Lab 5 Report

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Contents

1 Hello Arduino

1.1 Potentiometer Works

1.1.1 Summary

For this task we had to compile the provided code and run it on the Arduino. I used an old potentiometer, but as it does not fit in a breadboard it was hard to keep the wires in contact with the elements whilst trigger it and filming at the same time..

1.1.2 Proof

I got the first part working really quick: SupportingVideo/PotentiometerWorks

1.2 Running Average

1.2.1 Summary

We had to use or knowledge of C programming to extend the functionality provided in the base code. I hadn't done any C in the last year and a half so I was a little rusty on some of the syntax, but this was very straightforward.

1.2.2 Proof

Code:

```
int i = 0;
double sum = 0;
int average;

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

void loop() {
  int sensorValue = analogRead(A0);

  i++;
  sum = sum + sensorValue;
  average = sum/i;

  Serial.println(average);
  Serial.println(sensorValue);
  delay(500);

}
```

Video:SupportingVideo/RunningAverage

2 Interfacing with the keyboard

2.1 Keyboard Works

2.1.1 Summary

This task required us to use more provided code to integrate the keypad with the Arduino. I had to copy the code by hand as it is an image within a pdf and therefore I couldn't copy paste. Additionally I had to manually import the "Keypad" library and change "if (key != NO_KEY)" to "if (key == NO_KEY)". After this everything worked as intended.

2.1.2 Proof

SupportingVideo/KeyboardWorks

2.2 Switch Function

2.2.1 Summary

After we successfully implemented the code the addition of the ability to see the average on pressing '#' was straightforward. On my first run I tried to strcmp(key, checkValue) not remembering that you can just compare the utf-8 value of a char. Also I needed to make the sum a double after I had an integer overflow during one of my tests.

2.2.2 Proof

Code:

```
#include <Keypad.h>

const byte ROWS = 4;
const byte COLS = 4;

char keys[ROWS][COLS] = {
  {'1','2','3','A'},
  {'4','5','6','B'},
  {'7','8','9','C'},
  {'*','0','#','D'}
};

byte rowPins[ROWS] = {8,9,2,3};
byte colPins[COLS] = {4,5,6,7};

Keypad kpd = Keypad(makeKeymap(keys),rowPins,colPins,ROWS,COLS);
int ColPos = 0;
int i = 0;
double sum = 0;
int average;
char checkValue = '#';

void setup() {
  for(int k=0;k>14;k++){
    pinMode(k,OUTPUT);
  }
  Serial.begin(9600);

}
```

```
void loop() {
  char key = kpd.getKey();

  int sensorValue = analogRead(A0);
  i++;
  sum = sum + sensorValue;
  average = sum/i;

  if (key == NO_KEY){
    Serial.println(sensorValue);
  }
  else if (key == checkValue){
    Serial.println(average);
  }
  else{
    Serial.println(key);
  }
  delay(100);

}
```

Video: SupportingVideo/SwitchFunction