Problems relating to Unit 8 (Maps)

1. Copy the sample program SubjectCatalog.java, examine, compile and run it.
   1. What type of collection object is being used to hold the codes and names of the courses?
   2. What types are the keys?
   3. What do the keys represent?
   4. What types are the values?
   5. What do the values represent?
   6. What method is being used to add a key-value pair to the collection?
   7. What method is being used to check whether a particular key is within the collection?
2. Add code to SubjectCatalog to create a second Map to hold BS

courses, and add some course code - subject pairs to it. BS courses should start with BS, and might be things like Marketing and Accounting. Then create a third map called allCourses which will contain both the CS and the BS courses. Arrange to have the contents of this map sorted by course code. Check by using the containsAll() method that this new map has all the computing courses, then remove them from it: check that it still contains all the BS courses, and display them.

1. Copy, compile run and example the sample program ModuleMap.java.
   1. What type of collection is being used to hold the full catalog?
   2. What do the keys represent?
   3. What type of collection is being used to hold the keys?
   4. What method is being used to generate this collection?
   5. What method is used to get the lecturer names?
   6. What would happen if you used a list, rather than a set, to hold the lecturer names? (Try it and see)
   7. Change the code so that the lecturer names come up in alphabetical order
   8. When the iterator is obtained for the entry set, what type of object does its next() method return?
   9. How many methods are there in this interface?
   10. Use this iterator and one of the methods from Map.Entry to set all the lecturer names to “unknown”
   11. Does the statement map.put("Network Basics", "Genie"); add another entry for the subject “Network Basics”? If not, what does it do?
   12. Would the statement map.put("Survival Spanish", "Aine"); add another entry to the map? If not, what does it do?
   13. What is returned if you ask for a subject that is not in the map, as in map.get(“Hill Walking”);?
2. Write a program to declare, populate and display in an organised manner a collection of pairs consisting of a student’s name (the key) and that student’s favourite game (the value). If you enter a student’s name, your program should be able to retrieve that student’s favourite game directly.
3. Write a program to declare and populate a collection of Gift recipient – Gift record pairs, where the recipient is a String holding the person’s name, and the gift record is a full Gift object, with the item description and the price. Your program should then do the following: (a) display a list of all the gift items you need to get (including any duplicates) (b) display the details of the gift you are going to get for a particular person, if that person is in the map, or an appropriate message if not (c) add another pair to the map (d) display a list of all the people for whom you have allocated Gifts. You may need to add some methods to Gift.java to support this.
4. Investigate the methods in the two utility classes Arrays and Collections (note the ‘s’), then try out the sorting methods as follows: (a) Write a program like GenericFriendsList which sets up a list of Players in arbitrary order, then use Collections.sort() to sort it first by name, using the ComparePlayerNames comparator (display the list to make sure it worked), then by score using the ComparePlayerScore comparator (display again). (b) Write a similar program which sets up an array of Players, and sort the array using the Arrays.sort() method. Can you find a way to change the sorting order to descending?