

Java File IO

Lab #4

COMP3021 2022 Spring

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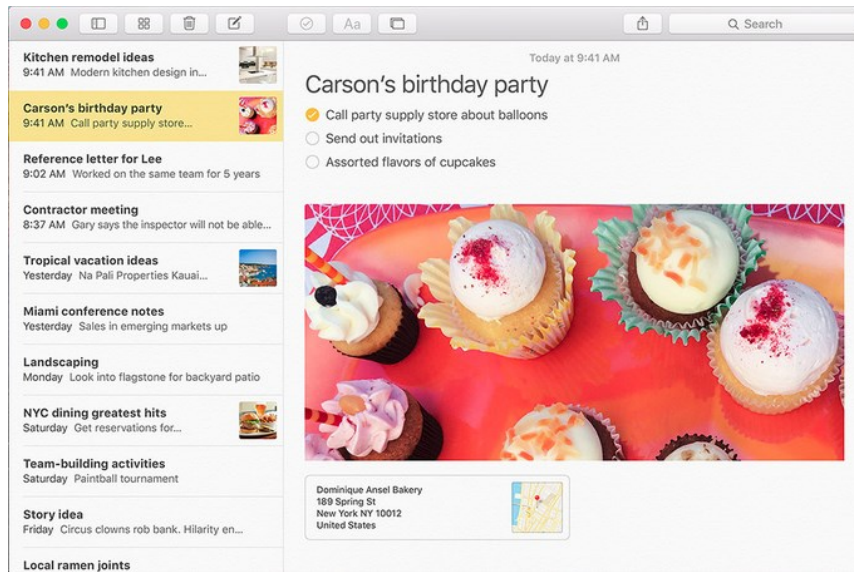
- **Objectives of this lab**

Learn How to Serialize Objects

Learn How to Save on File an Object Serialization

Learn How to Load from File an Object Serialization

Learn How to Read and Write a text file

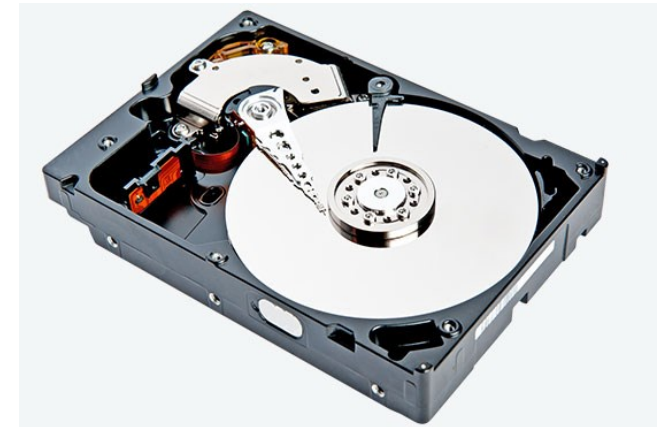


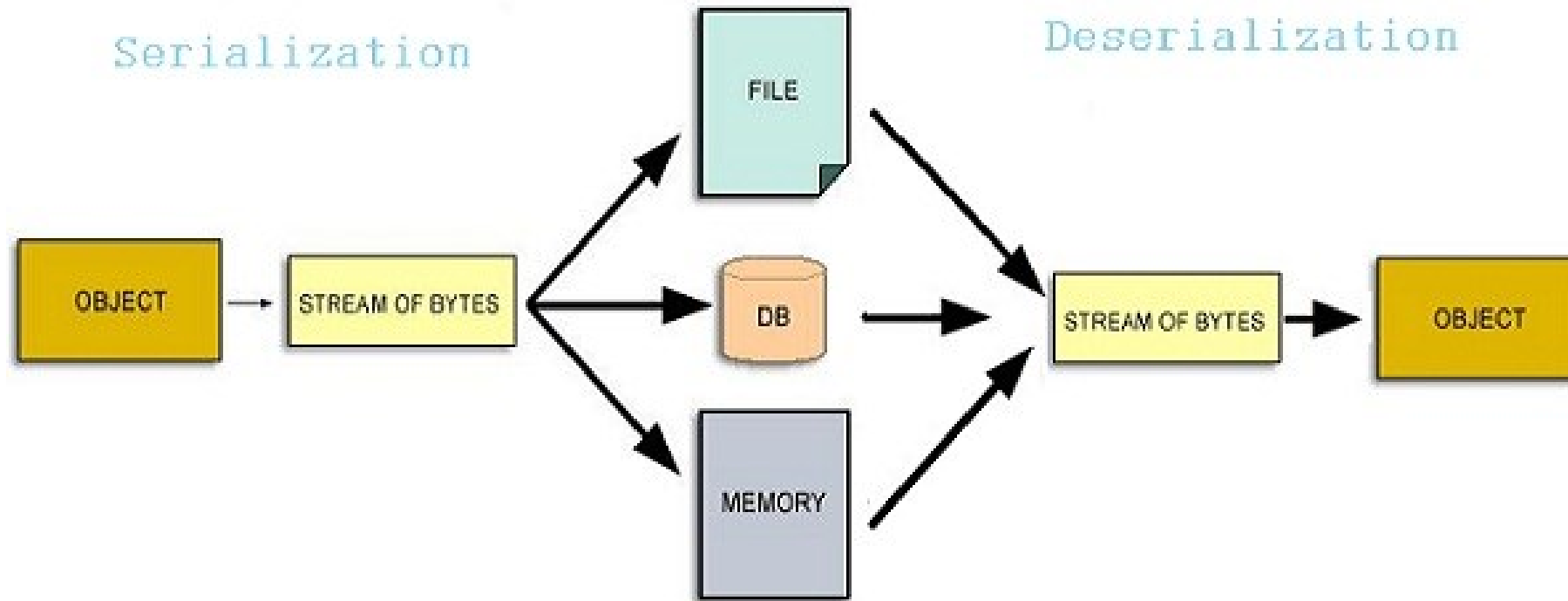
save



load

All notes will be lost if we do not save them on disk!





A class can be serialized successfully only if

- The class implement the `java.io.Serializable` interface
- All of the fields in the class are serializable!

- Example of object serialization

```
public class Person implements java.io.Serializable {  
    private String firstName;  
    private String lastName;  
    private static final long serialVersionUID = 1L;  
    public Person(String firstName, String lastName) {  
        this.firstName = firstName;  
        this.lastName = lastName;  
    }  
}
```

- Save on disk

```
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.ObjectInputStream;
import java.io.ObjectOutputStream;

....
Person object = new Person("Valerio", "Terragni");
// how to save object to file ?
FileOutputStream fos = null;
ObjectOutputStream out = null;
try {
    fos = new FileOutputStream("file.ser");
    out = new ObjectOutputStream(fos);
    out.writeObject(object);
    out.close();
} catch (Exception e) {
    e.printStackTrace();
}
```

- Load from disk

```
// How to load object in memory from file
FileInputStream fis = null;
ObjectInputStream in = null;
try {
    fis = new FileInputStream("file.ser");
    in = new ObjectInputStream(fis);
    Person object= (Person) in.readObject();
    in.close();
} catch (Exception e) {
    e.printStackTrace();
}
```

Path of the file!

- **LAB #5 Overview**

Task 1: Save the object Notebook to file

Task 2: Load an object Notebook from file

Task 3: Import a TextNote from file

Task 4: Export a TextNote to file

Task 1: Save the object Notebook to file

1. Make the class Notebook implements java.io.Serializable
 - Remember that all its fields (and the fields of the fields) have to implement java.io.Serializable interface!
 - Java supports multiple interface “implements”. All interfaces of a class have to be separated by a comma
 - For example:

```
public class imp [redacted] ts Comparable< >,Serializable{ [redacted]
```

- Most native Java classes already implements Serializable interface (for example String and ArrayList)


```
private static final long serialVersionUID = 1L;
```

Task 1: Save the object Notebook to file

- Implement the following public method in the class Notebook
 - HINT: Use the Java keyword that refers to the current Object instance when serializaing the object

```
/**
 * method to save the Notebook instance to file
 *
 * @param file, the path of the file where to save the object serialization
 * @return true if save on file is successful, false otherwise
 */
public boolean save(String file){
    \\TODO
    try {

        \\TODO

    } catch (Exception e) {
        return 
    }
    return true;
}
```

Task 2: Load an object Notebook from file

- Implement the following constructor in the class Notebook

```
/**
 *
 * Constructor of an object Notebook from an object serialization on disk
 *
 * @param file, the path of the file for loading the object serialization
 */
public Notebook(String file){

    // TODO
    Notebook n = (Notebook) in.readObject();
    // TODO

}
```

Task 3: Import a TextNote from file

- Implement the following two methods in the class TextNote

```
/**
 * load a TextNote from File f
 *
 * the tile of the TextNote is the name of the file
 * the content of the TextNote is the content of the file
 *
 * @param File f
 */
public TextNote(File f) {
    super(f.getName());
    this.content = getTextFromFile(f.getAbsolutePath());
}

/**
 * get the content of a file
 *
 * @param absolutePath of the file
 * @return the content of the file
 */
private String getTextFromFile(String absolutePath) {
    String result = "";
    // TODO
    return result;
}
```

```
import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.IOException;
import java.io.InputStreamReader;
```

Task 4: Export a TextNote to file

```
import java.io.BufferedWriter;
import java.io.FileWriter;


/**
 * export text note to file
 *
 *
 * @param pathFolder path of the folder where to export the note
 * the file has to be named as the title of the note with extension ".txt"
 *
 * if the tile contains white spaces " " they has to be replaced with underscores "_"
 *
 */
public void exportTextToFile(String pathFolder) {
    //TODO
    File file = new File( pathFolder + File.separator + ".txt");
    // TODO
}
```



- **Test your code**

1. Download the **testLab4.java** class from the course website
<https://course.cse.ust.hk/comp3021/labs/lab4/testLab4.java>
2. Copy and paste the java source file in the default package
3. Run the main function of this class and show your results to TAs.

Sample Output:



```
<terminated> testLab5 [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_101.jdk/Contents/Home/bin/.
saved notebook to file test.ser
your notebook has been loaded
TextNote exported in /Users/valerio/git/comp3021lab/COMP30213021_syllabus.txt
Congratulations, your code is OK
```

END OF LAB #4

Don't forget to commit and push your code.

