

**UNIVERSITY OF BATANGAS – LIPA CAMPUS
COLLEGE OF ENGINEERING AND
ARCHITECTURE COMPUTER ENGINEERING**

ARDUINO CALCULATOR

Experiment #4

MICROPROCESSOR SYSTEMS

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Results And Discussion:

```
#include <Wire.h>
#include
  <LiquidCrystal_I2C.h>
#include <Keypad.h>

LiquidCrystal_I2C
lcd(0x27, 2, 16);

const byte numRows = 4;
const byte numCols = 4;

char keys[numRows][numCols] = {
  {'1', '2', '3', '+'},
  {'4', '5', '6', '-'},
  {'7', '8', '9', '*'},
  {'.', '0', '=', '/'}
};

byte
rowPins[numRows] = {9, 8, 7, 6};
byte colPins[numCols] = {5, 4, 3, 2};
Keypad keypad = Keypad(
  makeKeymap(keys),
  rowPins, colPins,
  numRows, numCols
);

uint64_t value = 0

void StartScreen() {
  lcd.print("Test");
  delay(500);
}

void updateCursor() {
  if (millis() / 250 % 2 == 0 ) {
```

```

lcd.cursor();
} else {
lcd.noCursor();
}
}
void setup() {
  lcd.init();
  lcd.backlight();
  StartScreen();
  lcd.clear();
  lcd.cursor();
  lcd.setCursor(1, 0);
}

```

```

char operation = 0;
String memory = "";
String current = "";
uint64_t currentDecimal;
bool decimalPoint = false;

```

```

double calculate(char operation, double left, double right) {
  switch (operation) {
case '+': return left + right;
case '-': return left - right;
case '*': return left * right;
case '/': return left / right;
}
}

```

```

void processInput(char key) {
if ('-' == key && current == "") {
  current = "-";
  lcd.print("-");
  return;
}

```

```

switch (key) {
case '+':
case '-':
case '*':
case '/':
if (!operation) {

```

```

    memory = current;
    current = "";
}
operation = key;
lcd.setCursor(0, 1);
lcd.print(key);

lcd.setCursor(current.length() + 1, 1);
return;

case '=':
float leftNum = memory.toDouble();
float rightNum = current.toDouble();
    memory = String(calculate(operation, leftNum, rightNum));
    current = "";
lcd.clear();
lcd.setCursor(1, 0);
    lcd.print(memory);
    lcd.setCursor(0, 1);
    lcd.print(operation) return;

}

if ('.' == key && current.indexOf('.') >= 0) {
return;
}

if ('.' != key && current == "0") {
current = String(key);
} else if (key) {
current += String(key);
}

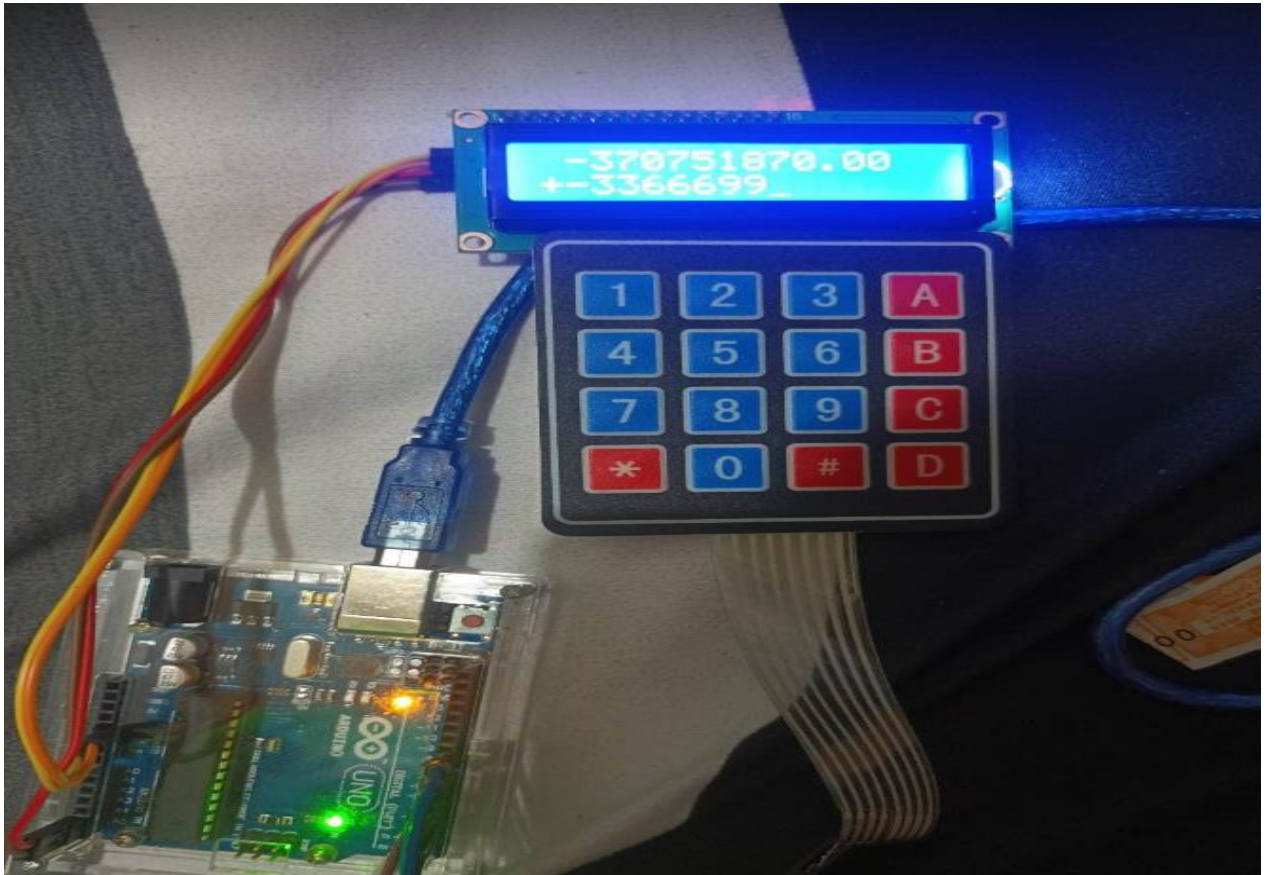
lcd.print(key);
}
void loop() {
updateCursor();

char key =
keypad.getKey();
if (key) {
processInput(key);

```

}
}

Documentation:



Conclusion:

We figure out how to connect the keypad to the Arduino and utilize it. Keypad is an Arduino library that enables the usage of keypads in the matrix style. There are four rows and four columns on the 4x4 keypad. When a button is pressed, the switch between a column and a row trace is closed, allowing current to flow between a column pin and a row pin. The Arduino detects which button is pressed by detecting the row and column pins connected to the button.

https://drive.google.com/drive/u/0/folders/12_oecHhvZQO9vvgzIPMmY-m6S9v57ygO?fbclid=IwAR2tzyFWV6vcBimNN1IVujlPmBnm-AW21NKf0K559rUe3hzhpWoiKsATVQ