

Lab 1 Assignment  
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Assignment 1:

No document needs to submit

Assignment 2:

1.2. See fileLab\_1\_ASGMNT\_2\_1\_kwc305.py, it have 2 sorting method, include bubble sort and insertion sort. And I print out the file. I generate 2 random number list range from 1 to 100, and then do the bubble sort and insertion sort.

3.For the time complexity, both two method have the same time complexity  $n^2$ . So, it should have the same time.

```
bubble sort
original: [96, 38, 42, 12, 40, 29, 22, 2, 42, 80]
[38, 42, 12, 40, 29, 22, 2, 42, 80, 96]
[38, 12, 40, 29, 22, 2, 42, 42, 80, 96]
[12, 38, 29, 22, 2, 40, 42, 42, 80, 96]
[12, 29, 22, 2, 38, 40, 42, 42, 80, 96]
[12, 22, 2, 29, 38, 40, 42, 42, 80, 96]
[12, 2, 22, 29, 38, 40, 42, 42, 80, 96]
[2, 12, 22, 29, 38, 40, 42, 42, 80, 96]
[2, 12, 22, 29, 38, 40, 42, 42, 80, 96]
[2, 12, 22, 29, 38, 40, 42, 42, 80, 96]
[2, 12, 22, 29, 38, 40, 42, 42, 80, 96]
-----
insertion sort
original: [65, 3, 81, 86, 45, 9, 37, 53, 19, 87]
[65, 65, 81, 86, 45, 9, 37, 53, 19, 87]
[3, 65, 81, 86, 86, 9, 37, 53, 19, 87]
[3, 65, 81, 81, 86, 9, 37, 53, 19, 87]
[3, 65, 65, 81, 86, 9, 37, 53, 19, 87]
[3, 45, 65, 81, 86, 86, 37, 53, 19, 87]
[3, 45, 65, 81, 81, 86, 37, 53, 19, 87]
[3, 45, 65, 65, 81, 86, 37, 53, 19, 87]
[3, 45, 45, 65, 81, 86, 37, 53, 19, 87]
[3, 9, 45, 65, 81, 86, 86, 53, 19, 87]
[3, 9, 45, 65, 81, 81, 86, 53, 19, 87]
[3, 9, 45, 65, 65, 81, 86, 53, 19, 87]
[3, 9, 45, 45, 65, 81, 86, 53, 19, 87]
[3, 9, 37, 45, 65, 81, 86, 86, 19, 87]
[3, 9, 37, 45, 65, 81, 81, 86, 19, 87]
[3, 9, 37, 45, 65, 65, 81, 86, 19, 87]
[3, 9, 37, 45, 53, 65, 81, 86, 86, 87]
[3, 9, 37, 45, 53, 65, 81, 81, 86, 87]
[3, 9, 37, 45, 53, 65, 65, 81, 86, 87]
[3, 9, 37, 45, 53, 53, 65, 81, 86, 87]
[3, 9, 37, 45, 45, 53, 65, 81, 86, 87]
[3, 9, 37, 37, 45, 53, 65, 81, 86, 87]
172-16-25-188:DSP KMC5
```

### Assignment 3:

1. see sample16bit.wav
2. see Lab\_1\_ASGMT\_3\_2\_kwc305.py file
3. For this problem, see the file required.py, I combine the 8, 16, 32bit sample record file into one code file, which provide 3 output.

```
172-16-25-188:DSP KWC$ python recoder.py
16bit
channel: 1
framerate 44100
frames: 184320
width: 2
8bit
channel: 1
framerate 44100
frames: 126976
width: 1
32bit
channel: 1
framerate 44100
frames: 307200
width: 4
172-16-25-188:DSP KWC$
```

4. The frame size and is the sample width because this audio record is monotonic  
16bit's width is 2

Depends on how many channels it use to record

width value = byte per sample \* numbers of channels

since in the file I use mono channel to record, 8bit's width is 1, 16 and 32 bit is 2 and 4