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Even though a fish-only or FO system is typically described as a saltwater aquarium that contains just that, only fish, it is not unusual to also have some algae and detritus eating crustaceans and snails present. These animals are only included if they are compatible with the types of fish you are keeping. No live corals and other sessile or motile invertebrates, and what can be considered to be "live" rock are added, but instead, decorative type rocks, natural dried or synthetic pieces of coral, seashells, artificial plants, and other such items are used. Most any kind of fish "community" is suitable for this type of set up, but this is one most often chosen by aquarists for keeping aggressive or predatory fishes such as Eels, Scorpions/Lions, Triggers, Groupers, Snappers, Puffers, Hawks, Squirrels, Tangs/Surgeons, and Wrasses, as well as large species Angels. Aside from the standard pieces of equipment and components that are required for setting up any saltwater aquarium, here are the fundamental elements of a fish-only setup:

Sufficient Mechanical Filtration: When it comes to keeping any kind of aquarium clean, having good mechanical filtration is essential, but this is especially important if you decide to keep fish that are messy eaters. Typically canister or hang-on-tank style power filters are ideal for this purpose, and you can step things up by buying one that has complete 3-stage filtration capabilities. Filter Buying Tips: Option 1) "Size up" on the filter. For example, if you have a 30-gallon tank, and the filter you are looking at says it is for a 30-gallon, go up to the next size, such as one rated for 50 gallons. Option 2) "Double up" and run two canisters or power filters of the appropriate size. Good Water Movement: It is important to provide good water circulation throughout the aquarium. This aids in the oxygen gas exchange process, allows the aquarium water to be filtered more thoroughly and helps to avoid problems with dead spots in the substrate. Ideally, this can be achieved with a powerhead or two, or less-so by means of using an air pump with stone(s), or a bubble wand. If you desire to do so, a combination of these two elements can be used. If you are planning to upgrade to a reef tank at a later time, you might want to look at the new wavemakers and install one of those. Some of the new wavemakers offer a terrific number of wave-making patterns and intensities which will work quite well for a Fish Only tank. Lighting: Since you only need lighting to enhance the look of the aquarium and the fishes in it, NO (normal output) daylight, actinic, 50/50, and other standard fluorescent bulbs held in a basic aquarium light strip or hood can be used on a fish-only tank. Many new aquarists who are setting up a Fish only tank plan to graduate, over time, to a FO With Live Rock, or even a full reef tank system and will opt for reef grade lighting to begin with as this will eliminate the need to go to the added expense of upgrading their light at a later time. When starting out with a fish-only aquarium, it is a good idea to design your set up with the thought in mind that you may decide to convert the aquarium into a fish-only with live rock or a reef tank system in the future. By choosing to upgrade your filtration and equipment choices in the beginning, these transitions can be made rather easily and will save you money in the long run by not having to buy new pieces of equipment later on, if, or when you decide to advance to the next level. AMR Image / Getty Images Feeding pets (fish/ tortoise) and watering indoor plants are few reasons which make one's out station vacation shorter. This project is aimed at automating both these tasks. The plant pots are equipped with a soil moisture sensor which detects the moisture content of the water in the pots. In the case of a dry pot, water is fed to the pot with a water pump. A fish feeding system is also designed to drop limited quantity of fish food at regular intervals. Arduino UNO R3 x 1 USB Cable x 1 Soil Moisture sensor x 1 Small servo motor x 1 Small breadboard x 1 Relay module x 1 Motor pump x 1 Male to female connecting wires x 20 Male to Male connecting wires x 20 Soil Moisture SensorA soil moisture sensor measures the quantity of water contained in a material, such as soil on a volumetric or gravimetric basis.For soil moisture detection Module has two inputs: • A0, Analog input, which will be connected to Analog pin. • D0, Digital input, connect it to digital pin. • GND of moisture sensor to GND of an Arduino board. • VCC of Moisture sensor to +5V of your Arduino board.Circuit Connections:Connect D0 pin of the soil moisture sensor to the digital pin 13 on the Arduino using male to female connecting wire. Take a male to male wire, connect 1 terminal to the 5V pin on the Arduino and the other terminal of the wire to the breadboard. Now take 1 male to female wire, connect the female terminal on the +5V of the soil Moisture sensor and the male terminal of the wire to the breadboard where you have connect 5V of Arduino on it. Connect the GND of Soil Moisture sensor to the GND of an Arduino Board. Connect the A0 pin of Soil Moisture sensor to the Analog pin A0 on the Arduino Board.Relay ModuleA Relay Module is a device used to switch on/off another device based on a control signal. Relay a VCC, GND and Signal pin on one side of the module. On the other side, relay contains 3 pins which says COM (Common), NC (Normally Closed) and NO (Normally Open).Circuit Connections:Take a motor pump and the socket wire, now connect the neutral wire of pump to NO of the relay with the help of screw driver. Take the neutral wire of the socket wire and connect it to the COM pin of the relay with the help of screw driver. Now connect the remaining wire of socket and pump together. Take 1 female to male wire, connect the output signal of Relay module to the digital pin 7. Now take 1 male to female wire, connect the female terminal on the +5V of the Relay module and the male terminal of the wire to the breadboard where you have connect 5V of Arduino on it. Connect the GND of Relay Module to the GND of an Arduino Board as shown in the figure.Servo Motor:A servo motor is a rotary actuator that allows for precise control of angular position.It consists of a motor coupled to a sensor for position feedback. By varying the pulse width of the output voltage to a servo, you can move a servo to a specific position. There are 3 wires coming out from a Servo motor (brown, red and orange). • Brown wire is GND. • Red wire is +5v. • Orange wire is a Signal wire.Circuit Connections:Servo motor has three TerminalsThe Orange wire of the Servo Motor is the signal Wire which will be connected to Digital Pin 9. The Brown wire of the Servo Motor is the GND Wire which will be connected to GND of the Arduino UNO. The Red wire of the Servo Motor is the VCC wire and it will be connected to the 5V pin of the Arduino UNO. The connections of the Servo Motor will be done using Male to Male connecting wire.After uploading the code, connect the Arduino via USB to your PC and click on upload button to upload your program in Arduino. Motor is turned on and off according to the moisture and humidity in soil. Every 6 seconds fish will get food,you can change the timer according to your requirement.Soil_Moisture.ino This instructable was created in fulfillment of the project requirement of the Makecourse at the University of South Florida (www.makecourse.com).Materials needed: Arduino Uno R3 Female to Female Wires Breadboard IIC 1602 LCD IIC Cable IR Receiver IR Remote 10k Resistor SG90 9G Servo 1/8 inch thick Acrylic (at least 8"x 3D printing plastic 5 #10x3/4" screws (for acrylic and plastic parts) 4 #4-40x1/2" screws with nuts (for LCD screen) 4 M3X5 screws (for Arduino) Super glue (I used Loctite Professional Liquid) AC/DC wall adapter (to plug the Arduino into the wall)Hot glue sticksEquipment needed:3D printer Screwdriver Computer with Inventor Laser Cutter Drill and bits Hot glue gunPrint the .stl files attached with a 3D printer; I used a MakerBot with 100 micron resolution.Load the attached Arduino sketch onto the Arduino. If you are using a different remote than I used, you will have to change the codes in the case structure of the sketch. You will do this by opening the serial monitor while the Arduino is plugged in and the IR sensor is connected. Press each button you intend to use and replace my codes with the codes you see.For help, visit the file titled Acrylic Cover.dwg and raster the angelfish image if desired. I used a 100W laser cutter, the settings were as follows:Vector cut - 2 passes, 30 power Raster - 27.5 power, 80% speedAcrylic Cover.dwgAssemble the electronic components according to the schematic above. The resistor should be 10k. Make the project neater by using only the power rail of the breadboard and soldering the rest or solder everything.Use 2 #10x3/4" screws and the drill to attach "Box part 1" to "Box part 2"Feed the AC/DC adapter through the hole in the right half of the box. Plug this into the Arduino.Mount the Arduino with the 4 M3X5 screws.Super glue the "Lever arm" that you printed to the arm that came with the servo.Insert the servo motor into the rectangular cutout on the bottom of the right half of the box. Orient it so that the shaft is farther left. Secure the motor with hot glue.Attach the servo arm to the servo, using something sturdy and thin will help with this process.Using the 4 #4-40x1/2" screws with nuts, mount the LCD screen to the acrylic lid. Make sure the LCD screen faces outward and that it's on the right side of the box. Double check that all wires are still attached. Use the remaining 3 #10x3/4" screws to secure the acrylic lid to the box.Fill the left side of the box with fish food.

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