

RAGA DETECTOR

DATABASE

```
name=["kanakangi","ratnangi","ganamoorti","vanaspati","manavati","tanarooopi","senavati","hanuma  
values=[3164,3162,3161,3158,3157,3155,3420,3418,3417,3414,3413,3411,3292,3290,3289,3286,3285,32
```

Sample pitch naming

Pitch	F0 (Hz)
C6	1041
F5	700
B4	494
G4	392
E4	330

A=440 Hz standard

```
y=pitchname(184.614)
```

```
y =  
"F#4"
```

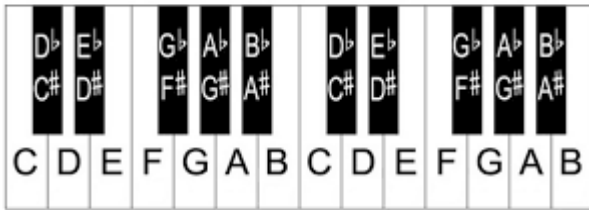
Record the audio, and play

```
fs=44100;  
[song1,fs]=audioread('amajor.wav');  
sound(song1,fs);  
song1;
```

Run the module function and find the musical notes

```
rag=raga(song1,fs);
```

Piano Keys and Notes



www.Piano-Keyboard-Guide.com

```
Notation=["A","A#","B","C","C#","D","D#","E","F","F#","G","G#","A";"S","R1","R2","G2/R3","G3",
rag
```

```
rag = 1x13
      1.0000      0.0130      0.5844      0      0.6104      0.7273      0.0130      0.7922 ...
```

```
scale=Notation(:,rag>0.2)
```

```
scale = 2x7 string array
      "A"      "B"      "C#"      "D"      "E"      "F#"      "G#"
      "S"      "R2"      "G3"      "M1"      "P"      "D2/N1"      "N3"
```

Searching the database using binary weights

```
s=0;
for i=1:12
    if rag(i)>.2
        s=s+2^(12-i);
    end
end
s
```

```
s = 2773
```

```
result=0;
for i=1:30
    if values(i)==s
        result=name(i);
    end
end
result
```

```
result =
"dheera shankarabharanam"
```

$$f=440 \cdot 2^{(n/12)}$$

```

function [y,n]=pitchname(x,fs)
    Notation=["A","A#","B","C","C#","D","D#","E","F","F#","G","G#","A"];
    n=log2(x/440)*12;
    n=round(abs(mod(n,12)))+1;
    y=Notation(n)+join(string(floor(x/440)+4));
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
function y=raga(song,fs)
tmp=[0,0,0,0,0,0,0,0,0,0,0,0,0,0];
song=transpose(song);
for i=(1:1024:length(song)-4196)
    k=song(i:i+1024);
    f=freqcorr(k,fs);
    [m,n]=pitchname(f,fs);
    m;
    tmp(n)=tmp(n)+1;
end
y=tmp;
y=y/max(y);
end

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
function f=freqcorr(song,fs)
temp=xcorr(song);
[p0,t]=findpeaks(temp);
[m,peaks]=max(p0);
f=fs/(t(peaks+1)-t(peaks));
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
function x=record(fs)
beep2();
pause(.5);
x=audiorecorder(fs,8,1);

recordblocking(x,5);

x=getaudiodata(x);
beep2();
%x=nonzeros(x);
end
function beep2()
% Play a sine wave
res = 21000;
len = 0.5 * res;
hz = 220;
sound( sin( hz*(2*pi*(0:len)/res) ), res);
end

```