# Automatic Pet Feeder

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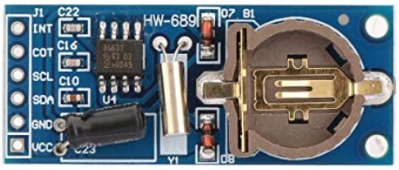
## General Presentation

The purpose of this project is to build an automatic pet feeder that releases food at specific hours. It should come as a handy tool for all pet owners that struggle with feeding their pets on a regular time schedule.
The project is implemented using Arduino technology. For programming the Arduino I have used the default Arduino IDE.

## Components

The microcontroller used for implementing the project is an Arduino Uno Board.

### Rtc-Pcf8563



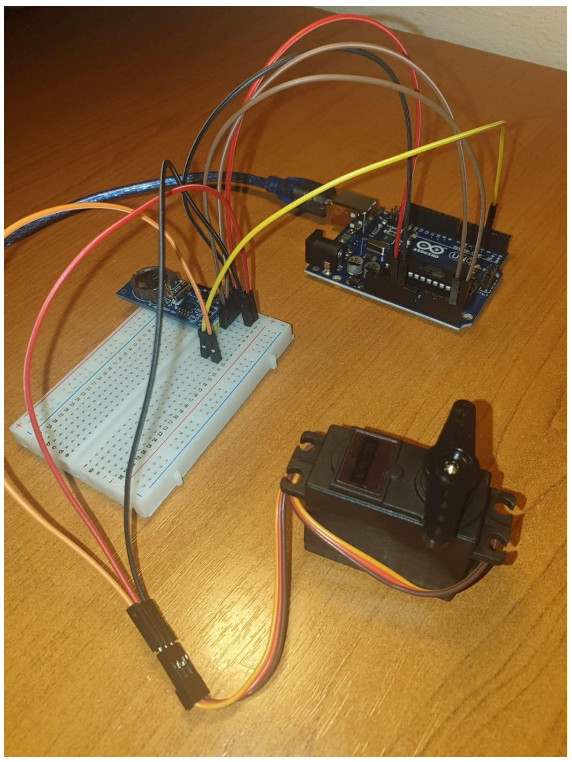

The PCF8563 is a CMOS Real-Time Clock (RTC) and calendar optimized for low power consumption. A programmable clock output, interrupt output, and a voltage-low detector is also provided. All addresses and data are transferred serially via a two-line bidirectional I²C-bus. The maximum bus speed is 400 kbit/s.
This module has 6 pins: INT: interrupt output, COT: Clock output, SCL: Serial Clock Input for I2C protocol, SDA: Serial Data Input / Output for I2C protocol, GND: Ground, VCC: Module power supply – 5V.
In order to use the PCF8563 module the “Rtc_Pcf8563.h” or “RTClib.h” library should be downloaded from the library manager and then added to the project.

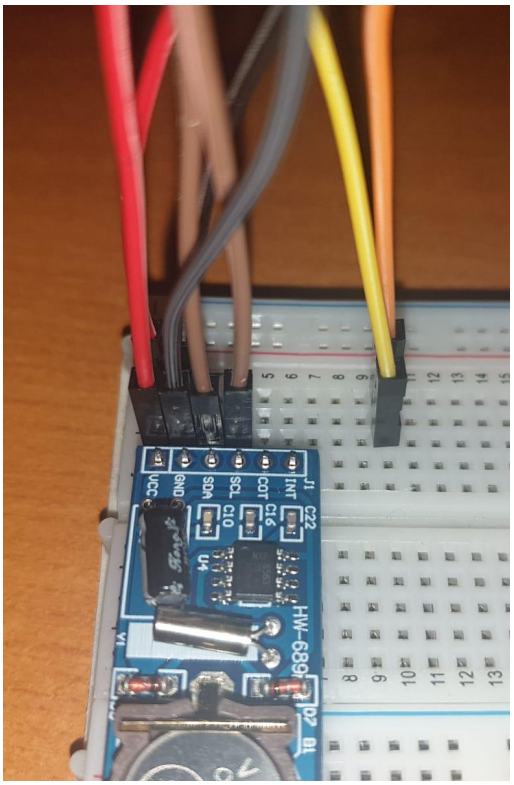
### Servo motor - MG996R

Servo motors have three wires: power, ground, and signal. The power wire should be connected to the 5V pin on the Arduino board. The ground wire should be connected to a ground pin on the Arduino board. The signal pin is orange and should be connected to a digital pin on the Arduino board. This servo is a continuously rotating servo.
In order to use the servo motor the library “Servo.h” has to be included in the project.

# Implementation

## The setup



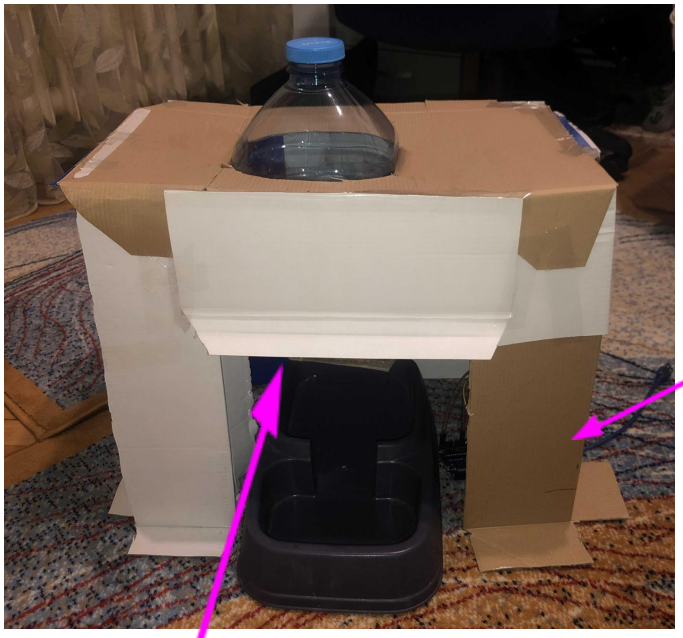


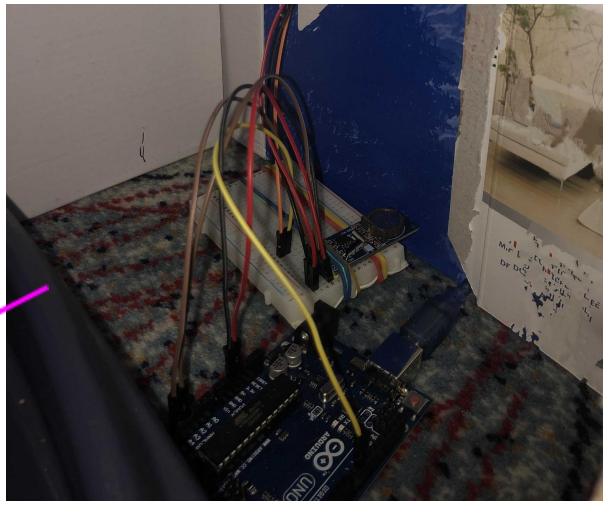

The PCF8563 is connected to the breadboard and then to the Arduino with 4 wires. The VCC is connected to the 5v supply source of the GND to ground, SDA to analog pin 4, and SCA to analog pin 5.
The servo is connected as well to the ground and VCC on the breadboard and also to the digital pin 9.

## Arduino Code

The Arduino code that is loaded on the board contains the following functions:
The setup() where the RTC is initiated and the servo is connected to the corresponding pin.
The loop() function where the time is retrieved from the real-time clock module. If it is the time for feeding the function feedCat() is called, this function activates the servo that will rotate a piece of plastic/cardboard/wood that acts as a cap for the tube from which the food goes to the bowl.
Before loading the actual project code on the board, another code was loaded for writing the time on the chip on the RTC.

**The final project**






The final setup consists of a container with food which is kept closed by a piece of thick cardboard, the servo rotates the piece 360 degrees to let the food pass. The container has an opening with a cap at the top to allow the user to fill it with food. The whole mechanism is encapsulated in a cardboard box.

## Possible Future Developments

One thing that can be improved is the design of the project, the cardboard handmade box could be replaced with a wood box. Also, the bowl in which the food goes could be placed at an angle so that the food comes closer to the “exit” of the box. Another thing would be to add a display and buttons so that the user can set the feeding times, now the feeding times are hardcoded in the code so it is a little bit more time-consuming to modify them.

## Bibliography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