Prelab 09 Solutions

1.

A	440.00
A#	466.16
B	493.88
C	523.25
C#	554.36
D	587.32
D#	622.24
E	659.24
F	698.44
F#	739.97
G	783.96
G#	830.58
A	880.00

2. samples = 44,100 * 2.5 = 110,250, which is int(R*T)

3.
```
def sample( T=1, H=440, A=1, R=44100):
   N = int(R*T)
   samples = [0] * N
   for i in range(N):
      samples[i] = A * sin(H*2*□*i/R)
```

4. class Soundwave:
   length or T → float
   frequency or H → int
   amplitude or A → int or float
   sampling_rate or R → int
   samples → list of length R*T

5. Possible functions for Soundwave class:
   increaseVolume
   decreaseVolume
   increasePitch
   decreasePitch
   increaseDuration
   decreaseDuration
   addToWave
   subtraceFromWave

6. A-major scale:

A	440.00
B	493.88
C#	554.36
D	587.32
E	659.24
F#	739.97
G#	830.58
A	800.00

7. Frequency of 2nd note = $F * 1.05946^{I1}$
   Frequency of 3rd note = $F * 1.05946^{(I1+I2)}$

8.
```
def produceScale( F, intervalList)
   scale = [F]
   semitoneCount = 0
   loop from 1 to (length of intervalList + 1):
      semitoneCount = semitoneCount + intervalList[i]
      nextNote = F * 1.05946^semitoneCount
      append nextNote to scale
   return scale
```

9.
```
import random

def generateMinuet:
   minuet = []
   measures = 16
   for m in range(measures):
      snippet = random.randint(0,10)
      minuet.append(mTable[snippet][m])
   return minuet

def generateTrio:
   trio = []
   measures = 16
   for m in range(measures):
      snippet = random.randint(0,10)
      minuet.append(tTable[snippet][m])
   return trio
```