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Audio Compression using DCT

```
function SNR=audiocompression(N,percentCoeff,mode)
```

Output/Input Arguments

- SNR = signal to noise ratio
- N = size of window
- percentCoeff = percenatge of DCT coefficients to be picked
- mode = operation mode(0: picks first DCT coefficients, 1: picks dominant DCT coefficients)

Flags

```
%mode0=pick first N% DCT coefficients
%mode1=pick Dominant N% DCT coefficients
%debug1=plots window level plots

debug=0;
soundFlag=0;
```

load audio

```
pathToAudio='/Users/talha/Desktop/DSPlabexam/sample.wav';
[audio, samplingFrequency]=audioread(pathToAudio);
```

Play input audio

```
if soundFlag ==1
```

```
    sound(audio, samplingFrequency)
end
```

Pick N samples

```
samplesToPick=1:N;
thisWindow=0;
reconstructedAudio=[];
```

```
Not enough input arguments.

Error in audiocompression (line 31)
samplesToPick=1:N;
```

Selecting the frames

```
while samplesToPick(length(samplesToPick)) <= length(audio)

    thisWindow=audio(samplesToPick);
    currentDCT=dct(thisWindow);
```

Pick dominant coefficients

```
    if mode==1

        [sortedDCT,ind] = sort(abs(currentDCT),'descend');
        ignoredInd=ind(floor(percentCoeff*length(sortedDCT)):end);
        currentDCT(ignoredInd) = 0;
```

Pick first Coefficients of DCT

```
    elseif mode==0
        currentDCT(floor(percentCoeff*length(currentDCT)):end)=0;

    end
```

Reconstruction

```
    reconstructedWindow = idct(currentDCT);
    reconstructedAudio=[reconstructedAudio;reconstructedWindow];
```

test the reconstructions

```
    if(debug==1)
        plot(thisWindow);
        hold on
        plot(reconstructedWindow);
        pause(1)
        close all
    end
```

Moving the window over the audio to pick next samples

```
        samplesToPick=samplesToPick+N;

    end
```

Calculating SNR

```
    difSig=audio(1:length(reconstructedAudio))-reconstructedAudio;
    SNR = 10*log10(sum(audio.^2)/sum(difSig.^2));
```

play the compressed audio

```
    if(soundFlag==1)
        sound(reconstructedAudio, samplingFrequency)
    end

    end
```

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