## 实验 12

## 实验目的：

* 熟悉集合类

## 实验要求：

* 按照题目要求写代码，压缩，并上传到course.xmu.edu.cn

1. (Bubble Sort) Implement bubble sort—another simple yet inefficient sorting technique. It’s called bubble sort or sinking sort because smaller values gradually “bubble” their way to the top of the array (i.e., toward the first element) like air bubbles rising in water, while the larger values sink to the bottom (end) of the array. The technique uses nested loops to make several passes through the array. Each pass compares successive pairs of elements. If a pair is in increasing order (or the values are equal), the bubble sort leaves the values as they are. If a pair is in decreasing order, the bubble sort swaps their values in the array. The first pass compares the first two elements of the array and swaps their values if necessary. It then compares the second and third elements in the array. The end of this pass compares the last two elements in the array and swaps them if necessary. After one pass, the largest element will be in the last index. After two passes, the largest two elements will be in the last two indices. Explain why bubble sort is an O(n2) algorithm.
2. Use a HashMap to create a reusable class for choosing one of the 13 predefined colors in class Color. The names of the colors should be used as keys, and the predefined Color objects should be used as values. Place this class in a package that can be imported into any Java program. Use your new class in an application that allows the user to select a color and draw a shape in that color.
3. ***(Counting Duplicate Words)*** Write a program that determines and prints the number of duplicate words in a sentence. Treat uppercase and lowercase letters the same. Ignore punctuation.
4. ***(Sorting Words with a TreeSet)*** Write a program that uses a String method split to tokenize a line of text input by the user and places each token in a TreeSet. Print the elements of the TreeSet. [*Note:* This should cause the elements to be printed in ascending sorted order.]