

```

//setting the note frequencies
int a[] = { 27.5, 55, 110, 220, 440, 880, 1760, 3520, 7040 };
int A[] = { 29.14, 58.27, 116.54, 233.08, 466.16, 932.33, 1864.66, 3729.31, 7458.62 };
int b[] = { 30.87, 61.74, 123.47, 246.94, 493.88, 987.77, 1975.53, 3951.07, 7902.13 };
int c[] = { 16.35, 32.7, 65.41, 130.81, 261.63, 523.25, 1046.5, 2093, 4186.01 };
int C[] = { 17.32, 34.65, 69.3, 138.59, 277.18, 554.37, 1108.73, 2217.46, 4434.92 };
int d[] = { 18.35, 36.71, 73.42, 146.83, 293.66, 587.33, 1174.66, 2349.32, 4698.63 };
int D[] = { 19.45, 38.89, 77.78, 155.56, 311.13, 622.25, 1244.51, 2489.02, 4978.03 };
int e[] = { 20.6, 41.2, 82.41, 164.81, 329.63, 659.25, 1318.51, 2637.02, 5274.04 };
int f[] = { 21.83, 43.65, 87.31, 174.61, 349.23, 698.46, 1396.91, 2793.83, 5587.65 };
int F[] = { 23.12, 46.25, 92.5, 185, 369.99, 739.99, 1479.98, 2959.96, 5919.91 };
int g[] = { 24.5, 49, 98, 196, 392, 783.99, 1567.98, 3135.96, 6271.93 };
int G[] = { 25.96, 51.91, 103.83, 207.65, 415.3, 830.61, 1661.22, 3322.44, 6644.88 };

//for the potentiometer
const int sensorPin = A0;
float sensorValue;
float voltage=5;
const float threshold = 4;

//for the lights
const int lightspeed=20;
const int firstCandle=2;
const int lastCandle=10;
const int Candle1=2;
const int Candle2=3;
const int Candle3=4;
const int Candle4=5;
const int Candle5=7;
const int Candle6=8;
const int Candle7=9;
const int Candle8=10;
const int Shamash=6;
int whichcandle=2;

//for the sound
int speakerPIN=12;
int timeWholeNote=3000;
int timeNote;
float noteFreq;
int fractionNote;
int octave = 4;

// "Chanuka, chanuka" music
const int melody1lengthTune = 50;

```

```

char melody1 [] =
{'g','e','g','g','e','g','e','g','c','b','a','f','d','f','f','d','f','d','f','b','a','g','g','e','g','g','e','g','e','g','c','b','a','b','b','b','
b','b','b','b','g','a','b','c','s'}
;
int melody1Fractions [] =
{8,8,4,8,8,4,8,8,8,8,2,8,8,4,8,8,4,8,8,8,2,8,8,4,8,8,4,8,8,8,2,8,8,4,8,8,4,8,8,8,8,2};
int melody1OtherOctave [] =
{0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0};

// "Bracha" music
const int brachalength = 47;
char bracha [] =
{'c','f','f','g','d','e','f','c','c','A','a','g','f','e','f','g','c','c','f','f','f','f','f','f','d','c','c','c','f','g','a','g','d','e','f','s','d','
e','f'};
int brachaFractions [] =
{8,4,8,8,8,8,2,8,8,4,8,16,16,8,8,4,16,16,4,16,16,16,16,8,8,4,16,16,4,4,2,8,8,8,2,4,2,2,2}
;

int brachaOctave [] = {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};

// ----- SETUP -----

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
  //for the lights
  for (int i=firstCandle; i<=lastCandle; i++)
  {pinMode (i, OUTPUT);
  digitalWrite(i,LOW);}

  //for the sounds
  pinMode (speakerPIN, OUTPUT);
}

// ----- LOOP -----

void loop() {

  // put your main code here, to run repeatedly:

  //first delay until there is enough power
  alloff();
  voltage = 5;
}

```

```

Serial.println(voltage);
while (voltage>threshold)
{
  sensorValue = analogRead (sensorPin);
  voltage = sensorValue *5 / 1023;
  Serial.println(voltage);
  delay(100);
}

```

```

digitalWrite(Shamash,HIGH);
int t1=28;
int t2=36;
for (int j=0; j<brachalength; j++)
{
  Serial.print ("j = ");
  Serial.println (j);
  playNote(j, bracha, brachaFractions,brachaOctave);
  if (j>lightspeed/4) {digitalWrite(Candle1,HIGH);}
  if (j>lightspeed/2) {digitalWrite(Candle2,HIGH);}
  if (j>lightspeed*3/4) {digitalWrite(Candle3,HIGH);}
  if (j>=lightspeed) {digitalWrite(Candle4,HIGH);}
  if ((j>=t1)&(j<=t2))
  {
    if ((j%2)==0) {light124();}
    if ((j%2)==1) {alloff();}
  }
}

```

```

alloff();
t1=10;
t2=18;
int t3=30;
int t4=40;
for (int j=0; j<melody1lengthTune; j++)
{
  //Serial.print ("j = ");
  //Serial.println (j);
  playNote(j, melody1, melody1Fractions,melody1OtherOctave);
  if (j<=t1)
  {
    if ((j%4)==0) {light124();}
    if ((j%4)==1) {alloff();}
    if ((j%4)==2) {light528();}
  }
}

```

```

    if ((j%4)==3) {alloff();}

}

if ((j>t1)&(j<=t2))
{
int y=j-t1;
alloff();
for (int z=firstCandle-1;z<=y+firstCandle;z++)
{
    digitalWrite (z,HIGH);
}
}

if ((j>t2)&(j<=t3))
{
    if ((j%4)==1) {light124();}
    if ((j%4)==2) {alloff();}
    if ((j%4)==3) {light528();}
    if ((j%4)==0) {alloff();}
}

if ((j>t3)&(j<=t4))
{
{
    if ((j%2)==0) {allon();}
    if ((j%2)==1) {alloff();}
}
}

}

}

// ----- PLAYNOTE FUNCTION -----

void playNote (int i,char melody[], int melodyFractions[],int otherOctave [])
{
//Serial.print ("i = ");
//Serial.println (i);
int currentOctave = 0;

```

```

char currentNote;
currentNote = melody [i];
currentOctave = octave + otherOctave [i];

//Serial.print ("currentNote = ");
//Serial.println (currentNote);
if (currentNote == 'a') { noteFreq = a[currentOctave];}
if (currentNote == 'b') { noteFreq = b[currentOctave];}
if (currentNote == 'c') { noteFreq = c[currentOctave];}
if (currentNote == 'd') { noteFreq = d[currentOctave];}
if (currentNote == 'e') { noteFreq = e[currentOctave];}
if (currentNote == 'f') { noteFreq = f[currentOctave];}
if (currentNote == 'g') { noteFreq = g[currentOctave];}
if (currentNote == 'A') { noteFreq = A[currentOctave];}
if (currentNote == 'C') { noteFreq = C[currentOctave];}
if (currentNote == 'D') { noteFreq = D[currentOctave];}
if (currentNote == 'F') { noteFreq = F[currentOctave];}
if (currentNote == 'G') { noteFreq = G[currentOctave];}
if (currentNote == 's') { noteFreq = 50000 ;}

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fractionNote = melodyFractions [i];
timeNote = timeWholeNote/fractionNote;

```

```

if (currentNote == 's')
{
  noTone(speakerPIN);
  delay (timeNote);
}
else
{
  if (currentNote != 0)
  {
    //Serial.print ("noteFreq = ");
    //Serial.println (noteFreq);
    //Serial.print ("timenote = ");
    //Serial.println (timeNote);
    tone (speakerPIN,noteFreq);
    delay (timeNote);
    noTone(speakerPIN);
  }
  else
  {
    noTone(speakerPIN);
    delay(2000);
  }
}

```

```
//noteFreq =  
//noteLength= lengthWholeNote/???  
}
```

```
// ----- LIGHT FUNCTIONS -----
```

```
void alloff ()  
{  
for (int i=firstCandle; i<=lastCandle; i++)  
{pinMode (i, OUTPUT);  
digitalWrite(i,LOW);}  
  
}
```

```
void light124 ()  
{  
alloff;
```

```
digitalWrite(Shamash,HIGH);  
digitalWrite(Candle1,HIGH);  
digitalWrite(Candle2,HIGH);  
digitalWrite(Candle3,HIGH);  
digitalWrite(Candle4,HIGH);  
}
```

```
void light528 ()  
{  
for (int i=firstCandle; i<=lastCandle; i++)  
{pinMode (i, OUTPUT);  
digitalWrite(i,LOW);}  
digitalWrite(Shamash,HIGH);  
digitalWrite(Candle5,HIGH);  
digitalWrite(Candle6,HIGH);  
digitalWrite(Candle7,HIGH);  
digitalWrite(Candle8,HIGH);  
}
```

```
void lightodd ()  
{  
for (int i=firstCandle; i<=lastCandle; i++)  
{pinMode (i, OUTPUT);  
digitalWrite(i,LOW);}  
  
}
```

```
digitalWrite(Candle5,HIGH);  
digitalWrite(Candle1,HIGH);
```

```
digitalWrite(Candle7,HIGH);  
digitalWrite(Candle3,HIGH);  
}
```

```
void lighteven ()  
{  
  for (int i=firstCandle; i<=lastCandle; i++)  
{pinMode (i, OUTPUT);  
digitalWrite(i,LOW);}  
}
```

```
digitalWrite(Candle6,HIGH);  
digitalWrite(Candle2,HIGH);  
digitalWrite(Candle8,HIGH);  
digitalWrite(Candle4,HIGH);  
}
```

```
void allon ()  
{  
for (int i=firstCandle; i<=lastCandle; i++)  
{pinMode (i, OUTPUT);  
digitalWrite(i,HIGH);}  
}
```