EC 39202: Embedded Systems Laboratory

E & ECE Department

Experiment 1A: *Familiarization with 8051 Kit through Assembly language programming*

Duration: 1 day

Problem statement:

Write three **assembly language programs** in **Keil µ-Vision, down load** them in **8051 µ-Controller kit** through **WIN 51E, execute** them and **demonstrate** the results for the following tasks:

a) In the external memory of 8051 kit, an array of 100 random data bytes is kept from location 9000H onwards. You need to sort the data in ascending order and then, perform binary search for a number stored at location 9500H in the sorted array. If the number is present in the array then the index (not address) of the array element should be stored at location 9550H. Otherwise, -1 should be stored at the location 9550H.

b) Consider a polynomial, $f(x) = a_n x^n + a_{n-1}x^{n-1} + \ldots + a_1 x + a_0$ which can alternately be represented in the form $f(x) = a_0 + x(a_1 + x(a_2 + \ldots x(a_{n-1} + xa_n)))\ldots)$. Its coefficients are stored at memory locations starting from 9502H and, the values of 'n' and 'x' are stored at location 9500H and 9501H respectively. You need to evaluate the polynomial and store the result at location 9550H.

c) You need to check whether a NULL-terminated string stored from location 9000H is a substring of another NULL-terminated string stored from location 9200H or not. If it is 'TRUE' then, store the start index (not address) of the substring present in the second string at the memory location of 9500H. Otherwise, store -1 at the same location.

Keep the programs in your group folder

Experiment 1B: *Familiarization with EdSim51 through Assembly language programming*

Duration: offline

Problem statement:

Write three **assembly language programs** in ***EdSim51 environment*****, simulate** them and **demonstrate** the results for the tasks stated in **Experiment 1A.**

Keep the programs in your Laptop.