College of Science and Computer Engineering

Department of Computer Science & Artificial Intelligence

CCAI 321

Advanced Topics in Artificial Intelligence

Lab# 6

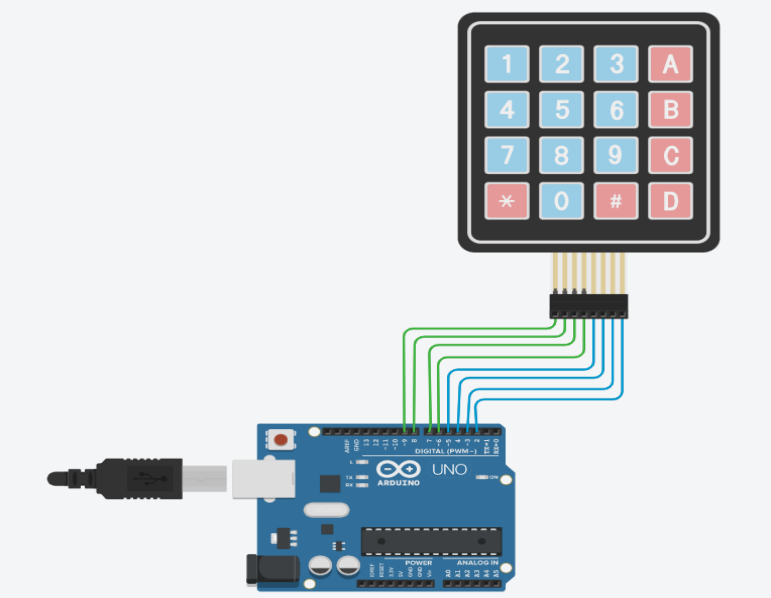
Keypad

جامعة جدة
University of Jeddah

Lab Objectives:
The aim of this LAB experiment is to teach students how to interface a **4x4** phone keypad to the Arduino board and display the character corresponding of the pressed key.

Hardware Required:
1. Arduino Uno Board
2. NumericKeypad

Circuit:
The circuit to be implemented in this experiment is a simple interface of a **4x4** keypad to the Arduino board. The implementation of this interface using Virtual Breadboard software.



Program:
In this part, you will write a program to scan the keypad to determine which key is pressed (if any) and display the character corresponding to this key.

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Code:

```
#include <Keypad.h>

const byte ROWS = 4; //four rows
const byte COLS = 4; //four columns

//define the cymbols on the buttons of the keypads
char hexaKeys[ROWS][COLS] =
{
  {'1','2','3','A'},
  {'4','5','6','B'},
  {'7','8','9','C'},
  {'*','0','#','D'}
};
byte rowPins[ROWS] = {9, 8, 7, 6};
 //connect to the row pinouts of the keypad

byte colPins[COLS] = {5, 4, 3, 2};
 //connect to the column pinouts of the keypad

//initialize an instance of class NewKeypad
Keypad customKeypad = Keypad( makeKeymap(hexaKeys), rowPins, colPins,
ROWS, COLS);
void setup(){
  Serial.begin(9600);
}
void loop(){
  char customKey = customKeypad.getKey();

  if (customKey){
    Serial.println(customKey);
  } }
```

➢ Lab Implementation:

To validate your design you need first to build the source code and then run the emulator. On the *Debug Toolbar*, locate and click the *Build* button to build your code. If there are no errors in the compilation process, emulate the your program by clicking the run button located on the *Application Toolbar*. Observe the displayed value when a key is pressed.