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Setup

Constants

```
constants.fs=44100;
                                  % Sampling rate in samples per second
constants.durationScale=.5;
                                 % Duration of notes in a scale
constants.durationChord=1;
                                 % Duration of chords
STDOUT=1;
                                  % Define the standard output stream
STDERR=2;
                                  % Define the standard error stream
notes{1}.note='C4';
notes{1}.start=0;
notes{1}.duration=constants.durationChord*constants.fs;
notes{1}.velocity=1;
notes{2}.note='E4';
notes{2}.start=0;
notes{2}.duration=constants.durationChord*constants.fs;
notes{2}.velocity=1;
notes{3}.note='G4';
notes{3}.start=0;
notes{3}.duration=constants.durationChord*constants.fs;
notes{3}.velocity=1;
instrument.temperament='Equal';
instrument.sound='Additive';
% for just-tempered chords, use the root note and mode to generate
% frequencies rather than a sequence of note names.
instrument.mode = 'Major';
synthTypes={'Additive','Subtractive','FM','Waveshaper'};
```

```
% Questions 1--4 - samples
for cntSynth=1:length(synthTypes)
   instrument.sound=synthTypes{cntSynth};
   [soundSample] = generate sound(instrument, notes{3}, constants);
   fprintf(STDOUT,'For the %s synthesis type...\n',synthTypes{cntSynth});
   fprintf(STDOUT, 'Playing the Sample Note');
   player = audioplayer(soundSample,constants.fs);
   playblocking(player);
   % soundsc(soundSample,constants.fs);
   % When I used soundsc, it all sounds at the same time.
   fprintf('\n');
end % for cntSynth;
% Question 5 - chords
instrument.temperament='Just'; % I added this line because you never go to just
   %I will just assume that the key is C
for cntSynth=1:length(synthTypes)
   % major chords
   instrument.mode = 'Major';
   instrument.sound=synthTypes{cntSynth};
   [soundMajorChordJust] = generate sound(instrument, notes, constants);
   instrument.temperament='Equal';
   [soundMajorChordEqual] = generate sound(instrument, notes, constants);
   % minor chords
   notes{2}.note='Eb4';
   instrument.mode = 'Minor';
   [soundMinorChordEqual] = generate sound(instrument, notes, constants);
   instrument.temperament='Just';
   [soundMinorChordJust] = generate sound(instrument, notes, constants);
   notes{2}.note='E4';
   fprintf(STDOUT,'For the %s synthesis type...\n',synthTypes{cntSynth})
   disp('Playing the Just Tempered Major Chord');
   player = audioplayer(soundMajorChordJust,constants.fs);
   playblocking(player);
   %soundsc(soundMajorChordJust,constants.fs);
   disp('Playing the Equal Tempered Major Chord');
   player = audioplayer(soundMajorChordEqual,constants.fs);
   playblocking(player);
   %soundsc(soundMajorChordEqual,constants.fs);
   disp('Playing the Just Tempered Minor Chord');
   player = audioplayer(soundMinorChordJust,constants.fs);
   playblocking(player);
   %soundsc(soundMinorChordJust,constants.fs);
   disp('Playing the Equal Tempered Minor Chord');
   player = audioplayer(soundMinorChordEqual,constants.fs);
   playblocking(player);
   %soundsc(soundMinorChordEqual,constants.fs);
```

```
fprintf('\n');
```

end % for cntSynth;

```
For the Additive synthesis type...
Playing the Sample Note
For the Subtractive synthesis type...
Playing the Sample Note
For the FM synthesis type...
Playing the Sample Note
For the Waveshaper synthesis type...
Playing the Sample Note
For the Additive synthesis type...
Playing the Just Tempered Major Chord
Playing the Equal Tempered Major Chord
Playing the Just Tempered Minor Chord
Playing the Equal Tempered Minor Chord
For the Subtractive synthesis type...
Playing the Just Tempered Major Chord
Playing the Equal Tempered Major Chord
Playing the Just Tempered Minor Chord
Playing the Equal Tempered Minor Chord
For the FM synthesis type...
Playing the Just Tempered Major Chord
Playing the Equal Tempered Major Chord
Playing the Just Tempered Minor Chord
Playing the Equal Tempered Minor Chord
For the Waveshaper synthesis type...
Playing the Just Tempered Major Chord
Playing the Equal Tempered Major Chord
Playing the Just Tempered Minor Chord
Playing the Equal Tempered Minor Chord
```

Published with MATLAB® R2018a