Notice

- For each question, you submission should contain a .java source file and a screenshot of its execution. If you don't know how to take a screenshot, this website may help.
- If you use your free coupon by submitting a text file stating "I'm using my free coupon and I'll submit this assignment later" to learn@polyu before **November 5, 2015 11:59pm**, the deadline of this assignment will be extended to **November 12, 2015 11:59pm**.

1. (15 points) We've implemented the GenderSort in assignment#1 and the mid-term exam. However, the situation changed, and some students don't want to classified as boys or girls. Thus, a new number 2 is introduced for these students.

   The task is still to sort the students according to their gender, and all female students come first, followed by male students, and others come the last. Your algorithm must run in linear-time $O(n)$, and you are *not* allowed to use another array. The extra storage used by your algorithm, besides the given array, should be no more than constant size.

2. (15 points) Write the non-recursive version of merge sort. Your program should run in $O(n \log n)$ time and use $\frac{n}{2} + O(1)$ extra spaces.

   Hint: If you use Java, you may reuse the `main` method of `SortingTester.java` in the lab 2 for testing.

3. (20 points) Write the merge sort for linked list. You must use the class `LinkedList` I gave. If you're using other languages than Java, you need to implement it first.