Microcontroller – List of Programs

PART – A (Programming using simulator)

Activity 1. Study of addressing modes

1. Program to illustrate the different addressing modes available in 8051 using "mov" instruction

Activity 2. Data Transfer instructions

2. Block move (without overlap) - 10bytes of data from 0X30-0X3A to 0X40-0X4A
3. Block move (with overlap) - 10bytes of data from 0X30-0X3A to 0X35-0X3F
4. Block exchange – 10bytes of data between 0X30-0X3A to 0X40-0X4A
5. Block move(Internal to external memory or vice versa) - 10bytes of data from 0X30-0X3A to 0X1000-0X100A
6. Block move(Code to Data memory) – 10bytes of data from 0X30-0X3A to 0X40-0X4A
7. Exchange register data using stack

Activity 3. Arithmetic instructions:

8. Add, sub, div, mul of 8 bit number with immediate data access
9. Add and Sub of 16bit numbers
10. Add two negative numbers
11. Find the cube of a number(0FF)
12. Find an average of data stored in memory from 0X30-0X3A
13. HEX(00-FF) UP/DOWN counter (Program should check value @R0=0X30, if 0X30=0 then up counter else down counter)
14. BCD(00-99) UP/DOWN counter (Program should check value @R0=0X30, if 0X30=0 then up counter else down counter)

Activity 4. Branch & Logical instructions :

15. (CMP)Find 2's complement of a number
16. (ANL)Packed to Unpacked BCD(bit Masking)
17. (ORL)Unpacked BCD to ASCII
18. (XRL)ASCII to BCD
19. (RLC)Count the number of positive and negative numbers in 10bytes of data from 0X30-0X3A(R3 should contain number of +ve element and R4 should contain number of –ve elements)
20. (RRC)count the number of 1's and 0's in a byte(Parity detector) – (R3 should hold the number of ones and R4 should hold number of zeroes)
21. Convert packed BCD to Hexadecimal and vice versa (Code converters)
22. Count the number of even and odd numbers in 10bytes of data from 0X30-0X3A(R3 should contain number of even element and R4 should contain number of odd elements)
23. Smallest/Largest number in 10bytes of data from 0X30-0X3A to 0X40-0X4A (R3 – should store the smallest/largest number and R4 – should store address of the smallest/largest number)

24. Finding if a given word is a palindrome
25. Search an element with location of an element
26. Sorting 10bytes of data from 0X30-0X3A to 0X40-0X4A in Ascending/Descending order

Activity 5. Delay generation (Timers)

27. Generate the square wave of 1Khz (Without timers)
28. Generate the square wave of 10Khz (With timers)

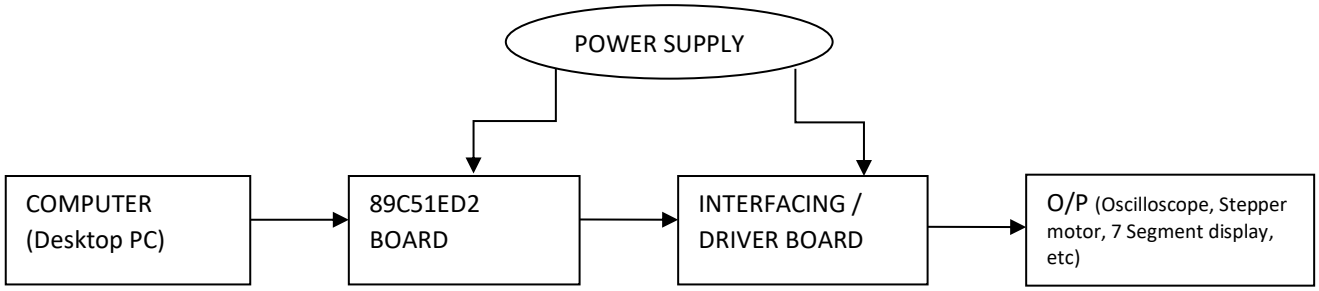
Activity 6. Subroutine Instructions (UART)

29. Logical or Delay loop using Call and return instructions
30. Serial communication program to transfer 'BMS' and receive any data provided by the user
31. Interrupt program

PART – B (Interfacing)

32. Different waveform generation – Square, Sine, Triangle, RAMP etc. using DAC interfacing module
33. Stepper and DC motor interfacing
34. Elevator
35. Simple calculator using 7segment/LCD display and Keypad
36. External ADC and Temperature control interface

Steps for interfacing circuits:



- Target1 –> Options for Target 'Target1'

1. Device : Choose the device/IC number (89C51ED2)

2. Target : The external clock frequency needs to be set to an appropriate value depending on the board specification 11.0592MHz

3. Output : The output is to be generated in .HEX file

4. Debug : USE Keil51 hardware