Arduino Calculator

Objective: We will take inputs from user using 4*4matrix keypad and perform operations like addition, subtraction, multiplication, divison, using arduino uno board display the results in LCD display.

Components required: Arduino board, LCD display, 4*4 Keypad

INPUTS	OUTPUTS
Arduino board	LCD display
4*4 Keypad	

About 4*4matrix Keypad :

INTRODUCTION: Most of the time we are used keys, buttons, or switches to get input values when we interface one key ,button, or switch to the micro controller, then it needs one gpio pin, when we want to interface many keys like 9,or 16 etc then it needs many GPIO pins of a microcontroller and we will lose many GPIO pins, This problem can solve by 4*4 matrix keypad ,it is an input device ,it usually provide input values, it has 16 keys ,which means it provides 16 input values. This is used only 8 GPIO pins of micro controller.

4*4 keypad pin diagram: it has 4 rows(R1,R2,R3,R4) and 4 columns(C1,C2,C3,C4)R1: Taken out from first row, R2: Taken out from second row, R3: Taken out from third row, R4: Taken out from fourth row , C1: Taken out from first column,C2:Taken out from second column,C3:Taken out from third column,C4:Taken out from fourth column

Hardware overview: these key pad modules are made of thin flexible membrane material .this keypad consist of 16 keys ,these keys are organized in matrix of rows and columns. All these switches are connected to each other with a conductive trace. normally there is no connection between rows and columns. when we press a key then a row and column make contact.

How this 4*4 keypad works: To detecting a pressed key , the microcontroller grounds all rows by providing 0 to the output pins, and then it reads the columns. if the data reads from column=1111 it means no key has been pressed. When we will pressing the button shorts one of the row line to one of the column line, allowing current to flow between them. for example botton1 is pressed ,column 1 and row 1 is shorted. R1R2R3R4=0000, C1C2C3C4=0111. If the first bit value is 0 which means that button 1 is pressed.

Flow Chart: