Quiz 4-Generic Collections

Due Date: 24.05.2020/ 14.59

Goal: Learn how to use various Java Generic Collections APIs

Tasks: Read contact information from input file **contacts.txt** and store it to various data structures using java **Collection** classes, then store back to a file following the directions below. Element of each data structure must be stored as an object of class **Contact** that has the following four String type instance variables:

```java
public class Contact implements Comparable<Contact> {

    private String socialSecurityNumber;
    private String firstName;
    private String lastName;
    private String phoneNumber;
```

1-Store contacts to an *ArrayList*, then write the contacts to file *contactsArrayList.txt* iterating the *ArrayList*

2-Create class *LastNameComparator* that implements *Comparator* to sort contacts by last name. Use class *LastNameComparator* to sort ArrayList using *Collections.sort*. Then write the contacts to file *contactsArrayListOrderByLastName.txt.*

3-Store contacts to a *HashSet*, then write the contacts to file *contactsHashSet.txt* iterating the HashSet

4-Store contacts to a *TreeSet*, then write the contacts to file *contactsTreeSet.txt* iterating the *TreeSet*.

5-Use class LastNameComparator to store contacts in the order of last name with TreeSet. Then write the contacts to file contactsTreeSetOrderByLastName.txt.

6-Store contacts to a HashMap using a phone number as a key and a Contact object as a value. Then write the contacts to file contactsHashMap.txt iterating the HashMap.

- Your class must implement interface *Comparable* for class *Contact* to provide natural order for *TreeSet*. Please use phone number as a sort key for natural order.
- You are expected to produce the output for each store type as specified above, separately.
- You must submit your work with the file hierarchy as stated below:
  →<studentid.zip>
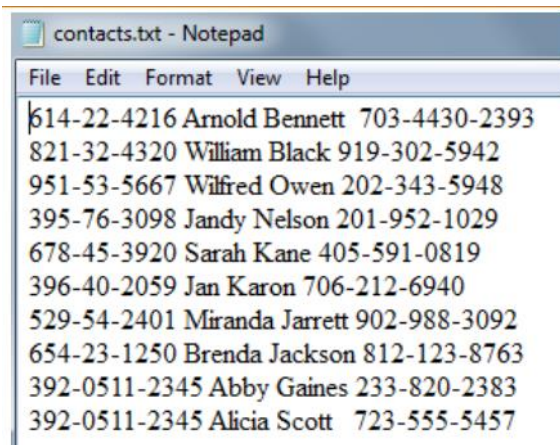   −Main. java , *.java

Execution and Test

The input file is going to be given as program argument. In order to test your program, you should follow the following steps:
- Upload your java files to your server account (dev.cs.hacettepe.edu.tr)
- Compile your code (javac Main.java or javac *.java)
- Run your program (java Main contacts.txt)
- Control your output data and format.
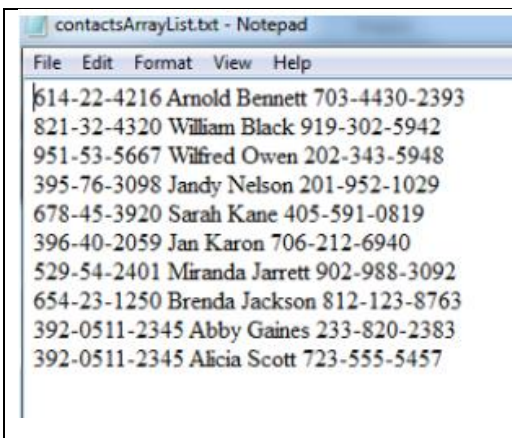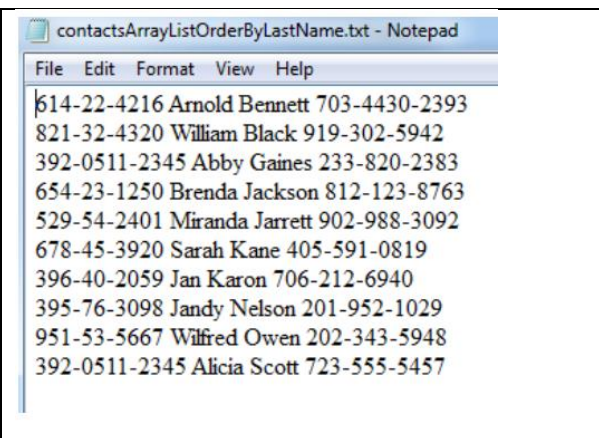
Input and output format

Phone number *[space]* name *[space]* surname *[space]* social security number *[newline]*
Phone number *[space]* name *[space]* surname *[space]* social security number *[newline]*
Phone number *[space]* name *[space]* surname *[space]* social security number *[newline]*
….

Example input file

contacts.txt - Notepad

File   Edit   Format   View   Help

```
614-22-4216 Arnold Bennett  703-4430-2393
821-32-4320 William Black 919-302-5942
951-53-5667 Wilfred Owen 202-343-5948
395-76-3098 Jandy Nelson 201-952-1029
678-45-3920 Sarah Kane 405-591-0819
396-40-2059 Jan Karon 706-212-6940
529-54-2401 Miranda Jarrett 902-988-3092
654-23-1250 Brenda Jackson 812-123-8763
392-0511-2345 Abby Gaines 233-820-2383
392-0511-2345 Alicia Scott   723-555-5457
```

Example Output file

contactsArrayList.txt - Notepad

File   Edit   Format   View   Help

```
614-22-4216 Arnold Bennett 703-4430-2393
821-32-4320 William Black 919-302-5942
951-53-5667 Wilfred Owen 202-343-5948
395-76-3098 Jandy Nelson 201-952-1029
678-45-3920 Sarah Kane 405-591-0819
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654-23-1250 Brenda Jackson 812-123-8763
392-0511-2345 Abby Gaines 233-820-2383
392-0511-2345 Alicia Scott 723-555-5457
```

contactsArrayListOrderByLastName.txt - Notepad

File   Edit   Format   View   Help

```
614-22-4216 Arnold Bennett 703-4430-2393
821-32-4320 William Black 919-302-5942
392-0511-2345 Abby Gaines 233-820-2383
654-23-1250 Brenda Jackson 812-123-8763
529-54-2401 Miranda Jarrett 902-988-3092
678-45-3920 Sarah Kane 405-591-0819
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395-76-3098 Jandy Nelson 201-952-1029
951-53-5667 Wilfred Owen 202-343-5948
392-0511-2345 Alicia Scott 723-555-5457
```

contactsHashMap.txt - Notepad

File Edit Format View Help

678-45-3920 Sarah Kane 405-591-0819
395-76-3098 Jandy Nelson 201-952-1029
392-0511-2345 Alicia Scott 723-555-5457
614-22-4216 Arnold Bennett 703-4430-2393
821-32-4320 William Black 919-302-5942
396-40-2059 Jan Karon 706-212-6940
529-54-2401 Miranda Jarrett 902-988-3092
951-53-5667 Wilfred Owen 202-343-5948
654-23-1250 Brenda Jackson 812-123-8763

contactsHashSet.txt - Notepad

File Edit Format View Help

678-45-3920 Sarah Kane 405-591-0819
395-76-3098 Jandy Nelson 201-952-1029
392-0511-2345 Abby Gaines 233-820-2383
614-22-4216 Arnold Bennett 703-4430-2393
821-32-4320 William Black 919-302-5942
396-40-2059 Jan Karon 706-212-6940
529-54-2401 Miranda Jarrett 902-988-3092
951-53-5667 Wilfred Owen 202-343-5948
654-23-1250 Brenda Jackson 812-123-8763

contactsTreeSet.txt - Notepad

File Edit Format View Help

392-0511-2345 Abby Gaines 233-820-2383
395-76-3098 Jandy Nelson 201-952-1029
396-40-2059 Jan Karon 706-212-6940
529-54-2401 Miranda Jarrett 902-988-3092
614-22-4216 Arnold Bennett 703-4430-2393
654-23-1250 Brenda Jackson 812-123-8763
678-45-3920 Sarah Kane 405-591-0819
821-32-4320 William Black 919-302-5942
951-53-5667 Wilfred Owen 202-343-5948

contactsTreeSetOrderByLastname.txt - Notepad

File Edit Format View Help

614-22-4216 Arnold Bennett 703-4430-2393
821-32-4320 William Black 919-302-5942
392-0511-2345 Abby Gaines 233-820-2383
654-23-1250 Brenda Jackson 812-123-8763
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