Sunrise Alarm

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ABSTRACT

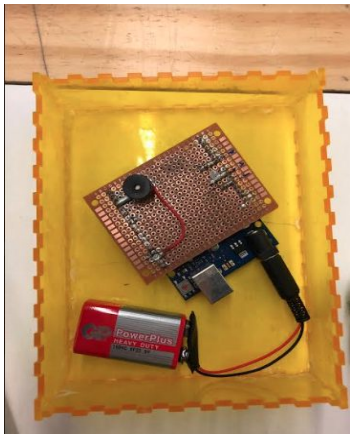
For our Makerspace and Coding classes, we created the sunrise alarm: an alarm meant to make students' lives easier, as we often forget to set our alarms up. The sunrise alarm senses daylight and wakes you up, with the Mario Theme song. People will not have to stress about anything, and as students, it would be one less thing in their minds. This was the group's first contact with an Arduino. We learned a lot of new lessons, such as soldering and coding, but mostly the importance of sharing our experiences with other students of the maker community.

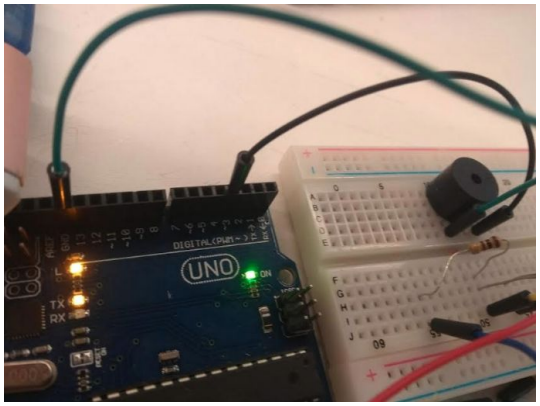
Keywords

Arduino; Sunrise; Alarm; Coding; Input; Output

1. PROJECT DESCRIPTION

1.1 Project Overview





During our Makerspace and Coding classes, we were asked to develop a project that would defeat a hidden “villain”, i. e.something that annoys us in our daily lives. As students, we know pretty well how hard it is to wake up early. Every day, our classmates would be late for class because they slept too much, so we did not need to think too much about what our hidden villain was going to be: we got together to battle lateness.

Even though our phones have alarms, we often forget to set them. Even when we set them and they ring, we sometimes do not hear them. And how annoying are the few sound options that are available? With our project, we strove to find a way for people to not have to stress stress about it and came up with the sunrise alarm, which would have the Mario Theme as its song.

Our code was based on the values transmitted by the photocell, which measured the light sensed in the environment. The higher the values, more light there was. For the project to work, we needed to establish a threshold and use a conditional: when the light level hit a certain value, the buzzer would start playing the Mario Theme; otherwise, it would stay silent. The threshold is uncertain and should be changed for every different place we go because each environment has different lighting. It took us a while to figure out which values we should use. Before we figured that out, the group thought the project was not working.

After clearing up that issue, we connected a printed circuit board to the Arduino board, making it smaller and more practical. We also soldered the buzzer, the jumper wire, the resistor and the light sensor to it. We had a few difficulties in this step but learned a lot of lessons. As most of the group members were really inexperienced, we had to solder everything over and over again, making sure we had done everything correctly. It was really hard, and we had to start over many times!

We also made a box for our alarm, so it would be protected in case of rain. We chose to laser cut it in yellow acrylic because it was see-through and the sensor would be able to sense the light from inside of the box. We used the website www.makercase.com/ to make it. After that, we glued everything together with superglue. We also tried to use hot glue, but it was pretty messy and things would not stick.In the future, we would have used less superglue because it gave our box a dirty appearance.

1.2 Lessons Learned

Most of the group was really inexperienced, and this was the first time we had the chance to play around with an Arduino. We had just started going to a new school, and this was our first contact with Coding and Makerspace. We did not even have the basic tech and crafting skills, but we managed to improve our coding, 3D printing, and Arduino skills during our classes. As the semester passed, we learned more and more about inputs and outputs, basic Arduino codes and the tools available in our workplace. However, to make the project we had in mind, we had to branch out a bit to learn even more.

We wanted to create something that students could actually use in their day-to-day lives, so we dismissed the idea of using a breadboard right away. We could not imagine anyone handling all of those wires. Our teachers helped us come up with a solution: the Printed Circuit Board. We were about to face one of our biggest problems and learn our first lesson: soldering. To use the PCB, we had to solder the wires to it. This was certainly the hardest part of our project. We tried over and over and over again, but something always seemed to get in our way: a misplaced photocell, a Printed Circuit Board that would not fit in the Arduino, broken wires, etc. The deadline was getting closer, and we found ourselves sneaking into the workplace between classes. Eventually, we managed to solder everything.

The variety of content from the maker community on the internet and the help of our teachers were pivotal for this project. We learned that we could look up other students' experiences and gather information that would help us with our own project. We created an Instructables tutorial, to help and possibly inspire some other students as well.

If we were to do this project again, we would add a volume button, making it possible for people to control the volume of the Mario Theme. We would also like to add a 3D printed Mario Universe character and give the alarm a different and original design. One variable we did not take into consideration but will next time was the fact that it is not always sunny outside. With our current clock, people would have to know if it was going to be cloudy to set lower values in the code, which would be really complicated. This is a problem we would definitely work on to improve our project. We also did not think about everything that could happen to the alarm, as it needs to stay outside. Furthermore, if we did the project again, it would be a good idea to connect the photocell to the alarm via Bluetooth.

3. BIOS

Leticia Gorberg Valdetaro

Fourteen years old, the most experienced in the group. She already knew a little bit about makerspace and coding and helped the rest of the group learn more. Had previously studied at Eliezer Max, where she had the very first contact with coding and makerspace skills, which were then improved at Escola Eleva. Greatly interested in both technology and the arts.

Luiza Rocha

Fourteen years old, she had never had any contact with coding or makerspace, but such skills were quickly learned for the project. Had previously studied at Colégio Santo Inácio, which did not teach these subjects in the regular schedule. Greatly interested in design.

Luísa Fernandes Blacker Espozel

Fourteen years old, had little contact with coding and makerspace but really improved these skills for the project. Only had basic crafting skills acquired in a woodworking extracurricular. Before coming to Escola Eleva, had previously studied at Colégio Santo Inácio. Greatly interested in Social Studies.