CS2520 Lab 11 (10 points)

1. (5 pts) Write a general sort function that takes a comparison function as well as a list of values as parameters, then sort the list according to the comparison function provided. May use any sorting algorithm but do **NOT** use any predefined sorting function. Test the following:

   (1) Sort the integer list [5, 2, 12, 4, 9, 13, 22, 1, 6, 17] to descending order
   (2) Sort the name list [“Kate”, “Sam”, “Kate”, “Jolly”, “Alp”, “Beta”, “Alpine”, “Samuel”, “Bob”, “Joy”] according to alphabetical order.
   (3) Sort the tuple list of (name, count) according to name’s alphabetical order. If same name, then the one has higher count listed first. [(“Kate”, 3), (“Sam”, 2), (“Kate”, 5), (“Jolly”, 1), (“Alp”, 2), (“Beta”, 3), (“Alp”, 1), (“Alpine”, 2), (“Sam”, 4), (“Bob”, 2), (“Sam”, 3)].

2. (5 pts) Use list comprehension to create a list L with 100 elements from 1 to 100 in order, then use map and/or filter functions to perform the following – note: For each case, in main function, print L first, then for each function called, print out the result.
   (1) Return a list with each element is a doubled value of corresponding element of L. (must use lambda expression.)
   (2) Return a list with each element a squared value of each odd element in L. (your choice of using or not using a lambda expression.)
   (3) Return a list by taking all prime members from L. An isPrime() function is attached for your reference.

```
from math import sqrt
def isPrime (n) :
    if n <= 1 :
        return 0
    for fac in range (2, int(sqrt(n))+1) :
        if n % fac == 0 :
            return 0
    return 1
```

Submission: A pdf file with code and output as well as .py file (source code).

Grading criteria: correctness (6 points), use of (required features, e.g. a generic sort, lambda expression, map/filter, etc.)