Names: _____ **100 points total**

CS 2123 Programming Project 4 Fall 2019

Assignment is due at 11:59pm on October 31. Submit a digital copy of the assignment on Harvey. You may submit a lateness coupon request BEFORE the assignment is due by sending an email to cs2123f19@googlegroups.com with Subject "CS2123 Project Lateness Coupon". All other late work will receive a 10 percentage point deduction per day (including weekends), No late work is accepted beyond five days after the assignment is due.

Your task is to write code to solve the *count inversions problem*, as explained in Section 5.3 of *Algorithm Design*. The code should operate in $\Theta(n \log n)$ time and be implemented using a divide-conquer-glue strategy. Download starter code from `https://secon.utulsa.edu/cs2123/code/countinvert_starter.py`. Name the file `countinvert.py` and leave the function names unchanged.

In particular, your code should print out the inverted elements as they are encountered. The function should execute successfully the code inside the `if __name__ ==¨__main__¨` clause. Include output from running the code in `countinvert_output.txt`. The output should adhere to the following form:

```
$ python countinvert_sol.py
[7, 10, 18, 3, 14, 17, 23, 2, 11, 16]
3 conflicts with 18
14 conflicts with 18
3 conflicts with 7, 10
2 conflicts with 17, 23
11 conflicts with 17, 23
16 conflicts with 17, 23
2 conflicts with 3, 7, 10, 14, 18
11 conflicts with 14, 18
16 conflicts with 18
17 conflicts with 18
# Inversions: 19
...
[(3, 'The Lumineers: Ho Hey'), (4, 'Adele: Chasing Pavements'),
(2, 'Jimi Hendrix: Voodoo Chile'), (1, "Stevie Ray Vaughan: Couldn't Stand the Weather"),
(8, 'Coldplay: Clocks'), (6, 'Aretha Franklin: I Will Survive'),
(5, 'Cake: I Will Survive'), (7, 'Beyonce: All the Single Ladies'),
(9, 'Nickelback: Gotta be Somebody'), (10, 'Garth Brooks: Friends in Low Places')]
(1, "Stevie Ray Vaughan: Couldn't Stand the Weather") conflicts with
 (2, 'Jimi Hendrix: Voodoo Chile')
(1, "Stevie Ray Vaughan: Couldn't Stand the Weather") conflicts with
 (3, 'The Lumineers: Ho Hey'), (4, 'Adele: Chasing Pavements')
(2, 'Jimi Hendrix: Voodoo Chile') conflicts with
 (3, 'The Lumineers: Ho Hey'), (4, 'Adele: Chasing Pavements')
(5, 'Cake: I Will Survive') conflicts with
 (6, 'Aretha Franklin: I Will Survive')
(5, 'Cake: I Will Survive') conflicts with
 (8, 'Coldplay: Clocks')
(6, 'Aretha Franklin: I Will Survive') conflicts with
 (8, 'Coldplay: Clocks')
(7, 'Beyonce: All the Single Ladies') conflicts with
 (8, 'Coldplay: Clocks')
# Inversions: 9
```

Please note: you may not consult online resources displaying Python code implementing a solution to the count inversions problem. Doing so will be considered cheating, and dealt with accordingly.