Arduino Coding Pre-Practical Assignment (Kieron Foo Kai-En)

Table of contents is designed for easy access to the different code sections

Some videos are uploaded onto youtube and some are on google drive as the video takes very long to process via google drive

1. **Hello World**

Code:

```
/*
  Blink

  Turns an LED on for five seconds, then off for three second, repeatedly.

  Most Arduinos have an on-board LED you can control. On the UNO, MEGA and ZERO
  it is attached to digital pin 13, on MKR1000 on pin 6. LED_BUILTIN is set to
  the correct LED pin independent of which board is used.
  If you want to know what pin the on-board LED is connected to on your Arduino
  model, check the Technical Specs of your board at:
  https://www.arduino.cc/en/Main/Products

  modified 8 May 2014
  by Scott Fitzgerald
  modified 2 Sep 2016
  by Arturo Guadalupi
  modified 8 Sep 2016
  by Colby Newman

  This example code is in the public domain.

  https://www.arduino.cc/en/Tutorial/BuiltInExamples/Blink
*/

// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(9, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(9, HIGH);  // turn the LED on (HIGH is the voltage level)
  delay(5000);                      // wait for 5 seconds
  digitalWrite(9, LOW);   // turn the LED off by making the voltage LOW
```

```
  delay(3000);                      // wait for 3 seconds
}
```

Description:

Turns on LED Output - L9 for 5 seconds (HIGH) and off for 3 seconds (LOW), repeatedly.

To copy this code, head to Arduino IDE > Examples > 01.Basic > Blink

Delete the code and repaste sheet with this code. The code will play by itself once uploaded.

Video Evidence:

This is what the code should look like when played

https://drive.google.com/file/d/1d4r7c0aGRvHSgfB8wECKuoI98hmpwoGs/view?usp=sharing

2. **Programmable Button Challenge**

Code:

```
/*
  Input Pull-up Serial
 Turns on LED for 5 blinks via programmed button, before turning off.
  This example demonstrates the use of pinMode(INPUT_PULLUP). It reads a digital
  input on pin 2 and prints the results to the Serial Monitor.

  The circuit:
  - momentary switch attached from pin 2 to ground
  - built-in LED on pin 13

  Unlike pinMode(INPUT), there is no pull-down resistor necessary. An internal
  20K-ohm resistor is pulled to 5V. This configuration causes the input to read
  HIGH when the switch is open, and LOW when it is closed.

  created 14 Mar 2012
  by Scott Fitzgerald

  This example code is in the public domain.

  https://www.arduino.cc/en/Tutorial/BuiltInExamples/InputPullupSerial
*/

void setup() {
  //start serial connection
  Serial.begin(9600);
  //configure pin 2 as an input and enable the internal pull-up resistor
  pinMode(2, INPUT_PULLUP);
  pinMode(5, OUTPUT);
}

void loop() {
  //read the pushbutton value into a variable
  int sensorVal = digitalRead(2);
  //print out the value of the pushbutton
  Serial.println(sensorVal);
```

```
  // Keep in mind the pull-up means the pushbutton's logic is inverted. It goes
  // HIGH when it's open, and LOW when it's pressed. Turn on pin 13 when the
  // button's pressed, and off when it's not:
  if (sensorVal == HIGH) {
    digitalWrite(5, LOW);
  } else {
    for (int i=0; i< 5; i++)
    {
    digitalWrite(5, HIGH);
    delay(500);
    digitalWrite (5, LOW);
    delay(500);
  }
}
}
```

Description:

Turns on and off (Blink) LED Output - L5 for 5 repetitions, before turning it off completely.

To copy this code, head over to Arduino IDE > Examples > 02.Digital > DigitalInputPullup

Delete and repaste the code sheet with the provided code and run.

The code will play via the pressing of the registered programmed button.

Video Evidence:

This is what the code should look like when played

https://www.youtube.com/shorts/yMgcxCTktPo

3. **Make some noise!**

Code:

```
/*
  Melody

  Plays a melody when button is pressed.

  circuit:

  - 8 ohm speaker on digital pin 8

  created 21 Jan 2010

  modified 30 Aug 2011

  by Tom Igoe


  This example code is in the public domain.

  https://www.arduino.cc/en/Tutorial/BuiltInExamples/toneMelody
*/


#include "pitches.h"


// notes in the melody:
int melody[] = {

  NOTE_C4, NOTE_G3, NOTE_G3, NOTE_A3, NOTE_G3, 0, NOTE_B3, NOTE_C4

};
// note durations: 4 = quarter note, 8 = eighth note, etc.:
int noteDurations[] = {

  4, 8, 8, 4, 4, 4, 4, 4

};
```

```
void setup() {
  //start serial connection
  Serial.begin(9600);
  //configure pin 2 as an input and enable the internal pull-up resistor
  pinMode(2, INPUT_PULLUP);
  pinMode(13, OUTPUT);
}
void loop() {
  //read the pushbutton value into a variable
  int sensorVal = digitalRead(2);
  //print out the value of the pushbutton
  Serial.println(sensorVal);

  // Keep in mind the pull-up means the pushbutton's logic is inverted. It goes
  // HIGH when it's open, and LOW when it's pressed. Turn on pin 13 when the
  // button's pressed, and off when it's not:
  if (sensorVal == HIGH) {

    //DO NOTHING!
  } else {
      for (int thisNote=0; thisNote < 8; thisNote++) {

    // to calculate the note duration, take one second divided by the note type.
    //e.g. quarter note = 1000 / 4, eighth note = 1000/8, etc.
    int noteDuration = 1000 / noteDurations[thisNote];
```

```
    tone(8, melody[thisNote], noteDuration);


    // to distinguish the notes, set a minimum time between them.
    // the note's duration + 30% seems to work well:
    int pauseBetweenNotes = noteDuration * 1.30;
    delay(pauseBetweenNotes);
    // stop the tone playing:
    noTone(8);
  }
}
}
```

Description:

Plays a melody when button is pressed.

When the button is pressed, the Output pin - L8 lights up simultaneously as each sound melody is played.

This is hence, a programmable command button-operated melody player. (Piezo Buzzer)

To copy this code, using Arduino IDE > File > Examples > 02.Digital > toneMelody

Delete the “toneMelody.ido” section, and copy and paste this code to the application code sheet.

Leave “pitches.h” undisturbed.

Video Evidence:

This is what the code should look like when played

https://www.youtube.com/shorts/-c2kYzgSax0

4. **Servo Challenge**

Code:

```
/* Sweep
 by BARRAGAN <http://barraganstudio.com>
 This example code is in the public domain.

 modified 8 Nov 2013
 by Scott Fitzgerald
 https://www.arduino.cc/en/Tutorial/LibraryExamples/Sweep
*/

#include <Servo.h>

Servo myservo;  // create servo object to control a servo
// twelve servo objects can be created on most boards

int pos = 0;    // variable to store the servo position

void setup() {
  myservo.attach(9);  // attaches the servo on pin 9 to the servo object
}

void loop() {
  for (pos = 20; pos <= 150; pos += 1) { // goes from 20 degrees to 150 degrees
    // in steps of 1 degree
    myservo.write(pos);              // tell servo to go to position in variable
'pos'
    delay(50);                       // waits 50 ms for the servo to reach the
position
  }
  for (pos = 150; pos >= 20; pos -= 1) { // goes from 150 degrees to 20 degrees
    myservo.write(pos);              // tell servo to go to position in variable
'pos'
    delay(50);                        // waits 50 ms for the servo to reach the
position
  }
  for (pos = 20; pos <= 150; pos += 1) { // goes from 20 degrees to 150 degrees
    // in steps of 1 degree
    myservo.write(pos);              // tell servo to go to position in variable
'pos'
    delay(10);                       // waits 10 ms for the servo to reach the
position
  }
}
```

Description:

- Servo motor will move to position 20 degrees at start of code.
- From 20 degrees, servo motor moves slowly to 150 degrees
- From 150 degrees, servo motor moves slowly back down to 20 degrees
- From 20 degrees, servo motor immediately ramps up back to 150 degrees
- Sequence repeats.

To copy this code, head to Arduino IDE > Files > Examples > Servo > Sweep

Sweep.ino

Delete the example code and replace it with the attached code and upload to run code sequence.

readme.md

Leave undisturbed

Video Evidence:

This is what the code should look like when played

https://drive.google.com/file/d/1Xdt_PAwVICrt_nT9Ct6GGMY0vjvMlO0x/view?usp=sharing

5. **Link to the Folder for all 4 Code Videos in Google Drive**

https://drive.google.com/drive/folders/1FEtl4aLsS-vhxBamkhiN2ASaR0Uh0GjK?usp=sharing