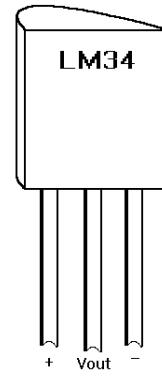


ESE 205 Arduino Mini-project 1

The first optional mini-project (and we mean optional) will be constructing a temperature sensor with an LCD display. Here's some info to get you started. You will be using the LM34 Fahrenheit temperature sensor. This is a 3-pin device with 5V and GND inputs and temperature output corresponding to the schematic to the right. The LM34 is designed to output 10 mV per degree Fahrenheit, so a reading of 0.73 V on the output pin means the temperature is 73°F. In order to use this on your Arduino you will have to connect the 5V and GND pins to the corresponding buses on your Arduino, and wire the output pin to an analog input pin.



To read the LM34, we use the `analogRead(pinX)` function. This will give you a value between 0 for GND and 1023 for 5V, because the analog pins on the Arduino are 10 bit ($2^{10} = 1024$). To convert this into a real voltage reading, take the ratio of the reading to 1023, and multiply this by 5V like the equation below.

$$V_{true} = \frac{V_{analog\ Read}}{1023} (5)$$

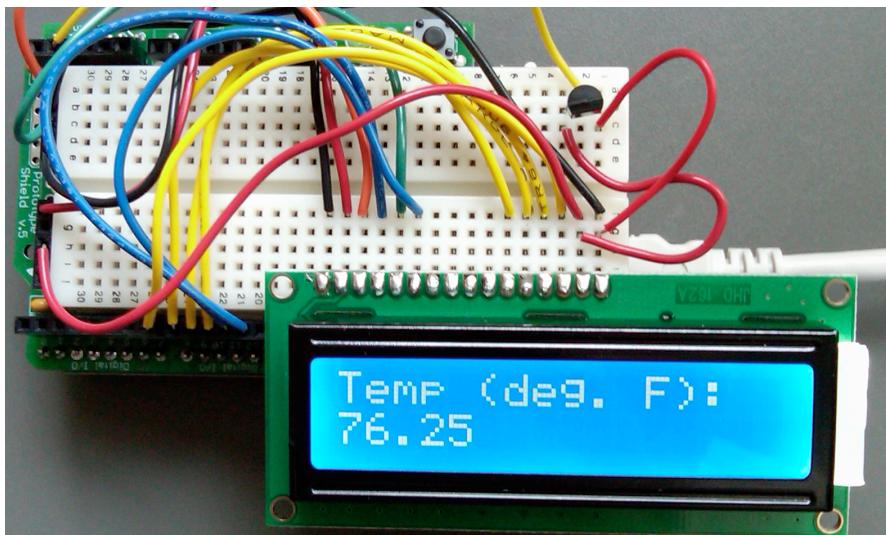
In order to display the current temperature you will have to wire an LCD display to 6 digital output pins on your arduino as well as 5V and GND. Luckily for you, we are providing you with working code for this mini project. All you have to do is wire the LCD display and the LM34.

In order to wire your LCD screen, see the datasheet at
[<www.mini-robot.com.mx/datasheets/JHD162A.pdf>](http://www.mini-robot.com.mx/datasheets/JHD162A.pdf).

You will notice from the code that you will use the pins labeled VSS, VCC, VEE, RS, E, DB4-7, and LED+-. Wire the pins according to the following assignments:

LCD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Arduino	GND	+5	GND	12	GND	11	-	-	-	-	7	8	9	10	+5	GND

Here is a picture of a final working project:



Good luck!