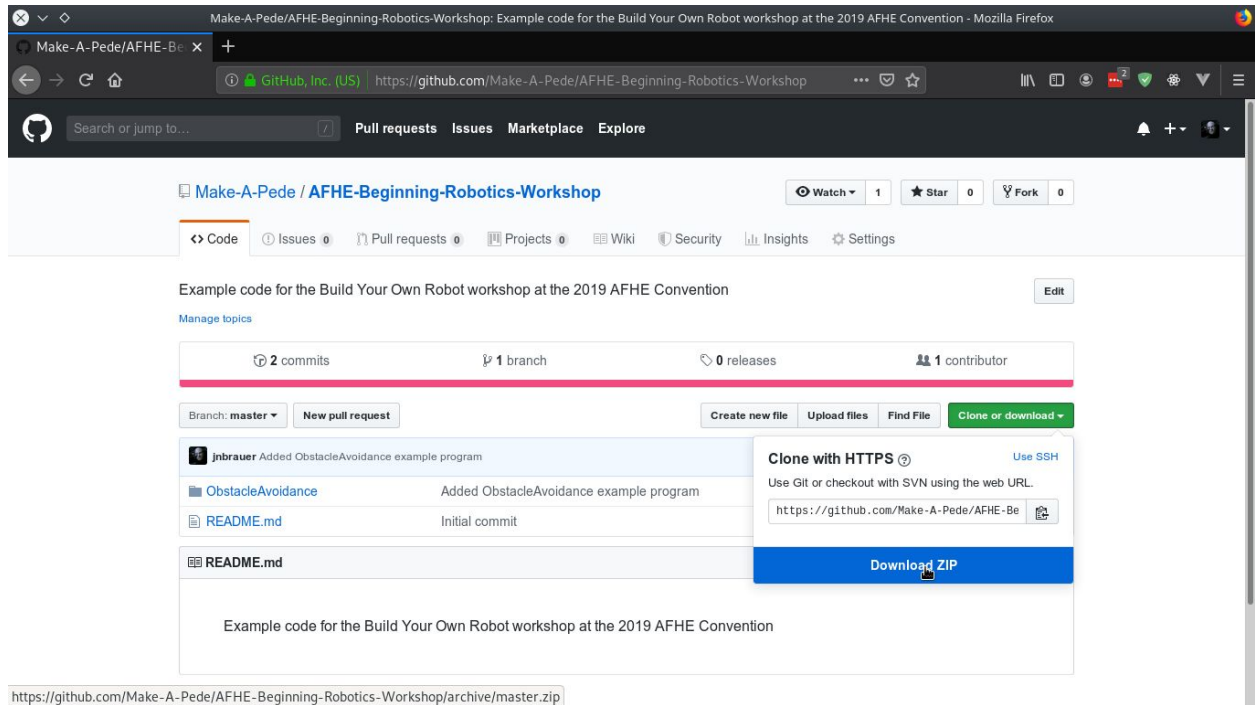


Loading Your First Program

Step 1: Download the example program from the Github repository (<https://github.com/Make-A-Pede/AFHE-Beginning-Robotics-Workshop>) by clicking Clone or Download → Download ZIP. Extract the downloaded .zip file.



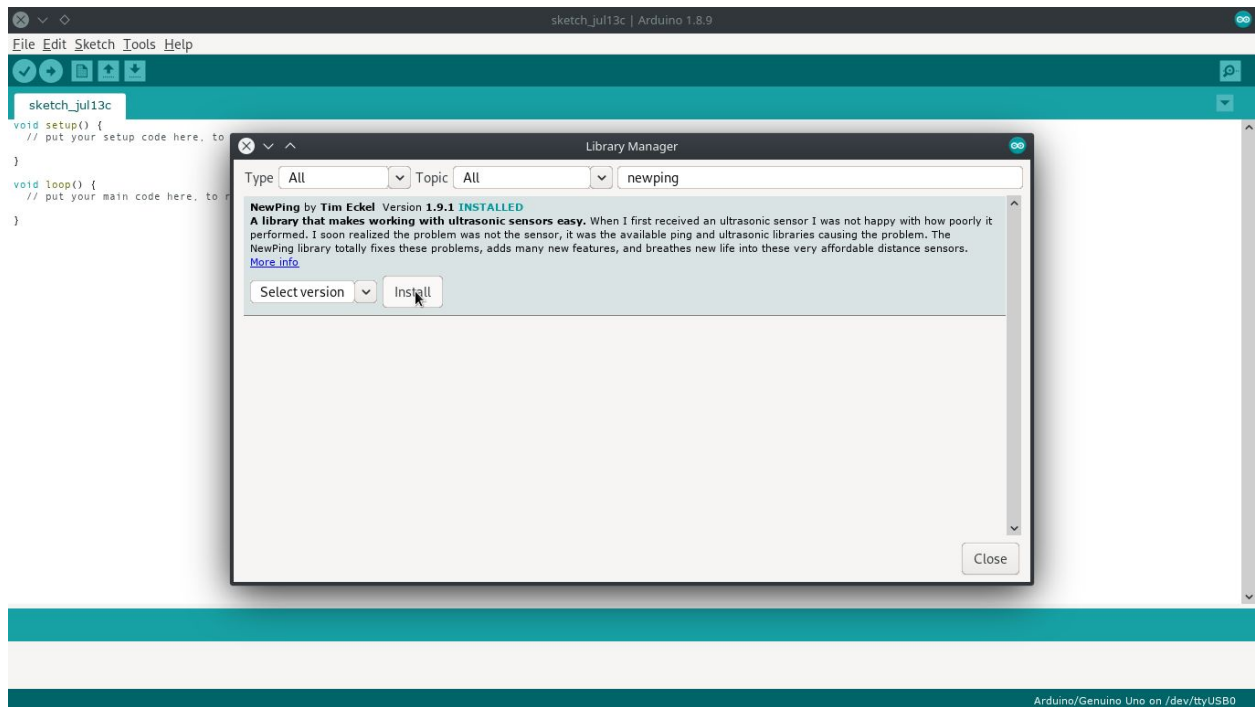
Step 2: Install and open the Arduino IDE.

Arduino IDE Installation Instructions:

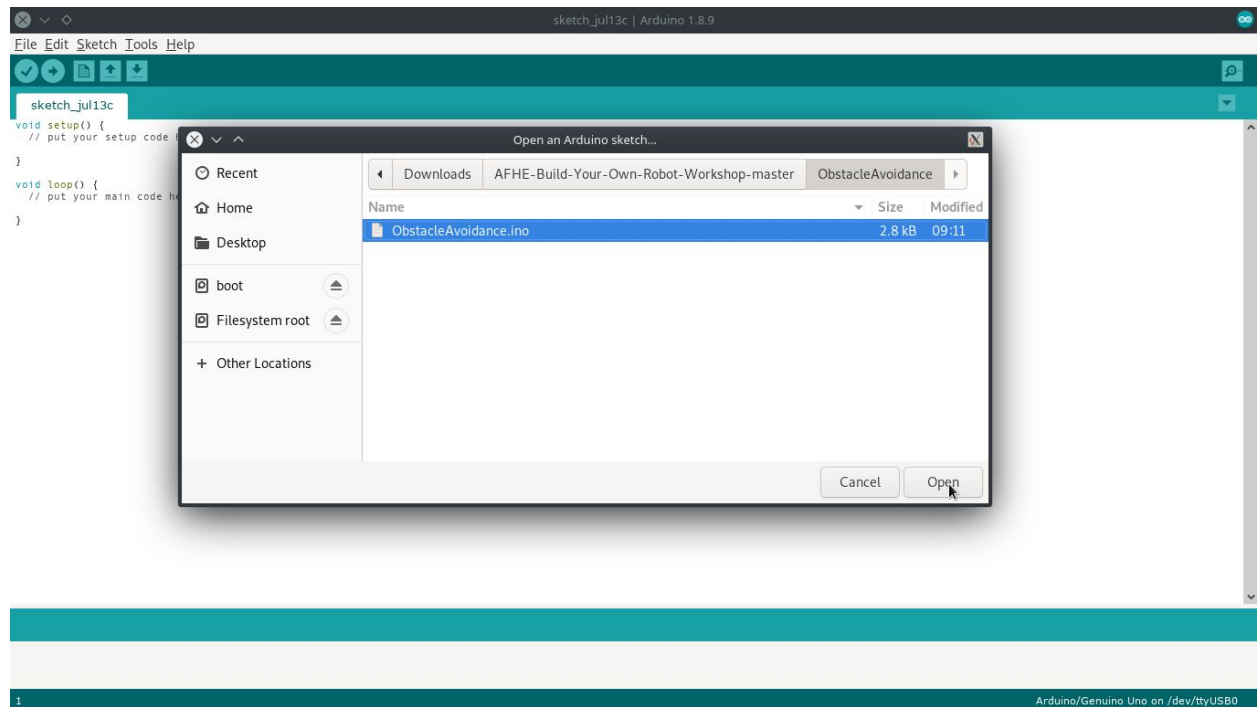
<https://www.arduino.cc/en/Guide/Windows>

<https://www.arduino.cc/en/Guide/MacOSX>

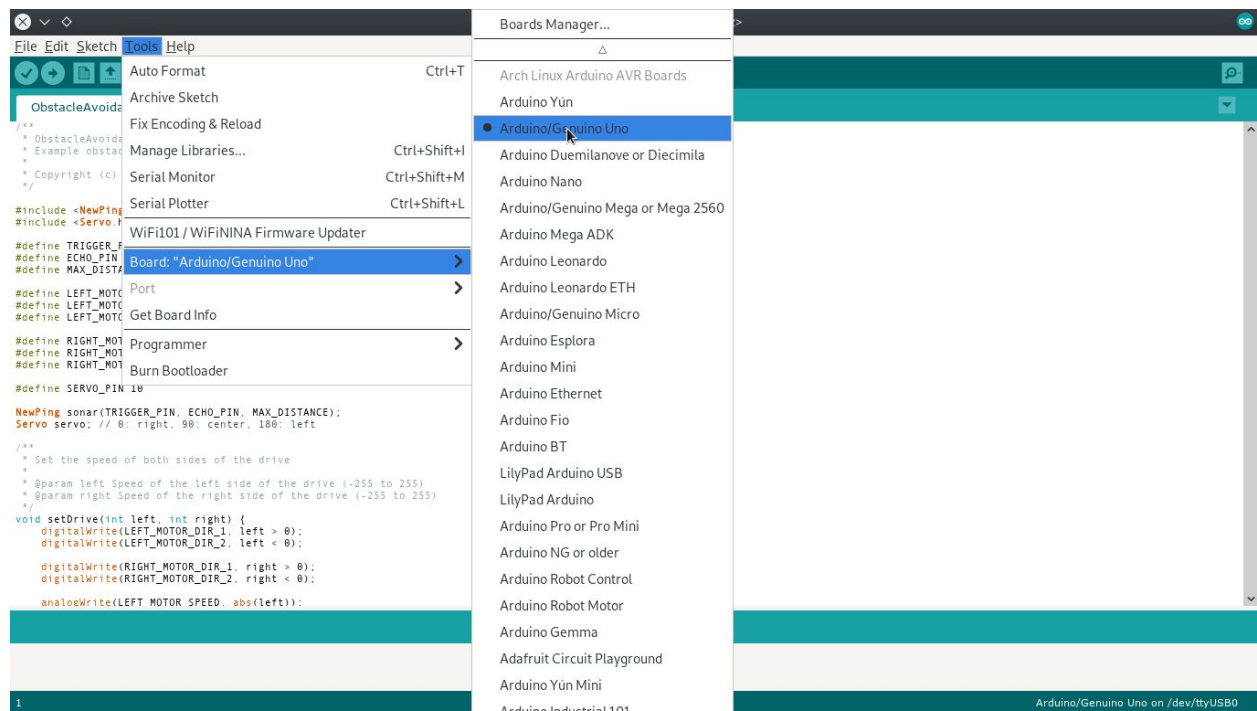
Step 3: Install the NewPing and Servo libraries. To do this, click Sketch → Include Library → Manage Libraries... and search for and install the NewPing and Servo libraries.



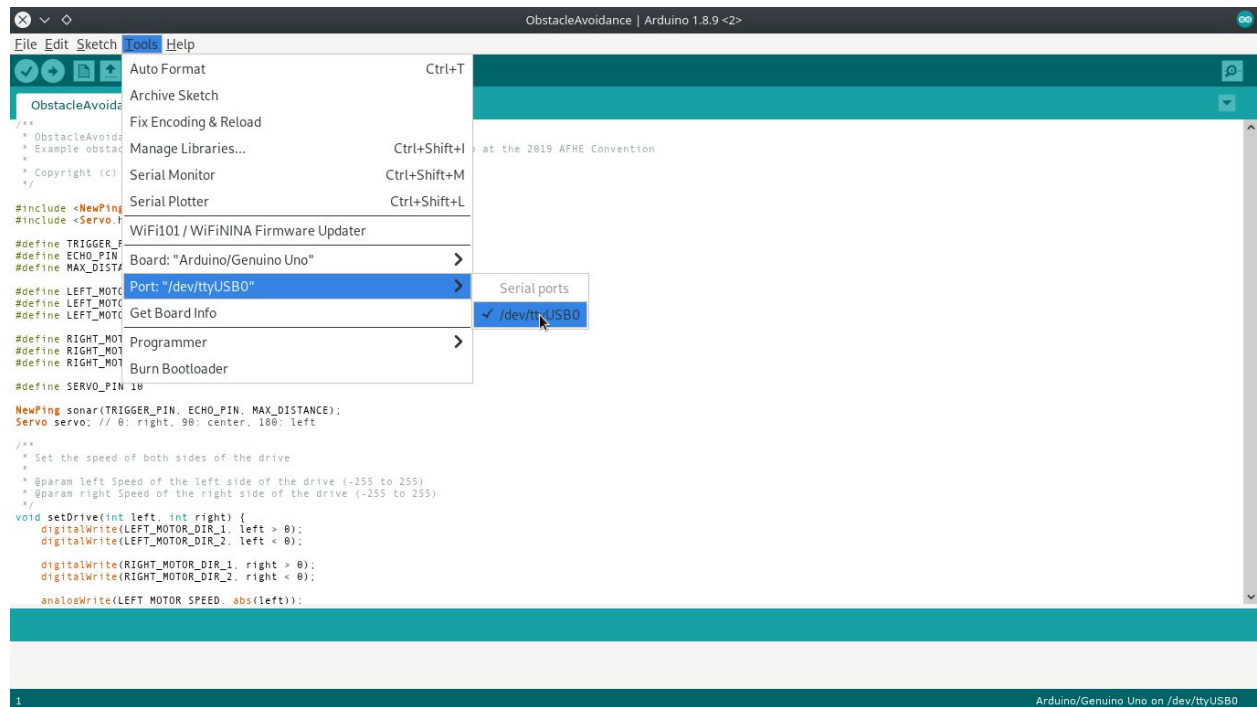
Step 4: Open the example program downloaded in Step 1 by clicking File → Open... and selecting the ObstacleAvoidance.ino file contained in the ObstacleAvoidance folder inside the folder the .zip file downloaded in the first step was extracted into.



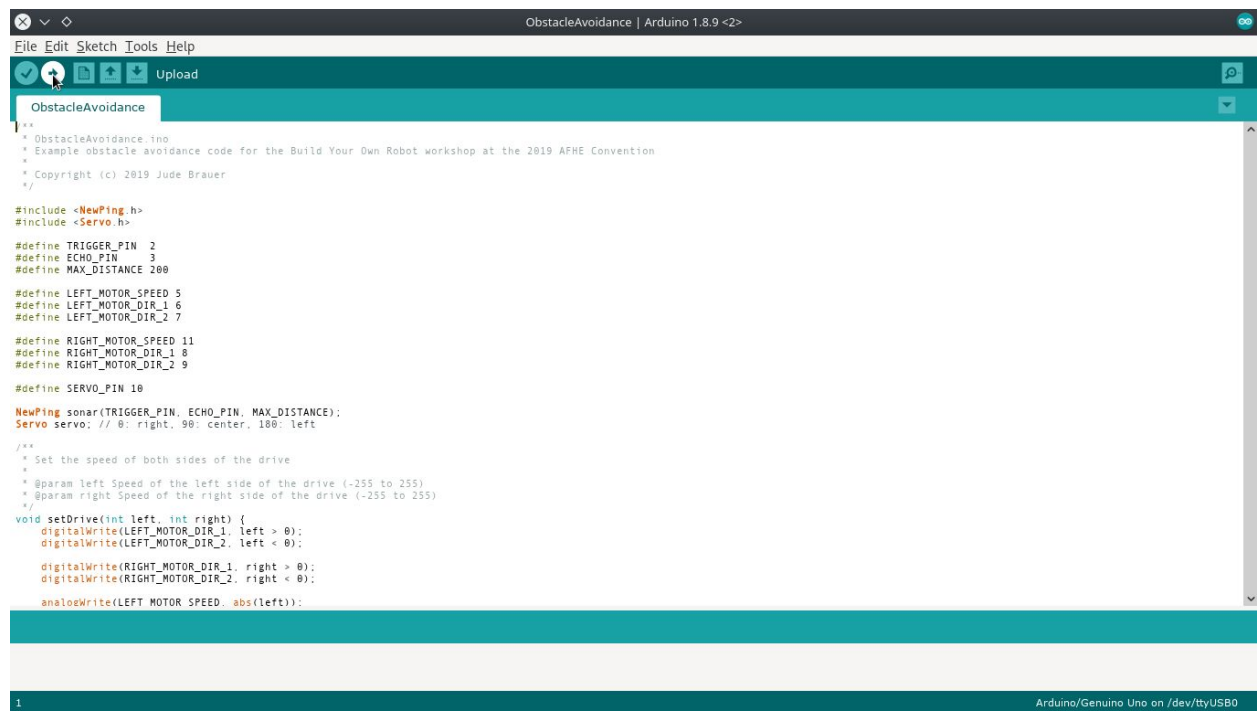
Step 5: Select “Arduino/Genuino Uno” from the Tools → Board menu.



Step 6: Connect the robot to your computer using the download cable provided and select the port the robot is connected to in the Tools → Port menu.



Step 7: Upload the program to your robot.



The screenshot shows the Arduino IDE interface. The title bar indicates the file is 'ObstacleAvoidance | Arduino 1.8.9 <2>'. The menu bar includes 'File', 'Edit', 'Sketch', 'Tools', and 'Help'. The toolbar shows icons for opening files, saving, and uploading, with the 'Upload' button highlighted. Below the toolbar, a tab labeled 'ObstacleAvoidance' is active. The main text area contains the following C++ code:

```
/**
 * ObstacleAvoidance.ino
 * Example obstacle avoidance code for the Build Your Own Robot workshop at the 2019 AFHE Convention
 *
 * Copyright (c) 2019 Jude Brauer
 */

#include <NewPing.h>
#include <Servo.h>

#define TRIGGER_PIN 2
#define ECHO_PIN 3
#define MAX_DISTANCE 200

#define LEFT_MOTOR_SPEED 5
#define LEFT_MOTOR_DIR_1 6
#define LEFT_MOTOR_DIR_2 7

#define RIGHT_MOTOR_SPEED 11
#define RIGHT_MOTOR_DIR_1 8
#define RIGHT_MOTOR_DIR_2 9

#define SERVO_PIN 10

NewPing sonar(TRIGGER_PIN, ECHO_PIN, MAX_DISTANCE);
Servo servo; // 0: right, 90: center, 180: left

/**
 * Set the speed of both sides of the drive
 *
 * @param left Speed of the left side of the drive (-255 to 255)
 * @param right Speed of the right side of the drive (-255 to 255)
 */
void setDrive(int left, int right) {
  digitalWrite(LEFT_MOTOR_DIR_1, left > 0);
  digitalWrite(LEFT_MOTOR_DIR_2, left < 0);

  digitalWrite(RIGHT_MOTOR_DIR_1, right > 0);
  digitalWrite(RIGHT_MOTOR_DIR_2, right < 0);

  analogWrite(LEFT_MOTOR_SPEED, abs(left));
}
```

At the bottom of the IDE, a status bar shows '1' on the left and 'Arduino/Genuino Uno on /dev/ttyUSB0' on the right.