# Quiz 8

To get credit for this quiz, use the Quiz tool at eee.uci.edu to enter your answers, within the Sunday-to-Tuesday quiz period.

There is a copy of the original ICStunes music manager program on the web at:

`http://www.ics.uci.edu/~kay/python/ICStunes0.py` .

Open this file in a separate window; you will need to refer to it for this quiz.

**Problem 1** (4 points)

Fill in each blank below with one data type from this group:

int float bool str list namedtuple tuple set dict Song Album Songdisplay

What data structure does the ICStunes code use to represent:

... the music collection? a _____ of _____

... a single track on an album? a _____ called _____

... a single song along with info about that song's album? a _____ called _____

... the collection of songs on an album? a _____ of _____

**Problem 2** (5 points)

Write the necessary code to sort the collection `MUSIC` into alphabetical order by the album artist's name. Following the existing code, this should consist of one statement plus one short function definition.

**Problem 3** (9 points)

**(a)** (5 points) Write the function `Album_average_length` that takes an album and returns the average length in seconds of a song on that album (as a float). If any of the functions already defined in the file are useful, you should use them for full credit.

**(b)** (4 points) Write the one statement that will sort the collection MUSIC in order by the average length of each album's songs, greatest average first.

**Problem 4** (3 points)

The function `top_n_played` (the last definition in the file) uses `play_count_from_songdisplay` as the key argument to the `sort` method. Why doesn't it use `Song_play_count` instead?

**Problem 5** (6 points)

In the code below, fill in each blank with one identifier, constant, or operator, consistent with the function header and docstring.

```
def collection_search(C: [Album], search_for: str) -> [Songdisplay]:
    ''' Return a list of songdisplays that include (in the album title, artist,
        or song title) the specified string
    '''
    SDL = _________________(C)
    result = [ ]
    for sd in SDL:
        if (_________________ in sd._________________ or
            _________________ in sd._________________ or
            _________________ in sd._________________):
            result._________________(_________________)
    return result
```

**Problem 6** (3 points)

Lab Assignment 8 described three categories of operations: mapping, filtering, and reducing. Below are three tasks on a collection of albums in the ICStunes music manager; identify which is a mapping operation, which is filtering, and which is reducing. There's exactly one of each.

**(a)** From a list of numbers representing the play-counts of each song in the collection, produce the total number of plays for the entire collection.

**(b)** From a collection of albums, produce a list of strings, each string the title of an album.

**(c)** From a collection of albums, produce a list of the albums released before the year 2000.