FORMAN CHRISTIAN COLLEGE
A Chartered University
Embedded Systems CSCS306
LAB-03

This lab is online and should be completed individually.
Lab is time constrained. It should be completed within prescribed time.
You need to submit a report comprising of an introduction to the said lab, circuit diagram, image of your final circuit and code. Each lab will be graded out of 100. Rubric for this lab is as follows:

Hardware properly wired and working	**10%**
Code	**60%**
Report	**30%**

Lab Task

In this lab we will play with keypad and learn how to write code in Arduino that can make keypad work as user input.
Connect one LED with the Arduino from pin 2. Connect your 4x4 key pad with Arduino. Given is a skeleton code that can display a digit pressed on keypad on the serial monitor. ***Use the same pins for keypad as shown in the skeleton code below.***
Make sure you have downloaded and included the keypad library.

```
#include <Key.h>
#include <Keypad.h>
const byte ROWS = 4; //four rows
const byte COLS = 3; //three columns
char keys[ROWS][COLS] = {
  {'1','2','3'},
  {'4','5','6'},
  {'7','8','9'},
  {'#','0','*'}
};
byte rowPins[ROWS] = {6,7,8,9}; //connect to the row pinouts of the keypad
byte colPins[COLS] = {10,11,12}; //connect to the column pinouts of the keypad

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );

void setup(){
  Serial.begin(9600);
}

void loop(){
  char key = keypad.getKey();

  if (key != NO_KEY){
    Serial.println(key);
  }
}
```

Now you need to make changes in the above code so that it should simulate the operation of a gas station terminal.

- To start with when system starts, make an LED blink fast for couple of times, just to show some activity. Use LED connected to pin 13 of your Arduino board.
- An appropriate message is displayed on serial monitor.
- Operator will punch amount in PKRS for which customer has requested to dispense the fuel. The amount can be a number between 2 to 4 digits. Use # symbol on your keypad as SUBMIT button.
- Next you need to convert these digits from string to integer. (Do not use double or float)
- Once you have the amount punched and converted, next convert it into volume of fuel. Assume fuel is Rs.200 per liter. (You may ignore the error due to integer division at this stage). This assumption also means that one must purchase petrol of minimum Rs.200. Any amount less than that should be decently taken care of.
- Now we assume that our pump that dispenses fuel to the patrol tank is calibrated at one liter per three seconds. An LED should blink for appropriate number of times simulating the pump.
- After that, system should pay tribute to the customer with an appropriate message and loop ends.
- A few sample runs that may appear on serial monitor are as shown below:

Enter amount: 1000
You will have 5 Lit of fuel against this amount.
Dispensing fuel. Please wait.
Thank you for visiting us.
Drive Safe.

Enter amount: 170
Sorry, system cannot dispense fuel against this amount.
Thank you for visiting us.
Drive Safe.