Collections

Lab 7

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Announcement

- You should finish the lab practice and submit your job to eTL before the next lab class starts(Wednesday, 7:00 PM).
- The answer of the practice will be uploaded after the due.

Overview

- Lecture Recap
  - Collections
    - Comparator
- Problem 1. Simple Diary Application(1): List

Recap: `Comparator`

- Method 1 (Natural Order): Override `compareTo(Object o)` of the elements' class.

- Method 2 (Special Order): Implement a `Comparator` interface.

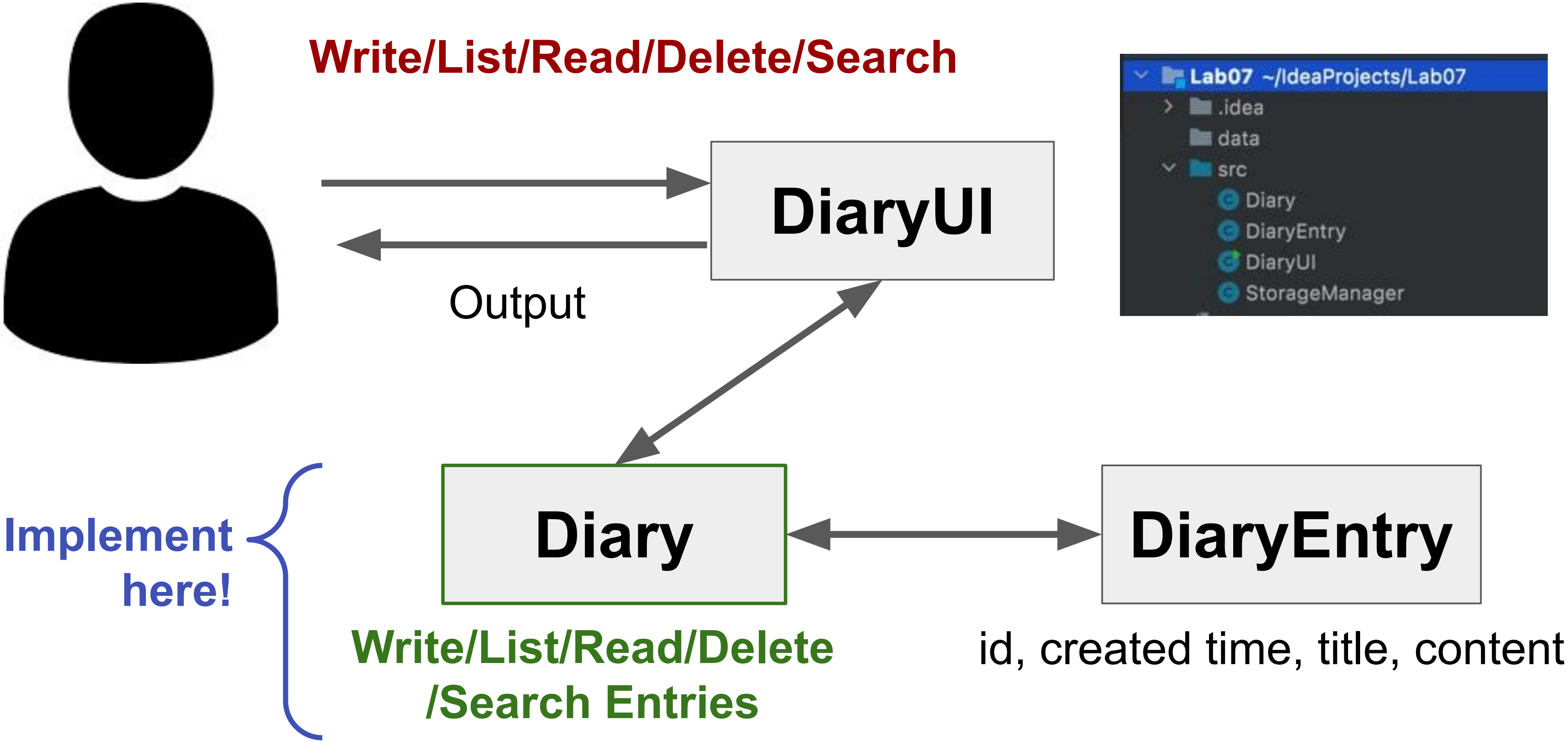
Recap: Comparator Example

```
public class ComparatorExample {
  public static void main(String[] args) {
TreeSet<Employee> sortbyName = new TreeSet<Employee>(new NameComp());
TreeSet<Employee> sortbyId = new TreeSet<Employee>(new IdComp());
      }
  }
```

```
  class NameComp implements Comparator<Employee>{
      public int compare(Employee e1, Employee e2)
       { return e1.getName().compareTo(e2.getName()); }
  }
  class IdComp implements Comparator<Employee>{
      public int compare(Employee e1, Employee e2)
       { return e1.getId().compareTo(e2.getId()); }
  }
```

```
class Employee {
    String name; public String getName() { return name; }
    int id; public Integer getId() { return id; }}
```

Problem 1 - Simple Diary Application (1)

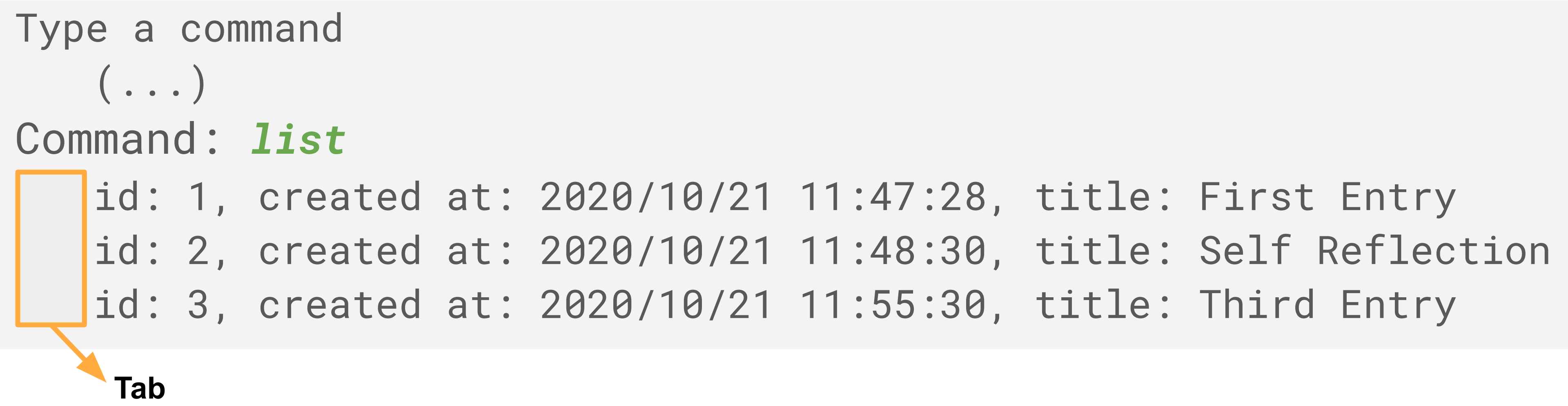


Write/List/Read/Delete/Search
DiaryUI
Output
Implement here!
Diary
DiaryEntry
Write/List/Read/Delete /Search Entries
id, created time, title, content

```
Lab07 ~/IdeaProjects/Lab07
  .idea
  data
  src
    Diary
    DiaryEntry
    DiaryUI
    StorageManager
```

Command 2 - Basic List Entries

- Print the list of the diary entries(id, created time, title) you created before.
- The listed entries should be sorted in **created time**, by **ascending** order. Print nothing if the list is empty.



```
Type a command
    (...)
Command: list
	id: 1, created at: 2020/10/21 11:47:28, title: First Entry
	id: 2, created at: 2020/10/21 11:48:30, title: Self Reflection
	id: 3, created at: 2020/10/21 11:55:30, title: Third Entry
```

Tab

Command 2 - List Entries (iterator)

```java
public void listEntries(){
    Iterator<DiaryEntry> iterator = diaryEntries.iterator();
    while(iterator.hasNext()){
        DiaryEntry curDiaryEntry = iterator.next();
        DiaryUI.print(entry.getShortString());
    }
}
```

Command 2 - List Entries

- List command that we implemented in the prior stage is the simplest one which prints the DiaryEntry in ascending order for the ID.

```
Type a command
    (...)
Command: list
    id: 1, created at: 2020/10/21 11:47:28, title: First Entry
    id: 2, created at: 2020/10/21 11:48:30, title: Self Reflection
    id: 3, created at: 2020/10/21 11:55:30, title: Third Entry
```

- Now, let’s implement additional List command which receives extra criteria for sorting as an argument.

Command 2 - List Entries (Single Condition)

- **list title**: print the list of the diary entries in **ascending** order for the **title**
- Print the list of the diary entries(id, created time, title) you created before.
- Use Comparator to compare and determine which entry’s title comes first.

Command 2 - List Entries (Single Condition)

```
Type a command
   (...)
Command: list
   id: 1, created at: 2020/10/21 11:47:28, title: First Entry
   id: 2, created at: 2020/10/21 11:48:30, title: Self Reflection
   id: 3, created at: 2020/10/21 11:55:30, title: Third Entry
```

```
Type a command
   (...)
Command: list title
   List of entries sorted by title.
   id: 1, created at: 2020/10/21 11:47:28, title: First Entry
   id: 2, created at: 2020/10/21 11:48:30, title: Self Reflection
   id: 3, created at: 2020/10/21 11:55:30, title: Third Entry
```

Command 2 - List Entries (Single Condition)

```
Type a command
   (...)
Command: list
   id: 1, created at: 2020/10/21 11:47:28, title: Zimbabwe
   id: 2, created at: 2020/10/21 11:48:30, title: Apple store
   id: 3, created at: 2020/10/21 11:55:30, title: Love CP Lab
```

```
Type a command
   (...)
Command: list title
   List of entries sorted by title.
   id: 2, created at: 2020/10/21 11:48:30, title: Apple store
   id: 3, created at: 2020/10/21 11:55:30, title: Love CP Lab
   id: 1, created at: 2020/10/21 11:47:28, title: Zimbabwe
```

Command 2 - List Entries (Single Condition)

```
public void listEntries(String condition1){
        Comparator<DiaryEntry> titleComparator = new Comparator<DiaryEntry>() {
            @Override
            public int compare(DiaryEntry entry1, DiaryEntry entry2) {
                return entry1.getTitle().compareTo(entry2.getTitle());
            }
        };

        Collections.sort(diaryEntries, new titleSort());
        DiaryUI.print("List entries sorted by " + condition1 + ".");
        ListIterator<DiaryEntry> iterator = diaryEntries.listIterator();
        while(iterator.hasNext())
            DiaryUI.print(iterator.next().getShortString());
    }
```

Command 2 - List Entries (Multiple Conditions)

- **list title length**: print the list of the diary entries in **ascending** order for the **title**, and if the title is the same, then print in **descending** order for the **content length**
- Print the list of the diary entries(id, created time, title, content length) you created before.
- Use Comparator to compare and determine which entry's title comes first.
- Determine the content length by the number of ***words*** in the content.
- Assume that there is no case where two entries have the same title and length.

Command 2 - List Entries (Multiple Conditions)

```
Type a command
    (...)
Command: list
    id: 1, created at: 2020/10/21 11:47:28, title: First Entry
    id: 2, created at: 2020/10/21 11:48:30, title: First Entry
    id: 3, created at: 2020/10/21 11:55:30, title: First Entry
```

```
Type a command
    (...)
Command: list title length
    List of entries sorted by title and length.
    id: 2, created at: 2020/10/21 11:48:30, title: First Entry, length: 30
    id: 1, created at: 2020/10/21 11:47:28, title: First Entry, length: 20
    id: 3, created at: 2020/10/21 11:55:30, title: First Entry, length: 10
```

Command 2 - List Entries

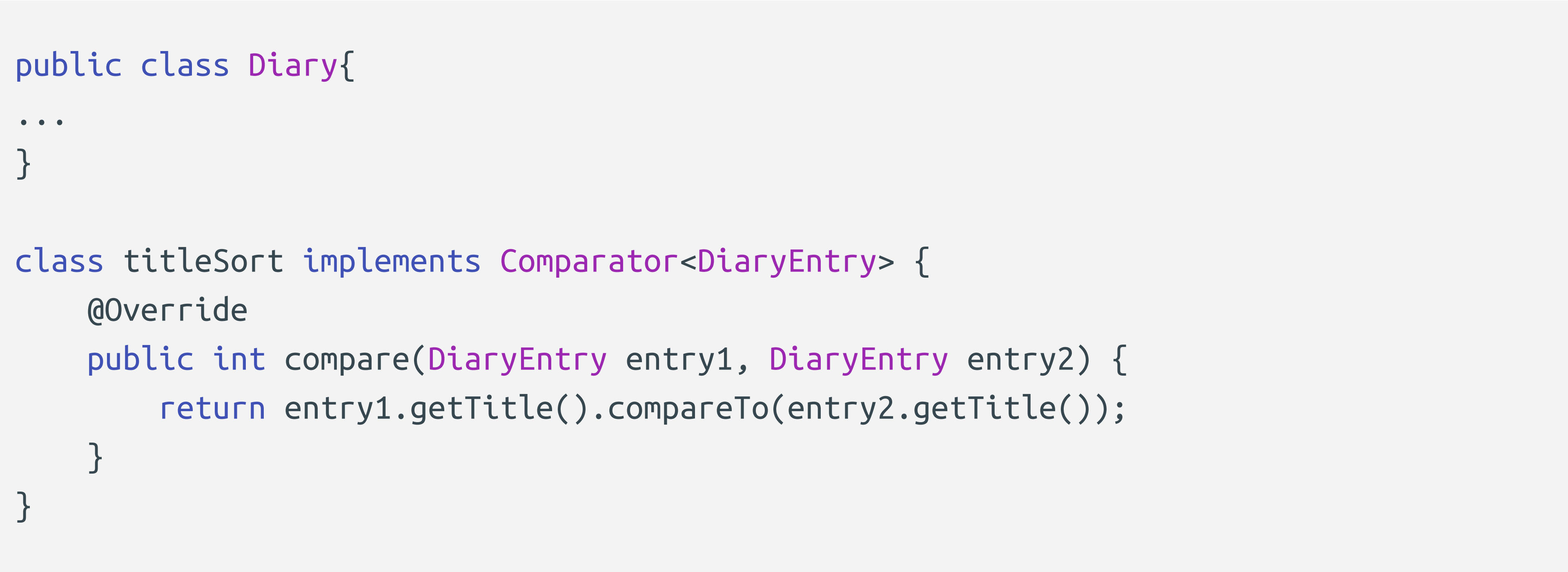
(Single Condition)

```java
public void listEntries(String condition1){
        Comparator<DiaryEntry> titleComparator = new Comparator<DiaryEntry>() {
            @Override
            public int compare(DiaryEntry entry1, DiaryEntry entry2) {
                return entry1.getTitle().compareTo(entry2.getTitle());
            }
        };

        Collections.sort(diaryEntries, new titleSort());
        DiaryUI.print("List entries sorted by " + condition1 + ".");
        ListIterator<DiaryEntry> iterator = diaryEntries.listIterator();
        while(iterator.hasNext())
            DiaryUI.print(iterator.next().getShortString());
    }
```

Duplicate Use

Command 2 - List Entries (Multiple Conditions)



```
public class Diary{
...
}

class titleSort implements Comparator<DiaryEntry> {
    @Override
    public int compare(DiaryEntry entry1, DiaryEntry entry2) {
        return entry1.getTitle().compareTo(entry2.getTitle());
    }
}
```

Command 2 - List Entries (Multiple Conditions)

```
class lengthSort implements Comparator<DiaryEntry> {
    @Override
    public int compare(DiaryEntry entry1, DiaryEntry entry2) {
        int length1 = entry1.getContent().split("\\s").length;
        int length2 = entry2.getContent().split("\\s").length;

        if (length1 == length2)
            return 0;

        return length1 < length2 ? 1:-1;
    }
}
```

Command 2 - List Entries (Multiple Conditions)

```java
public void listEntries(String condition1, String condition2){
        Collections.sort(diaryEntries, new lengthSort());
        Collections.sort(diaryEntries, new titleSort());

        DiaryUI.print("List entries sorted by " + condition1 + " and " + condition2 +
".");
        ListIterator<DiaryEntry> iterator = diaryEntries.listIterator();
        while(iterator.hasNext()) {
            DiaryEntry currentDiaryEntry = iterator.next();
            DiaryUI.print(currentDiaryEntry.getShortString()
                + ", length: " + currentDiaryEntry.getContent().split("\\s").length);
    }
}
```

Submission

- Compress your final `src` directory into a zip file.
  - After unzipping, the 'src' directory must appear.
- Rename your zip file as 20XX-XXXXX_{name}.zip - for example, 2021-12345_SeoHyuna.zip
- Upload it to eTL - **Lab 7** assignment.

Thank You!!!

Q&A Time!