9. Sort, Interface, Threads
Drawing Examples
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File read/write

• How to read and write file
• Useful to save data
• Useful to use pre-defined parameter

• PrintWriter
  – When we write file
• BufferedReader
  – When we read file
package fileinout;
import java.io.FileWriter;

public class PrintWriterDemo {
    public static void main(String[] args) throws Exception {
        String filename = "fileName.txt";
        String[] linesToWrite = new String[] { "abc", "bddd" };
        boolean appendToFile = true;

        PrintWriter pw = null;
        if (appendToFile) {
            pw = new PrintWriter(new FileWriter(filename, true));
        } else {
            pw = new PrintWriter(new FileWriter(filename));
        }
        for (int i = 0; i < linesToWrite.length; i++) {
            //Use like System.out.println
            pw.println(linesToWrite[i]);
        }
        pw.flush();
        pw.close();
    }
}
package file inout;

import java.io.BufferedReader;
import java.io.FileReader;

public class BufferedReaderDemo {
    public static void main(String[] args) throws Exception {
        String thisLine = null;
        try{
            // open input stream test.txt for reading purpose.
            FileReader fr = new FileReader("fileName.txt");
            BufferedReader br = new BufferedReader(fr);
            while ((thisLine = br.readLine()) != null) {
                System.out.println(thisLine);
            }
            br.close();
        }catch(Exception e){
            e.printStackTrace();
        }
    }
}
Where is the written file?

If you can’t see, do Refresh (F5) list
Practice : Object Read and Write

• Read Student.java
  – Set/get functions
  – toString
• Read ScoreGeneratorDemo.java and run it
• Check generated file

• Complete
  – Score Reader Demo
  – Read from txt file and then save them to Vector as Student Object
Sorting

• Bubble sort, merge sort, quick sort...
  – You can learn them in college if you choose CS

• We just need to how to use it.

• Use Collections.sort function
  – Use Comparator object
Practice

• **Read**
  – Sorting code
  – CompareTo function in Student.java
    • Negative values : false
    • Positive values : true
  – Comparator
  – What is current sorting criteria?

• **Convert**
  – Sort based on mean score.
Draw Examples

• Open codes in drawExample
  – Run BouncingBall.java
Bouncing Ball Activity Diagram

start

Initialization

Update Velocity

Update ball Position

Clear

Draw BG

Draw Ball

Pause

Loop ends?

end

no

yes
Activity Diagram

{Client is registered with the brokerage system}

Client enters login name and password

Correct Login and password?

[Yes]  
Client has successfully logged in

Client's settings are displayed

[No]  
Invalid login/password

{Client logs into the system.}
Graphical User Interface (GUI) design
Interface

• **Unique** feature of Java
• Interface is a kind of Incomplete class
  – *Only has header* of methods
• To allow multi inheritance (kind of)
  – Java doesn’t allow multi-inheritance
• Use keyword *implements* like extends
  – To enforce implementation for users when they use a interface
• When?
  – Cooperate
  – Keyboard, action listener
Let's look at zookeeper examples
Thread

- Use multi flow of program
- To utilize 100% of multi-core cpu
- To make interactive program (important)
- Let's see some examples
  - Simple thread
  - Thread with detail (number)
  - Thread join
  - Thread by using runnable interface
Drawing Example

• Edit Bouncing ball
  – Change image instead of black dot
  – Apply keyboard input
  – Move object from keyboard input
Homework

• 2 weeks later (September 20\textsuperscript{th})
  – Use MS powerpoint
  – Bring your idea to program
    • Name and what it is
  – Draw GUI
    • and Activity Diagram – optional
    • As detail as possible
  – At least 2 slides.
  – More detail!
Questions
References

• IBM