

## SHP Spring 2019- April 6<sup>th</sup>

### Optional OOP Assignments

**1) You will make a `CDCollection` class and a `CD` class. And then create a `CDTester` to demonstrate the methods in your classes.**

#### <Requirements>

1. `CD` class has the following instance variables:

- title
- artist
- cost
- number of tracks on CD

2. `CD` class must have these methods: `init`, `str`, `cmp`

3. `CDCollection` has these instance variables:

- a list to store CDs
- count of CDs
- total cost

and these methods:

- `addCD(self, title, artist, cost, tracks):`  
add a CD with the specified attributes to the collection
- `sortCD(self):`  
sort CDs within the collection using the `cmp` function for CD  
\*\* use sorting algorithms!
- `removeCD(self, title):`  
remove the CD with the specified title
- `__str__(self):`  
print whatever looks nice to you as a representation of a CD Collection (could include titles in order, total # CDs, total cost, etc.)

4. You can write your `CDTester` however you want. You can hardcode the CDs you put in or take in input from the user.

Just demonstrate all your methods: show how your `CDCollection` prints, demonstrate the add and remove functions, etc.

## **2) OOP to model a linked list and insertion sort (You should work on this after we cover insertion sort next week)**

This is a quick guide to what a linked list is: <https://www.geeksforgeeks.org/linked-list-set-1-introduction/>

It also contains some example code for creating a linked list class in Python. Feel free to regard that as a starting point.

For this assignment, you should make the `Node` class and the `LinkedList` class (which should call on the `Node` class). Within the `LinkedList` class should be a user-defined function to implement insertion sort.

This is some starting code meant to help you get an idea of how to get started:

```
class Node(object):
    def __init__(self, x):
        self.val = x
        self.next = None # first initialize next node as None

    # add more functions as needed

class LinkedList(object):
    # constructor

    def insertionSortList(self, head):
        # implement insertion sort
```