

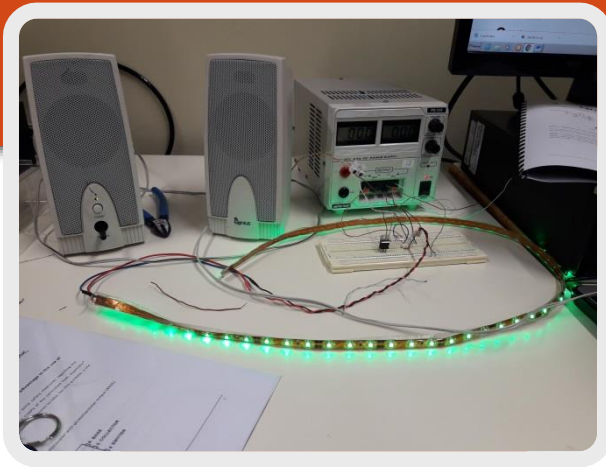


Erasmus+



Better Electro-World

How to control a LED strip according to the beat of the music



WHITE TEAM

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THE PROJECT SUMMARY

E World (Better Electro World) is a project which is set up on the idea that VET (Vocational Education and Training) can be learned best if a student acquires vocational qualifications by the good samples of practices on peer learning and project based implementations. The main reason for this project is to lessen the educational barriers of VET which hinder a student to be successful and proactive. The idea of this project on peer learning with the good examples of project based learning comes after finding that we have a lot of common needs, problems and reasons for participating in a European partnership.

In the implementation of this project, "Learn & Do" step is improved and reinforced by taking the next step "Learn & Teach". We aim to train trainees/workers for reaching good quality with an international knowledge, vocational skills and individual competence base, relevant to working life. That will increase their employability not only in their national business but also in the EU labor market. In addition, this will set up the frame for their lifelong learning.

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How to Control a LED Light Strip according to the Beat of a Music

This project will focus on the creation of a circuit with a LED strip that will react to the beat of the music.

For this project we will use an Optocoupler

Before we make the project we should learn the materials of the circuit

Then ,we draw the circuit's scheme.

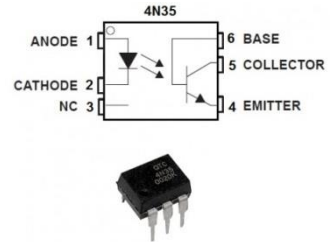
Then, we install the materials.

After installing the circuit, try to put a song and see the LED strip light .

Wiring Materials

A-Optocoupler :

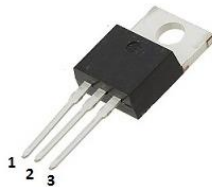
It is an electronic component that interconnects two separate electrical circuits by means of a light sensitive optical interface.



B-Transistor:

A transistor is a semiconductor device used

to amplify or switch electronic signals and electrical power. It is composed of semiconductor material usually with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals controls the current through another pair of terminals. Because the controlled (output) power can be higher than the controlling (input) power, a transistor can amplify a signal.



BD243 pinout

- 1. Base
- 2. Collector
- 3. Emitter

C- LED strip : A strip of LEDs is many LEDs connected in parallel. A LED is a semiconductor device that emits visible light when an electric current passes through it. The light is not particularly bright, but in most LEDs it is monochromatic, occurring at a single wavelength.



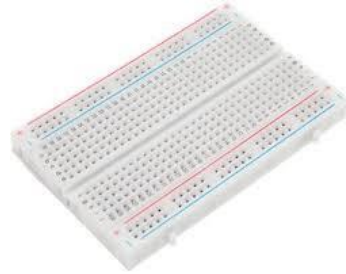
D-Resistor: A resistor is an electrical component that limits or regulates the flow of electrical current in electronic circuit. Resistors can also be used to provide a specific voltage for an active device such as a transistor.



E- Wire: Just a small-size wire used especially for low voltage circuits.



F-Breadboard: A breadboard is a widely used tool to design and test circuits. You don't need to solder wires and components to make a circuit while using breadboard. It is easier to mount components and reuse them.



G-Speakers: They are used as the sound source for the circuit.



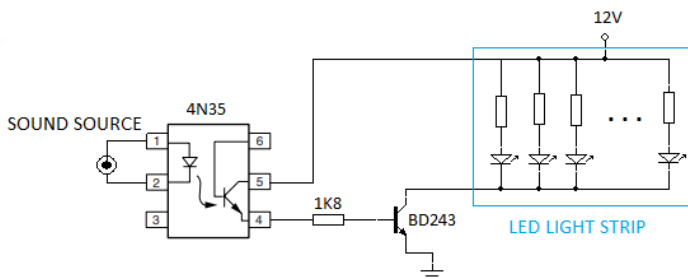
H-Power source: It's responsible for delivering power to the circuit. You can choose a fixed output or use variable outputs.



Step 1- Draw the Electric Scheme

We should draw the electric scheme of circuit.

Circuit Diagram:

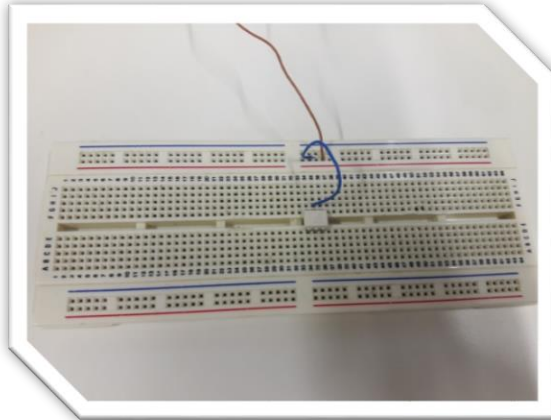


Step 2 – Mount The Materials To the Board

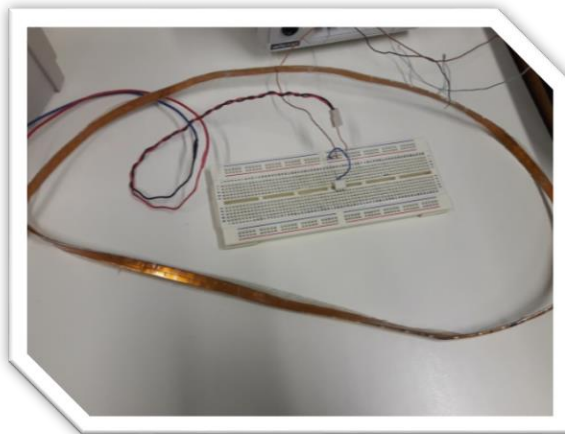
Choose the correct positions for each materials.

- Mount the Optocoupler
- Mount the Transistor
- Mount the Resistor
- Mount the LED strip
- Mount the speakers

Step 3 – Install the Wires

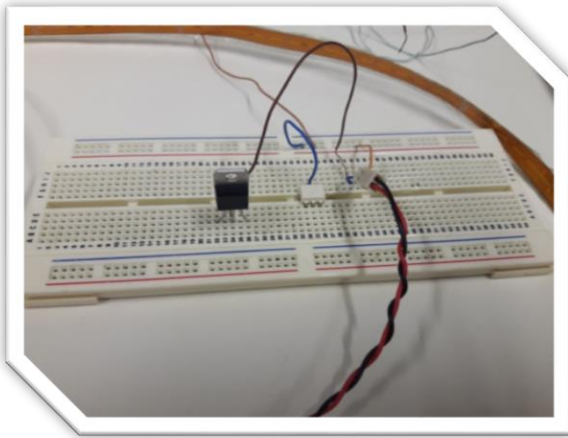


- a. Connect pin 5 of optocoupler to the positive of the power supply

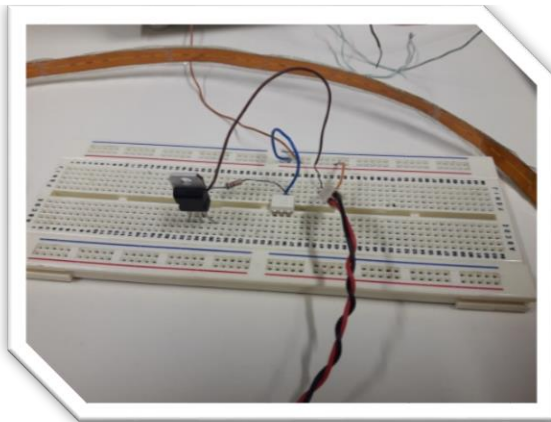


- b. Connect positive wire of LED strip to the positive of the power supply

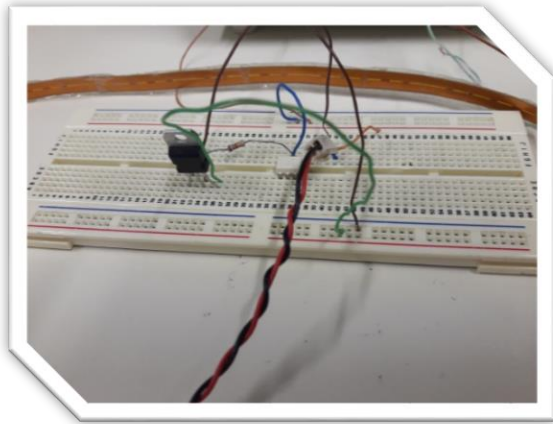




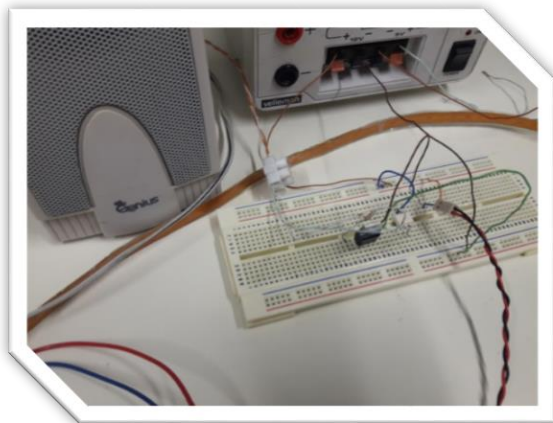
c. Connect negative wire of LED strip to the collector of the transistor



d. Connect resistor to pin 4 of optocoupler and base of transistor

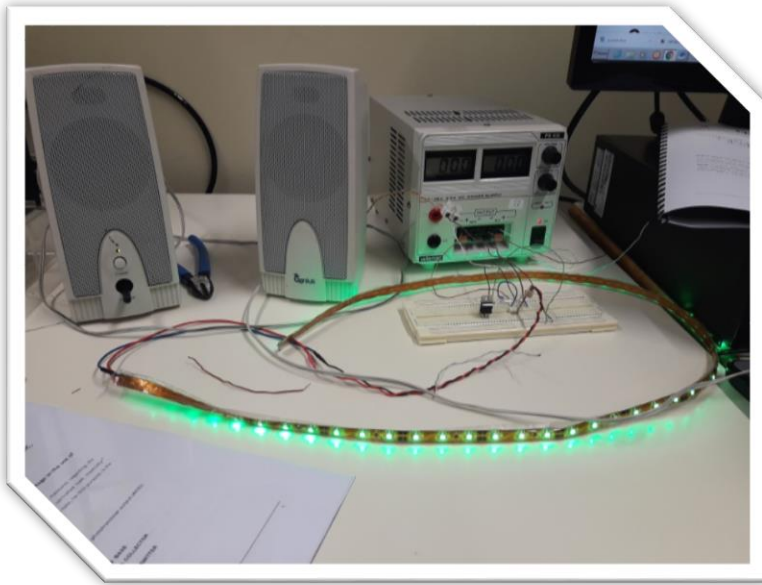


e. Connect the emitter of the transistor to the negative of the power supply



f. Connect positive wire of the speaker to pin 1 and negative wire to pin 2

Step 4 - Test the Circuit



g. Put on some music and watch the LEDs light up to the beat of the music.

Things To Be Aware Of

- I. Be careful to correctly connect wires to the right pins on optocoupler
- II. When connecting the circuit to the speakers be careful not to exceed 50mA and 6V in the input of the optocoupler
- III. Be careful to correctly orient the wires of the speakers
- IV. Make sure you correctly identified the pins of the transistor

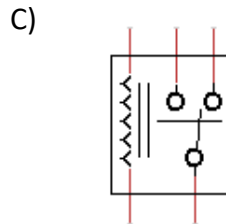
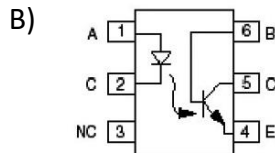
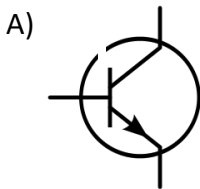


Questions:

- 1) How does the optocoupler work?:
 - A) With LED and Transistor
 - B) With LED and PhotoTransistor
 - C) With 2 LEDs

- 2) What is the function of the transistor in this circuit?:
 - A) It is being used as a switch
 - B) It is being used to amplify power/voltage

- 3) Which one is symbol of optocoupler?



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Hi, I am Ibrahim.

I am electric student from Spain in Canary Island. I like to train boxing and meeting friends. I sometimes participate in boxing tournaments. I like electricity because I find it interesting and when I'm older I would like to work with electricity. I also like watching football and movies.

I think the Electro World Project is very interesting and I have a lot of fun because you can learn many things about electricity and different cultures and languages. This project is a great experience for life.

Urban Mikic

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Hi, I am Urban.

I am an electrical student from Celje, Slovenia. I'm very interested in robots, programming and automating different systems.

My hobbies are sports, music, reading books and learning different things, especially things connected to electricity.

This is my second Erasmus project and I am really excited about it. I joined it because I want to meet new people and see how our profession is taught in other countries.

Tony RICHARD

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Hello, my name is Tony RICHARD.

I have 16 years old.

My hobbies are watching and read manga and video games.

I like play basketball.

My school is situated is in small town, in 2 hours of Paris.
Im in seconde year of high school.

I joined the project because it's a rewarding experience in
the life for travel and for the work.

André Duarte

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Hi, I'm André;

I am in 12th grade in a Electricity, Electronics and Computers course in the secondary school Emídio Navarro.

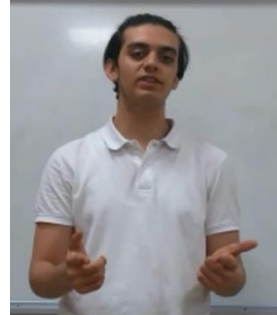
I like to play video games, watching tv series about mysteries and I'm also interested in the Japanese culture. I enjoy electronics because it's a very fascinating and I picked this area because electricity is already our future and because it has many job proposals.

I think this project is a great opportunity to meet people with different cultures, languages and costumes than mine and we get to work together on a common interest.

Enes Malik YETKIN

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Hi, I am Enes and going to

Samandira Vocational and

Technical Anatolian High School,

Im Electrical Electronics student

Department, 12th grade student. I live in Istanbul,

Turkey.

My hobbies is playing basketball, swimming, playing computer games, whatcing film, tv serious,

I love travelling historical places.

My father is a civil servant. My mother is a housewife. My mom The biggest dream in my childhood is to become a good electric-electronic engineer.

I think this project is

a useful project. I recommend everyone to *participate*.

