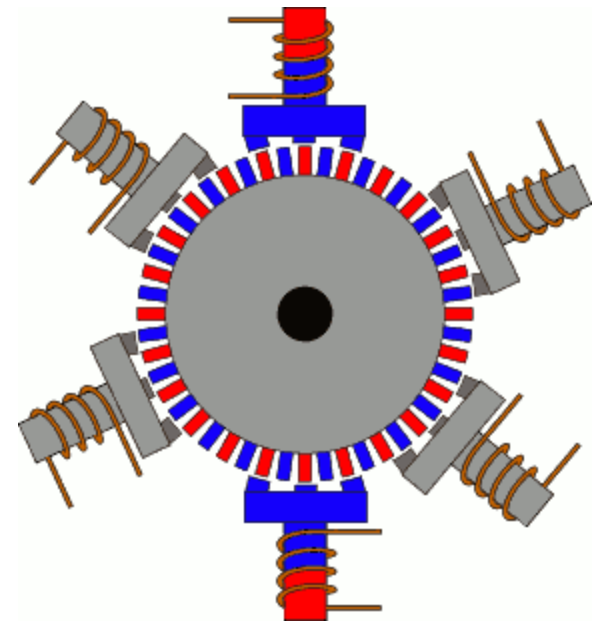
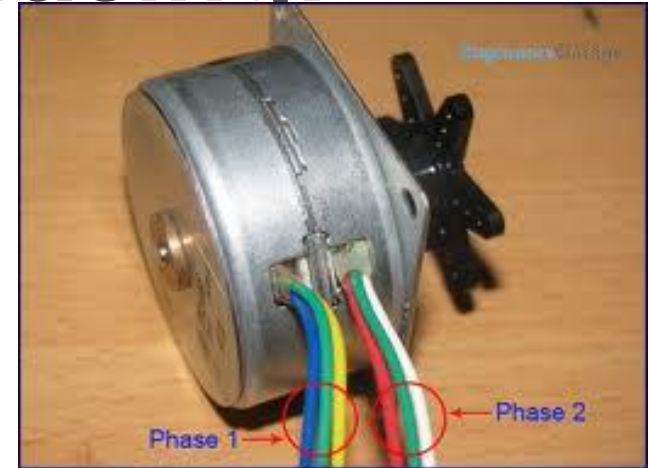
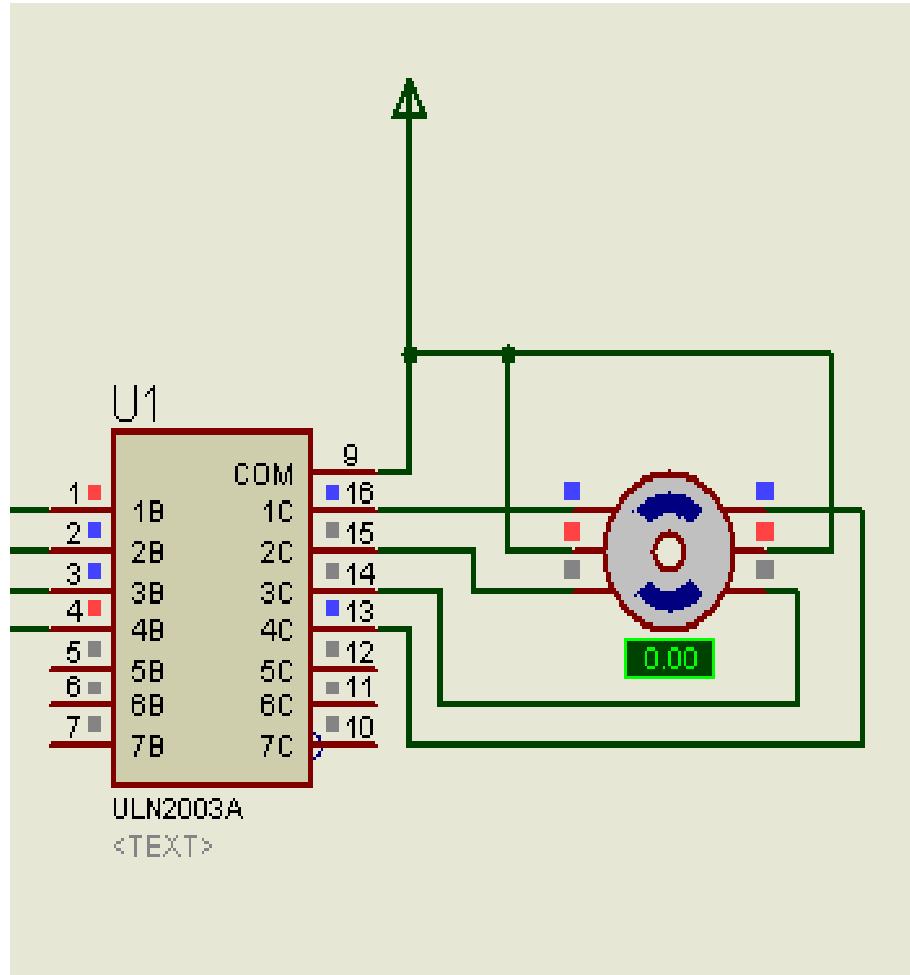


Relay Interfacing:



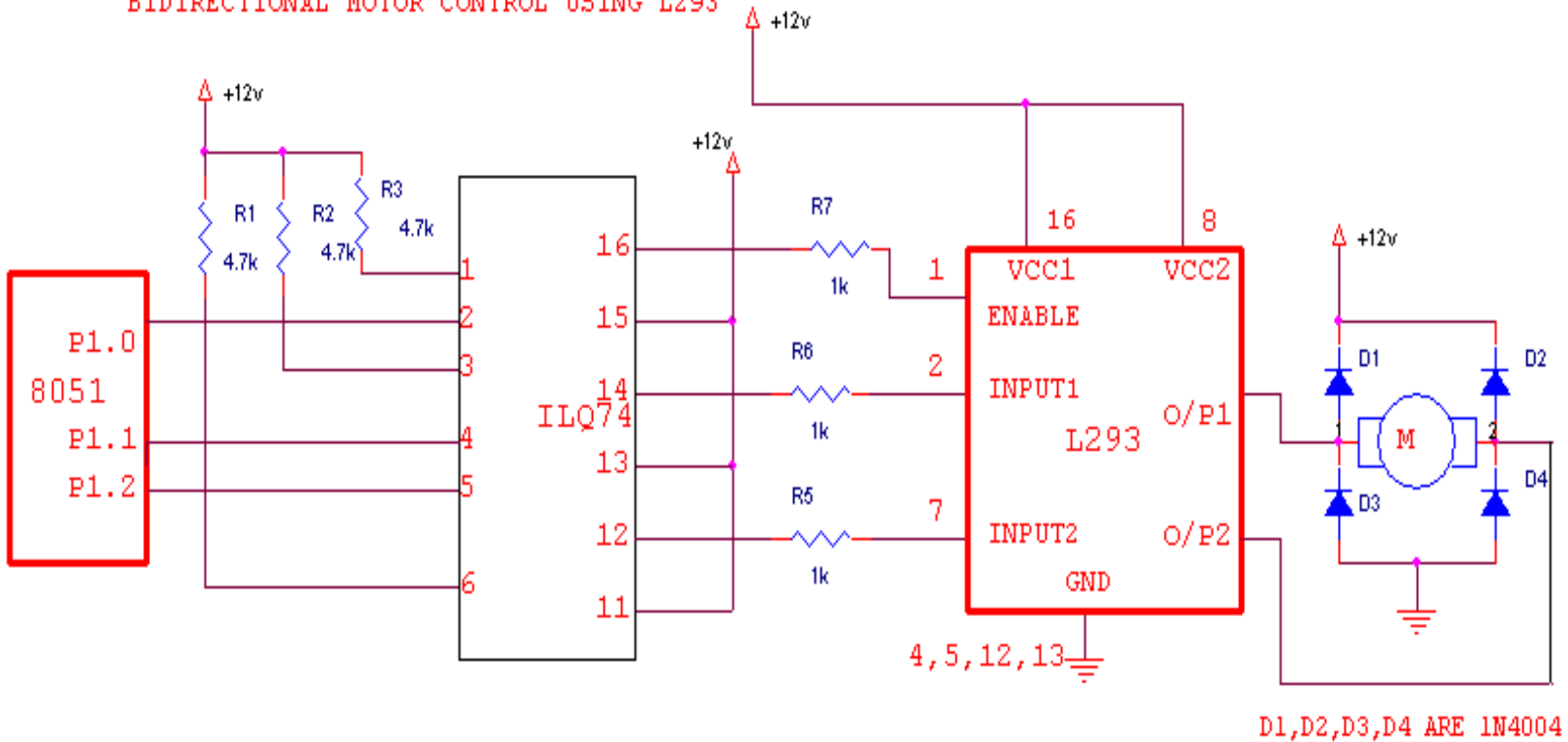
Isolating the Microcontroller I/O Port with 4N35

Stepper Motor Interfacing:



DC Motor Interfacing:

BIDIRECTIONAL MOTOR CONTROL USING L293



Applications of 8051:

❑ Home

- Appliances, intercom, telephones, security systems, garage door openers, answering machines, fax machines, home computers, TVs, cable TV tuner, VCR, camcorder, remote controls, video games, cellular phones, musical instruments, sewing machines, lighting control, paging, camera, pinball machines, toys, exercise equipment

❑ Office

- Telephones, computers, security systems, fax machines, microwave, copier, laser printer, color printer, paging

❑ Auto

- Trip computer, engine control, air bag, ABS, instrumentation, security system, transmission control, entertainment, climate control, cellular phone, keyless entry