

## Buzzerd Code:

```
/* RickRollBoxCode

AUTHOR: Samantha Lagestee
Copyright 2017 samilagestee at gmail dot com

This program is free software: you can redistribute it and/or
modify it under the terms of the GNU General Public License as
published by the Free Software Foundation, either version 3 of
the License, or (at your option) any later version.

DISCLAIMER: The song "Never Gonna Give You Up" by Rick Astley
is not the creative property of the author. This code simply
plays a Piezo buzzer rendition of the song.
*/

#define a3f 208 // 208 Hz
#define b3f 233 // 233 Hz
#define b3 247 // 247 Hz
#define c4 261 // 261 Hz MIDDLE C
#define c4s 277 // 277 Hz
#define e4f 311 // 311 Hz
#define f4 349 // 349 Hz
#define a4f 415 // 415 Hz
#define b4f 466 // 466 Hz
#define b4 493 // 493 Hz
#define c5 523 // 523 Hz
#define c5s 554 // 554 Hz
#define e5f 622 // 622 Hz
#define f5 698 // 698 Hz
#define f5s 740 // 740 Hz
#define a5f 831 // 831 Hz

#define rest -1

int piezo = 7;
int led = 9;
int button = 2;
int sensor = A0;

volatile int beatlength = 100; // determines tempo
float beatseparationconstant = 0.3;

int threshold;

int a; // part index
int b; // song index
int c; // lyric index
```

```

boolean flag;

// Parts 1 and 2 (Intro)

int song1_intro_melody[] =
{c5s, e5f, e5f, f5, a5f, f5s, f5, e5f, c5s, e5f, rest, a4f, a4f};

int song1_intro_rhythmn[] =
{6, 10, 6, 6, 1, 1, 1, 1, 6, 10, 4, 2, 10};

// Parts 3 or 5 (Verse 1)

int song1_verse1_melody[] =
{ rest, c4s, c4s, c4s, c4s, e4f, rest, c4, b3f, a3f,
  rest, b3f, b3f, c4, c4s, a3f, a4f, a4f, e4f,
  rest, b3f, b3f, c4, c4s, b3f, c4s, e4f, rest, c4, b3f, b3f, a3f,
  rest, b3f, b3f, c4, c4s, a3f, a3f, e4f, e4f, e4f, f4, e4f,
  c4s, e4f, f4, c4s, e4f, e4f, e4f, f4, e4f, a3f,
  rest, b3f, c4, c4s, a3f, rest, e4f, f4, e4f
};

int song1_verse1_rhythmn[] =
{ 2, 1, 1, 1, 1, 2, 1, 1, 1, 5,
  1, 1, 1, 1, 3, 1, 2, 1, 5,
  1, 1, 1, 1, 1, 1, 1, 2, 1, 1, 1, 1, 3,
  1, 1, 1, 1, 2, 1, 1, 1, 1, 1, 1, 4,
  5, 1, 1, 1, 1, 1, 1, 1, 2, 2,
  2, 1, 1, 1, 3, 1, 1, 1, 3
};

char* lyrics_verse1[] =
{ "We're ", "no ", "strangers ", "", "to ", "love ", "", "\r\n",
  "You ", "know ", "the ", "rules ", "and ", "so ", "do ", "I\r\n",
  "A ", "full ", "commitment's ", "", "", "what ", "I'm ", "thinking ", "", "of",
  "\r\n",
  "You ", "wouldn't ", "", "get ", "this ", "from ", "any ", "", "other ", "",
  "guy\r\n",
  "I ", "just ", "wanna ", "", "tell ", "you ", "how ", "I'm ", "feeling", "\r\n",
  "Gotta ", "", "make ", "you ", "understand", "", "\r\n"
};

// Parts 4 or 6 (Chorus)

int song1_chorus_melody[] =
{ b4f, b4f, a4f, a4f,
  f5, f5, e5f, b4f, b4f, a4f, a4f, e5f, e5f, c5s, c5, b4f,
  c5s, c5s, c5s, c5s,
  c5s, e5f, c5, b4f, a4f, a4f, a4f, e5f, c5s,
  b4f, b4f, a4f, a4f,
  f5, f5, e5f, b4f, b4f, a4f, a4f, a5f, c5, c5s, c5, b4f,

```

```

    c5s, c5s, c5s, c5s,
    c5s, e5f, c5, b4f, a4f, rest, a4f, e5f, c5s, rest
};

int song1_chorus_rhythmn[] =
{ 1, 1, 1, 1,
  3, 3, 6, 1, 1, 1, 1, 3, 3, 3, 1, 2,
  1, 1, 1, 1,
  3, 3, 3, 1, 2, 2, 2, 4, 8,
  1, 1, 1, 1,
  3, 3, 6, 1, 1, 1, 1, 3, 3, 3, 1, 2,
  1, 1, 1, 1,
  3, 3, 3, 1, 2, 2, 2, 4, 8, 4
};

char* lyrics_chorus[] =
{ "Never ", "", "gonna ", "", "give ", "you ", "up\r\n",
  "Never ", "", "gonna ", "", "let ", "you ", "down", "", "\r\n",
  "Never ", "", "gonna ", "", "run ", "around ", "", "", "", "and ", "desert ", "",
  "you\r\n",
  "Never ", "", "gonna ", "", "make ", "you ", "cry\r\n",
  "Never ", "", "gonna ", "", "say ", "goodbye ", "", "", "\r\n",
  "Never ", "", "gonna ", "", "tell ", "a ", "lie ", "", "", "and ", "hurt ",
  "you\r\n"
};

void setup()
{
    pinMode(piezo, OUTPUT);
    pinMode(led, OUTPUT);
    pinMode(button, INPUT_PULLUP);
    pinMode(sensor, INPUT);
    attachInterrupt(digitalPinToInterrupt(button), getFaster, FALLING);
    digitalWrite(led, LOW);
    Serial.begin(9600);
    flag = false;
    a = 4;
    b = 0;
    c = 0;
    threshold = analogRead(sensor) + 250;
}

void loop()
{
    int sensorreading = analogRead(sensor);
    if (sensorreading < threshold) { // if bright, play
        flag = true;
    }
    else if (sensorreading > threshold) { // if dark, pause
        flag = false;
    }
}

```

```

}

// play next step in song
if (flag == true) {
    play();
}
}

void play() {
    int notelength;
    if (a == 1 || a == 2) {
        // intro
        notelength = beatlength * song1_intro_rhythmn[b];
        if (song1_intro_melody[b] > 0) {
            digitalWrite(led, HIGH);
            tone(piezo, song1_intro_melody[b], notelength);
        }
        b++;
        if (b >= sizeof(song1_intro_melody) / sizeof(int)) {
            a++;
            b = 0;
            c = 0;
        }
    }
    else if (a == 3 || a == 5) {
        // verse
        notelength = beatlength * 2 * song1_verse1_rhythmn[b];
        if (song1_verse1_melody[b] > 0) {
            digitalWrite(led, HIGH);
            Serial.print(lyrics_verse1[c]);
            tone(piezo, song1_verse1_melody[b], notelength);
            c++;
        }
        b++;
        if (b >= sizeof(song1_verse1_melody) / sizeof(int)) {
            a++;
            b = 0;
            c = 0;
        }
    }
    else if (a == 4 || a == 6) {
        // chorus
        notelength = beatlength * song1_chorus_rhythmn[b];
        if (song1_chorus_melody[b] > 0) {
            digitalWrite(led, HIGH);
            Serial.print(lyrics_chorus[c]);
            tone(piezo, song1_chorus_melody[b], notelength);
            c++;
        }
        b++;
    }
}

```

```
    if (b >= sizeof(song1_chorus_melody) / sizeof(int)) {
        Serial.println("");
        a++;
        b = 0;
        c = 0;
    }
}
delay(notelength);
noTone(piezo);
digitalWrite(led, LOW);
delay(notelength * beatseparationconstant);
if (a == 7) { // loop back around to beginning of song
    a = 1;
}
}

void getFaster() { // decrease beat length in order to increase tempo
    beatlength = beatlength / 2;
    if (beatlength < 20) { // loop back to original tempo
        beatlength = 100;
    }
}
```