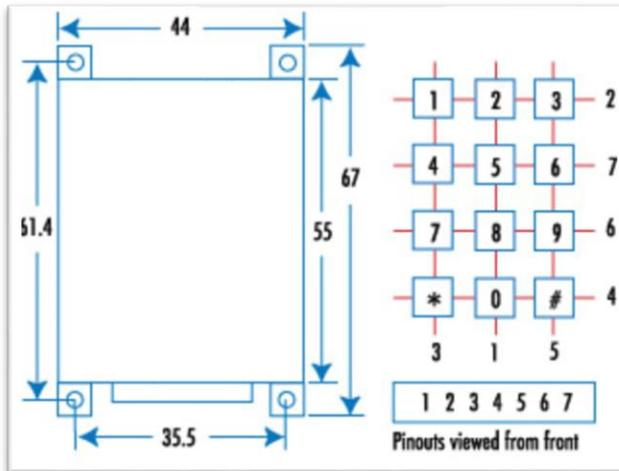# 12 Key Numeric Keypad

Hardware

The SP0770 12 Key numeric keypad works in a typical "matrix" like structure as shown in the picture below.

This style of setup is most often called a "matrix keypad" and each of the keys forms a bridge or short across two of the corresponding pins. For example, if you were to press the number "5" on the keypad, there would be a connection between pins 1 and 7 on the row.

Using the keypad and software

To use the keypad on a microcontroller, we can send a HIGH signal voltage to each of the rows, one at a time, and test which column pin receives the signal. For instance, consider the below code, with each pin connected to the same pin number on the Arduino.

```
int rows[] = {2, 7, 6, 4};
int cols[] = {3, 1, 5};
/* Note: this code is only provided as conceptual example. */
void setup(){
  Serial.begin(9600);
  setRows(OUTPUT);
  setCols(INPUT_PULLUP);
}
void loop(){
  turnOnOnly(6); //turn (LOW) the row on pin 6, others (HIGH)
  int col = readColumns(); //read which column is (LOW)
  switch (col){
    case 3: // the button lies between pin 6 and pin 3
      Serial.println("Button 7 pressed"); break;
    case 1: // between pin 6 and 1
      Serial.println("Button 8 pressed") break;
    case 5:
      Serial.println("Button 9 pressed") break;
  }
  delay(1);
}
```