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// Small Christmas crib sketch. Type A2 - Autumn 2014 - Release 1.0
// Intended for: XXXXXXXX YYYYYY
// Master board: Arduino Mega 2560 [Timing and functions determination]
// Independent sound card to hear the songs: mikromedia for PIC 32 [A]
// Slave sound card for the songs of birds: mikromedia for PIC 32 [B]
// The communications between the master card and the slave card B are Serial
// The B card contains all the songs of the birds, the crow of the cock,
// the braying of the donkey and the bellowing of the ox.
// Diurnal birds: 4 - 36; nocturnal birds 37 - 41; 42 skylarks
// The pin 5 drives the LED of the sun, the pin 4 the starry sky, the pins 2 and 3
// drive the two microlamps of the building
// 2 --> cock; 1 --> ox; 0 --> donkey; frog --> 3; audio file for the slave player

// Declaration and instantiation of the variables

byte secondi = 0;
byte luce = 0;
word canto = 0;
byte gallo = 0;
byte animale = 0;
byte ritardo = 0;

void setup(){
  // Port 5, ... is initialized as output
  pinMode(5, OUTPUT);
  pinMode(4, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(2, OUTPUT);
  // Inizialitation of the serial port
  Serial.begin(9600);
}

void loop(){
  // Cyclic seconds counter
  ++secondi;

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if (secondi == 231) (secondi = 1);
switch(secondi){
case 2:
    // The stars and the microlamps turn off
    randomSeed(analogRead(0));
    luce = random(1, 100);
    digitalWrite(4, LOW);
    if (luce <51){
        digitalWrite(3, LOW);
    }
    if (luce> 50) {
        digitalWrite(2, LOW);
    }
    break;
case 4:
    if (luce <51){
        digitalWrite(2, LOW);
    }
    if (luce> 50) {
        digitalWrite(3, LOW);
    }
    break;
case 5:
    // the sun turns on
    digitalWrite(5, HIGH);
case 15:
    // First song of a diurnal bird
    // Probability: 1
    randomSeed(analogRead(0));
    canto = random(4, 37);
    Serial.write(canto);
    break;
case 45:
    // braying or bellowing number 1
    // Probability: donkey 0.5 - ox 0.5

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    randomSeed(analogRead(0));
    animale = random(1, 100);
    if (animale > 50) Serial.write(0);
    if (animale < 51) Serial.write(1);
    break;
case 60:
    // Second song of a diurnal bird
    // Probability: 1
    randomSeed(analogRead(0));
    canto = random(4, 37);
    Serial.write(canto);
    break;
case 105:
    // Third song of a diurnal bird
    // Probability: 1
    randomSeed(analogRead(0));
    canto = random(4, 37);
    Serial.write(canto);
    break;
case 111:
    randomSeed(analogRead(0));
    luce = random(1, 5);
    switch (luce){
    case 1:
        ritardo = 1;
    case 2:
        ritardo = 2;
    case 3:
        ritardo = 3;
    case 4:
        ritardo = 4;
    }
    digitalWrite(5, LOW);
    break;
case 113:

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    if (ritardo == 1) {
        digitalWrite(3, HIGH);
    }
    break;
case 115:
    if (ritardo == 1) {
        digitalWrite(2, HIGH);
    }
    digitalWrite(4, HIGH);
    break;
case 117:
    if (ritardo == 2) {
        digitalWrite(2, HIGH);
    }
    break;
case 119:
    if (ritardo == 2) {
        digitalWrite(3, HIGH);
    }
    break;
case 121:
    if (ritardo == 3) {
        digitalWrite(3, HIGH);
        digitalWrite(2, HIGH);
    }
    break;
case 123:
    if (ritardo == 4) {
        digitalWrite(3, HIGH);
    }
    break;
case 125:
    if (ritardo == 4) {
        digitalWrite(2, HIGH);
    }
}
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        break;
case 150:
    // braying or bellowing number 2
    // Probability: donkey 0.5, ox 0.5
    randomSeed(analogRead(0));
    animale = random(1, 100);
    if (animale > 50) Serial.write(0);
    if (animale < 51) Serial.write(1);
    break;
case 165:
    // Song of a nocturnal bird
    randomSeed(analogRead(0));
    canto = random(37, 42);
    Serial.write(canto);
    break;
case 180:
    randomSeed(analogRead(0));
    animale = random(1, 100);
    // Probability of croaking of the frog: 0.3
    if (animale > 70) Serial.write(3);
    break;
case 220:
    randomSeed(analogRead(0));
    gallo = random(1, 100);
    // The probability the cock will sing at dawn is 0.7
    // the skylarks 0.3
    if (gallo > 30) Serial.write(2);
    if (gallo < 31) Serial.write(42);
break;
    }
    delay(1000);
}

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