# Lab Assignment 21 (Sets & Maps)

**NOTE: Your program should be your own work and not a copy of anyone else’s code. Copied code will not earn any points. (Keeping programs unique should not be too hard since you are naming the variables and functions yourself.)  
Don’t forget to add labels before everything you print.**

1. Write a program named **Lab21A** that will create a set of grocery items and use set operations to see if recipes can be made from those items.

* Create a TreeSet of Strings that will hold items you just bought from the grocery store
* Fill this set from the input file Lab21A1.txt
* Create a second TreeSet of Strings of ingredients for your first recipe and fill it from input file Lab21A2.txt
* Create a third TreeSet of Strings of ingredients for your second recipe and fill it from the input file Lab21A3.txt
* Call your method sending the grocery set and the first recipe set
* Call your method sending the grocery set and the second recipe set
* Print your remaining grocery set
* Write a void method that will accept the grocery TreeSet and a recipe TreeSet as parameters. It should do the following:
  + Using set operations, determine if the grocery item set contains everything in the recipe set (so you can make the recipe)
  + If it does:
    - Print a statement that says the dish was made
    - Print the ingredients in the recipe set
    - Remove all the items in this recipe set from the grocery set (because you used them to make dinner.)
  + If it does not contain the recipe set:
    - Print a statement saying that instead
    - Print the recipe ingredients that are missing from the grocery set

1. Write a program named **Lab21B** that will read words from an input file and create a map of the first letters in the words and how many words start with that letter.

* Create a LinkedHashMap with a Character key and Integer value
* Read words from the text file, Lab21B.txt
* Print the words as you read them; they should be all one line with a space between them
* For each word, get the first character
  + If the character is not a key in the map, add it as a key to the map with its corresponding value set to 1
  + If the character is a key in the map, add 1 to the value for that key
* After reading and processing all the words in the file, you should have a map containing all the letters that are first characters of those words with values that say how many times that character is found. Print the map.  
  (Ex – if you have the words (pop, push, set, map, stack, syntax) then your map would be  
   [p:2, s:3, m:1] )

1. Write a program named **Lab21C** that will create and work with a map structure
   * Create a TreeMap structure with a trivia team name (String) as the key and a contest score (Integer) as the value.
   * Fill the map by reading the values in from a text file (**Lab21C.txt**). The team’s name will be on one line and the score on a separate line . (Don’t change the contents or layout of the files.)
   * Print the map
   * Ask the user to enter a name and determine if that name is in the map. Print a statement to say if it is or not.
   * Ask the user for a score and count how many teams made that score or higher. Print the count with a label.