**2 Digit Up/Down Counter Circuit**

Main principle of the 2 Digit Up Down Counter circuit is to increment the values on seven segment displays by pressing the button. When button 1 is pressed, the value on the display is incremented by one and when the other button is pressed, the value on the display is decremented by one.

The value on the display can be incremented and decremented from 0-99 as it uses only 2 displays. If you want to display 3 digits, three displays should be used i.e. three 7-Segment Displays. There are many circuits available for 2 digit up/down counter but using a microcontroller reduces components and space on the board but simple programming is required.

### **Circuit Design of 2 Digit 7-Segment Up Down Counter**

The 2digit Up/Down counter consists of two seven segment displays connected to ATMEGA8 microcontroller. The seven segment display consists of 8 pins and one common pin.

There are mainly two types of seven segment displays 1) common cathode 2) common anode. The display here used is common cathode display. Generally for common cathode displays, common pin should be grounded and for common anode, it should be connected to VCC.

In Seven segment display, there are seven segments and they are similar to seven LEDs. Seven pins belong to these seven segments where as the last pin is dot at the coner of the display. For common cathode, display assigning logic1 to the segment pin glows particular segment. In case of common anode, the segment pin should be assigned logic0 in order to glow the segment. Each segment is given one name starting from ‘a ‘and last segment dot is ‘h’.

In our circuit, seven segment display is connected to micro controller through a current limiting resistor of 330 ohms. Two buttons in pull- down mode are also connected.

The necessity of connecting the buttons in pull down mode is to avoid floating state of the button i.e. unknown state. If the button is connected in pull down mode, this ensures that button is initially in logic0 state.

