Estimation of light directivity

Bachelor Project Presentation

MOHAMAD BAHGAT SALAH

Outline:

- Author's Word
- Introduction.
  - What is "Estimation of light directivity".
  - Why such a topic is important.
- Components.
  - Hardware.
  - Software.
- Design.
- Analysis & Results.
- Live demo.

Thanks a lot

- Without you my Lord, I am truly nothing. Thank you for everything.

- Thank you my mom, thank you my dad, thank you to all of those who believed in me and who prayed for me. Thank you my grandfather, I will never forget your everyday prayers.

- Special thanks to one of my dearest Dr. I have ever met, special thanks to you Dr. Hisham. Thank you for being a father before being my supervisor.

Introduction:

- Author's Word
- **Introduction.**
  - - What is "Estimation of light directivity".
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Estimation of light directivity
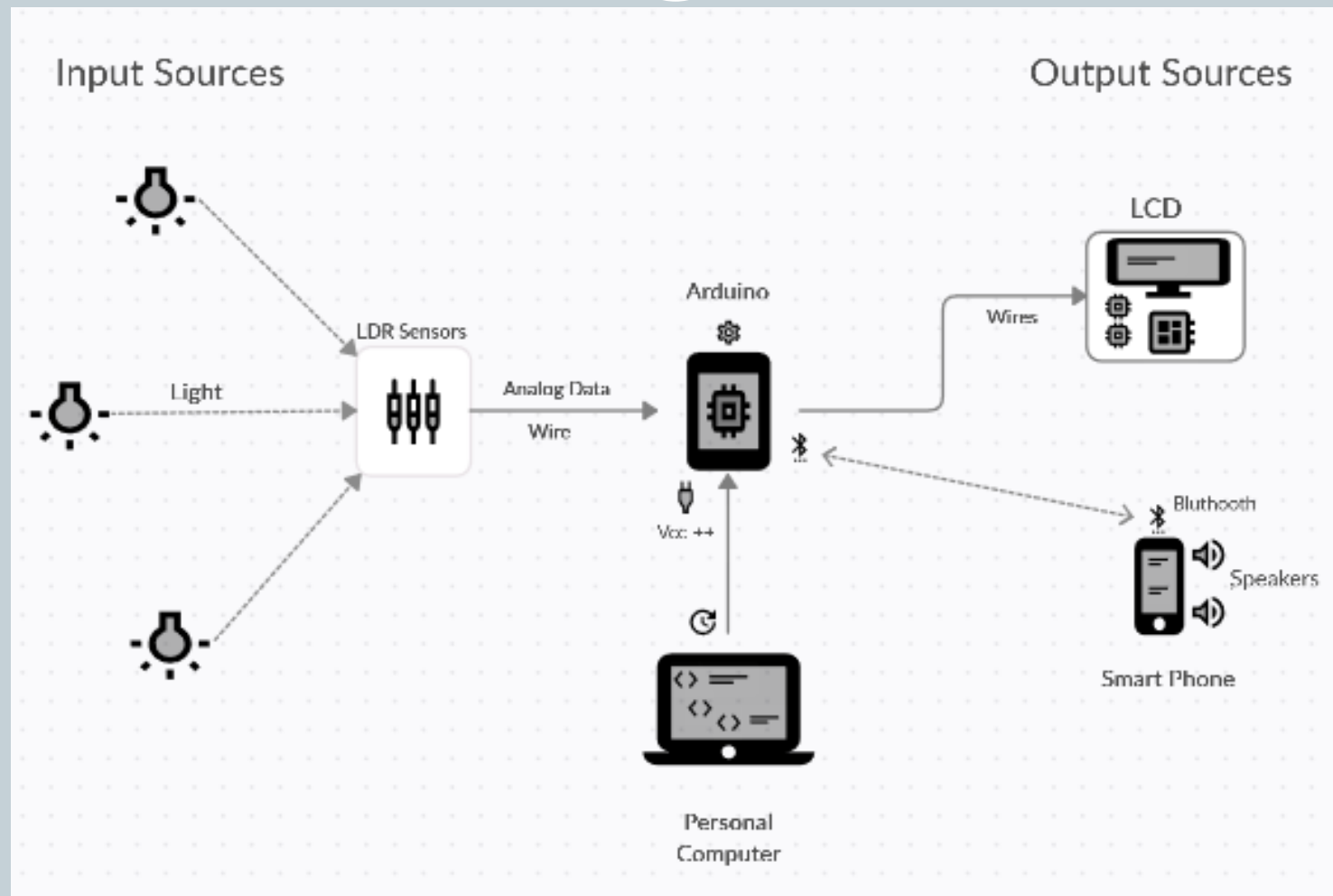
Why such a topic is important?

- By knowing the directivity and the intensity of light you will be able to determine where the shadows are and which of those places will be darker or lighter than the others.

- In photography, this is very useful, as it allows photographers and movie-makers to adjust their cameras' positions, so they can capture the clearest image.

- And in computer vision, Photo-chemical Reactions, Solar Systems it is very important.

Why such a topic is important? (Cont.)

- It allows us to determine the position of any light source even if it is moving and not fixed at a certain position.

- It allows us to determine the position of different waves other than the light wave. We can achieve this by replacing those light sensors with the suitable sensors of that field; like sound sensors, infrared sensors and in communication systems between transmitters and receivers.

Components:

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- **<u>Components.</u>**
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# We can divide the project into two parts; Hardware and Software.

- The hardware part that is responsible for any physical connections between devices and choosing the appropriate components from hardware devices that will help us to get what we want from light intensity and light directivity such as sensors.

- While the software part is responsible for installing the suitable apps on the PC and the smartphone and writing the code that would be burned on the microprocessor chip of the Arduino board.

Hardware:

- Arduino Mega 2560.

- 1Sheeld+.

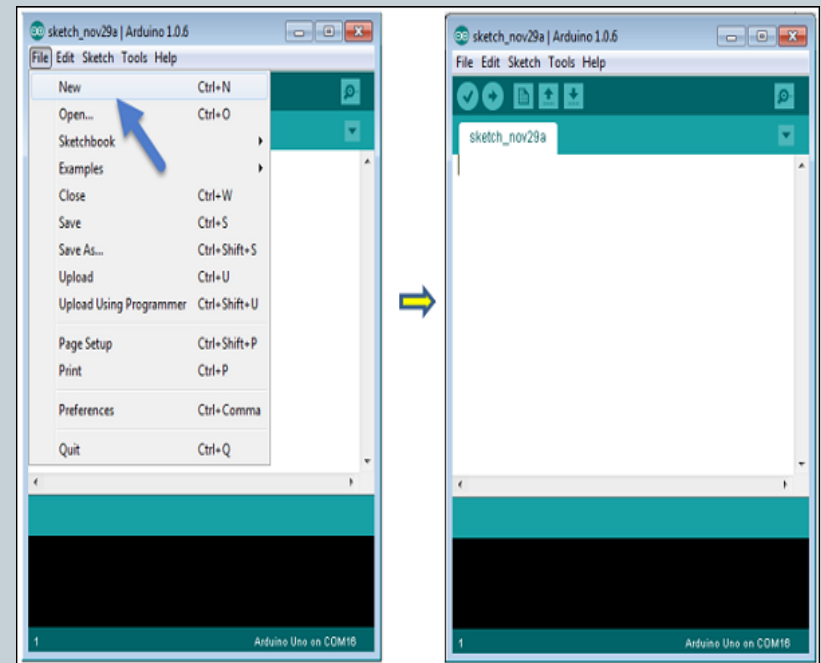- (LCD) 2×16.

- Breadboard.

- Wires.
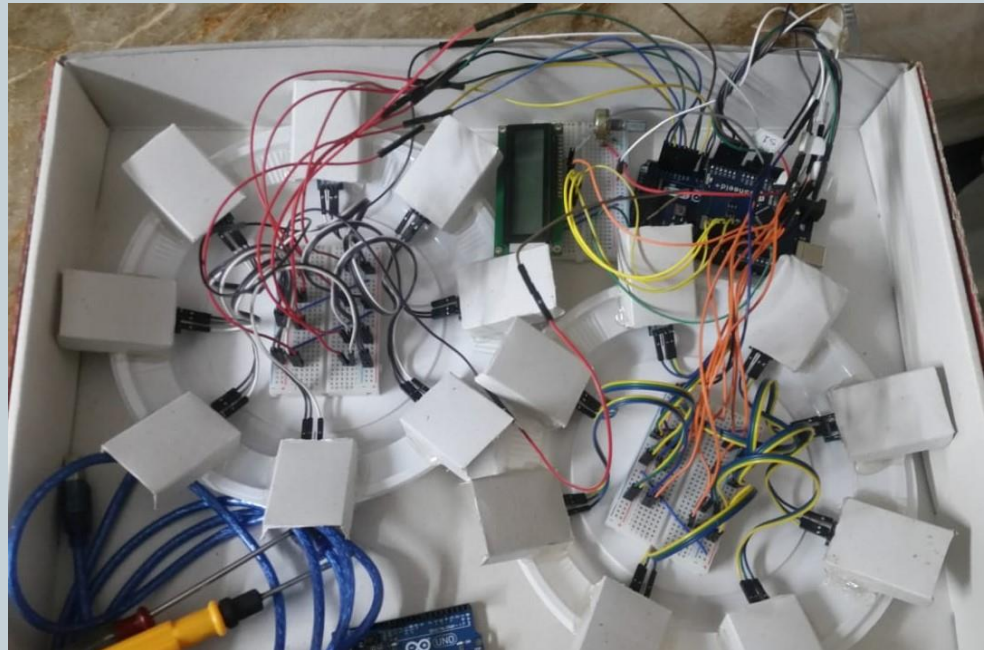
Software:

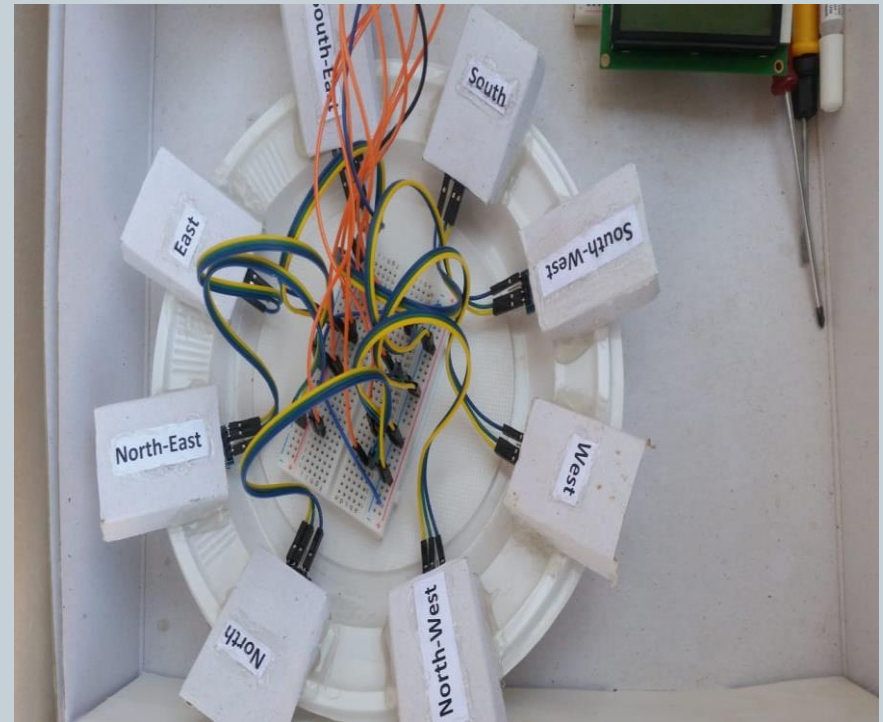- 1Sheeld+ Mobile App.

- Arduino IDE Software.

Questions?

Design:

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Design:

- Direction estimation
  - - Cardinal directions.
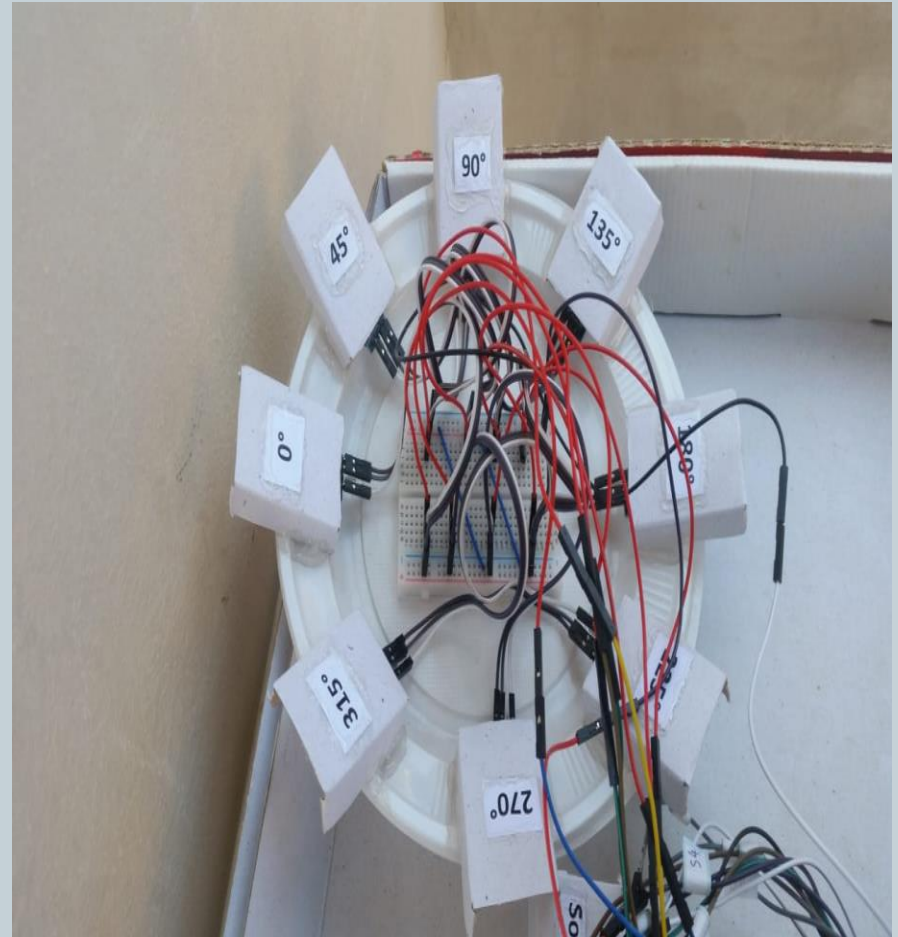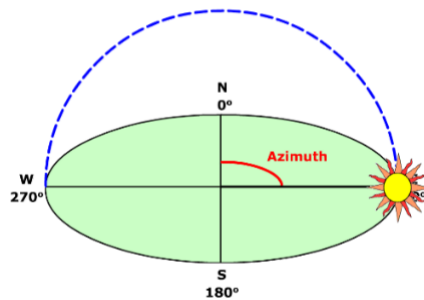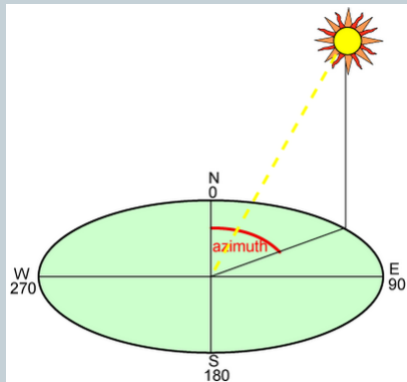 - - Ordinal directions.

In order to estimate both of them correctly, I used 8 LDR sensors and placed them 45 degree away from each other.
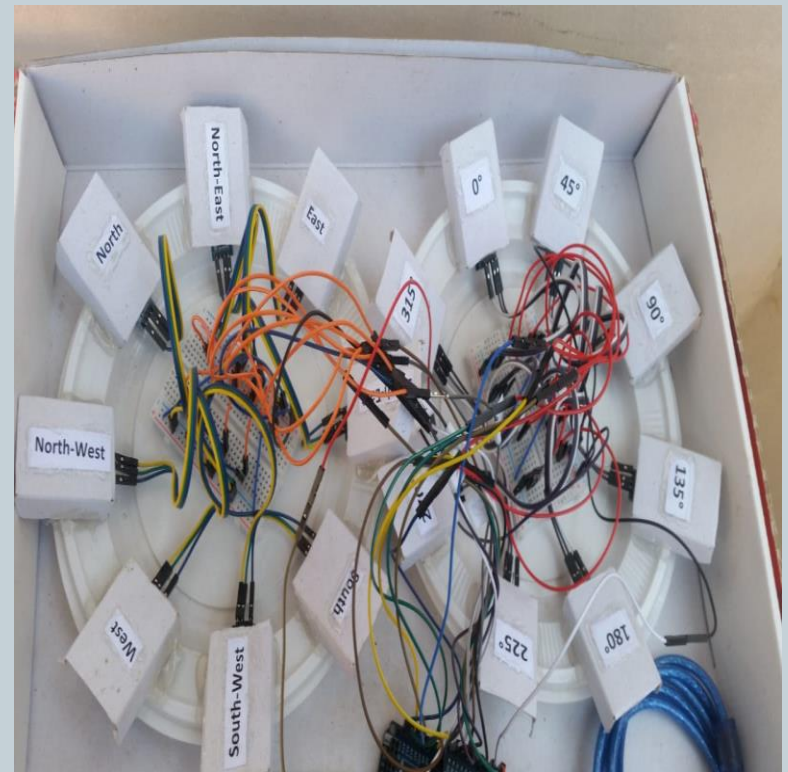
Design: (cont.)

- Azimuth Estimation.

The azimuth angle is the compass direction from which the sunlight is coming.

Design: (cont.)

- LDR covering and isolating. I surrounded it with a U-shape cardboard.

The reason of this is the LDR sensor is so sensitive in reading all the light that came to it from all the directions and not only those perpendicular rays.
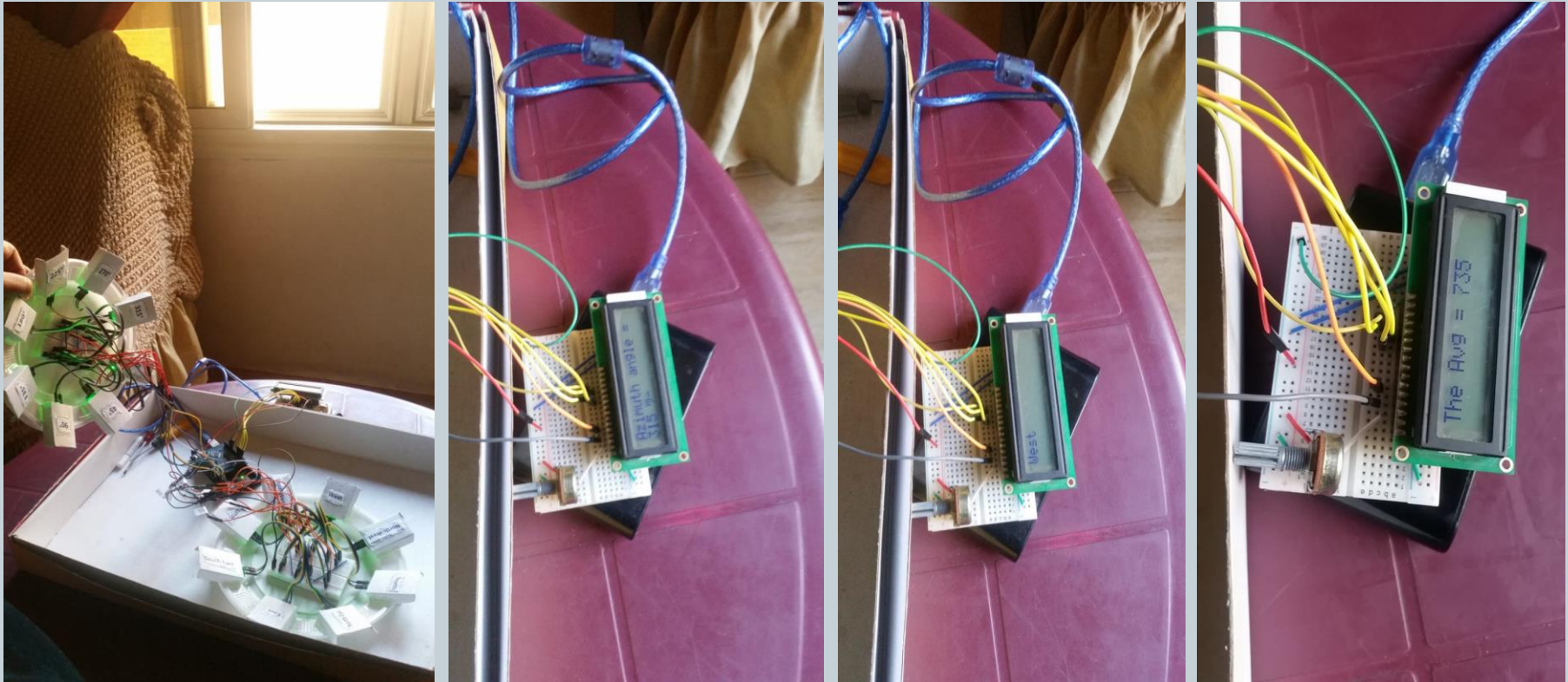
Analysis & Results:

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Analysis & Results:

Experiment 1

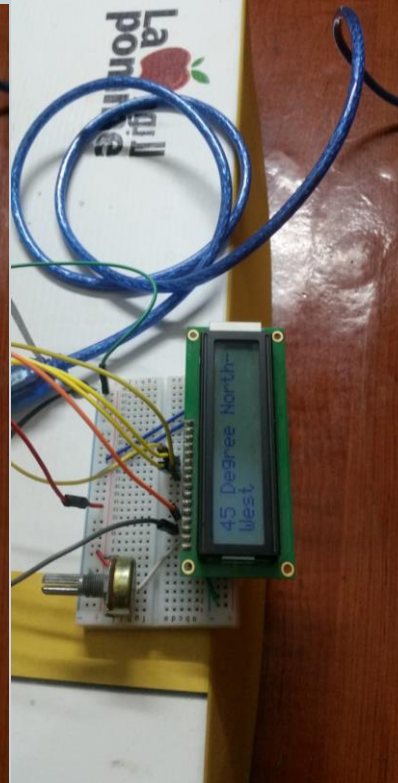Natural light has been used in this experiment.

Analysis & Results: (Cont.)

Experiment 2

Artificial light has been used in this experiment.

Questions?

Live Demo:

The End