

In [2]:

```
import librosa
import numpy as np
import matplotlib.pyplot as plt
import librosa.display
import statistics
import IPython.display as ipd
```

In [3]:

```
y_guitar, sr_guitar = librosa.load('A4_guitar.mp3')
y_piano, sr_piano = librosa.load('C4_piano.mp3')
```

In [4]:

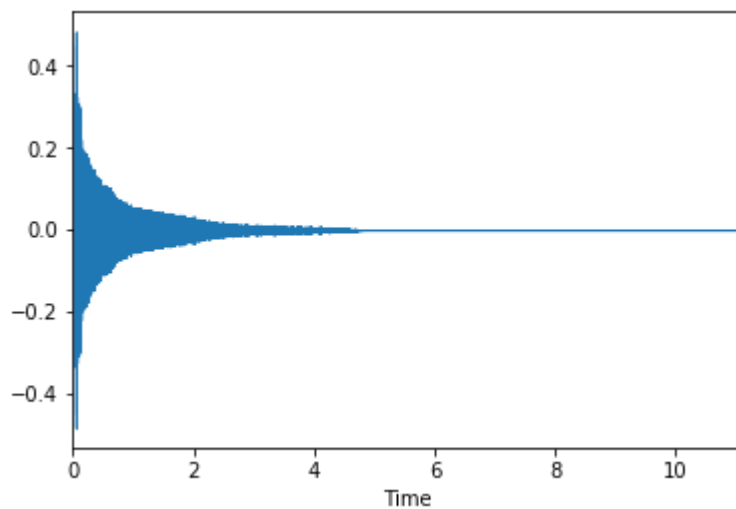
```
S_guitar = np.abs(librosa.stft(y_guitar))
S_piano = np.abs(librosa.stft(y_piano))
```

In [5]:

```
librosa.display.waveplot(y_guitar, sr_guitar)
ipd.Audio(y_guitar, rate=sr_guitar)
```

Out[5]:

0:00 / 0:11

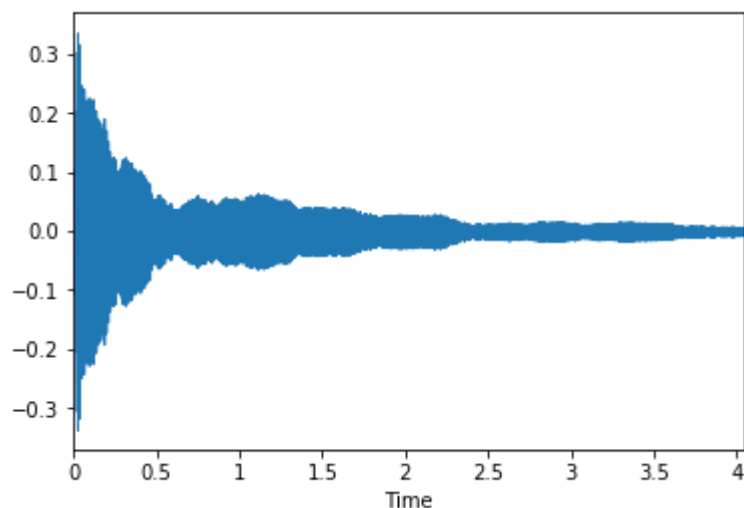


In [7]:

```
librosa.display.waveplot(y_piano, sr_piano)  
ipd.Audio(y_piano, rate=sr_piano)
```

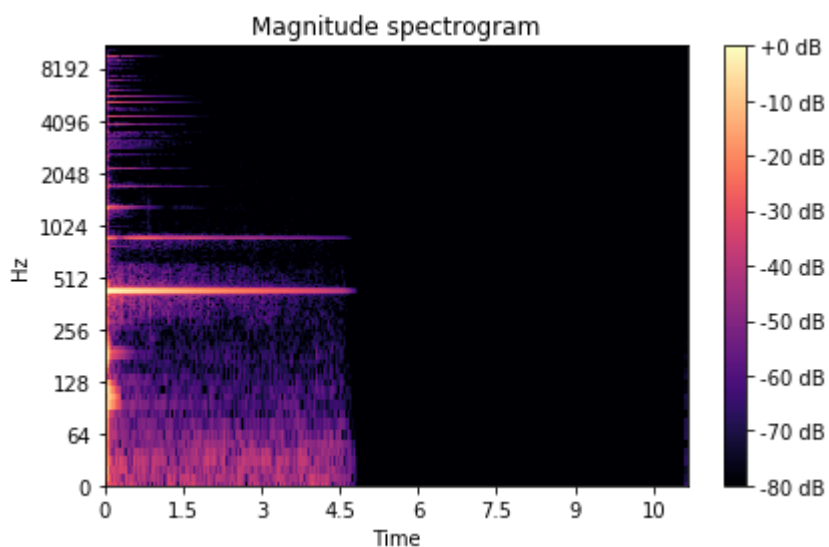
Out[7]:

0:00 / 0:04



In [71]:

```
librosa.display.specshow(librosa.amplitude_to_db(S_guitar, ref=np.max),y_axis='log'  
plt.title('Magnitude spectrogram')  
plt.colorbar(format='%+2.0f dB')  
plt.tight_layout())
```



In [72]:

```
librosa.display.specshow(librosa.amplitude_to_db(S_piano, ref=np.max),y_axis='log',  
plt.title('Magnitude spectrogram')  
plt.colorbar(format='+2.0f dB')  
plt.tight_layout())
```

