Fast Track to Java 8 and OO Development
Rev. 20160729 - Instructor Notes

Course Overview

This is a 5-day course that provides a broad and deep introduction to Java for non-Java programmers. The course covers all the basic concepts of Object-Oriented Programming and Java. We've included material and labs on all the key OO concepts, including topics like encapsulation, composition, and inheritance. It also includes some coverage of advanced Java capabilities such as JDBC/JPA and the Collections Framework, as well as coverage and usage of many of the newer capabilities in Java 8. There are a large number of labs, and all labs except the first are done with a development environment (e.g. Eclipse or RAD). The lab instructions include detailed directions on the particular environment for that version of the course.

The course is fairly full, and can be used for a fairly wide range of audiences, with the presentation varied to fit the needs of a particular teach. These audiences may range from programmers with some exposure to Java or related languages (e.g. C or C++) to programmers with entirely unrelated backgrounds (e.g. mainframe programmers). For most audiences, you can cover all the material in the course, but will need to vary the labs based on the experience level. For audiences with less relevant experience, you will want to skip some of the optional or more advanced labs.

Many of the labs build on previous labs, and sometimes less experienced students have problems keeping up. If students are falling behind in the labs, you have two options. Which one of these options you pursue really depends on the student and the situation.

- Letting them just continue where they are at each lab break, and doing everything themselves
- Letting them catch up by grabbing one of the lab solutions from the solutions zip

Changes from the previous release include:

- Adds Java 8 capabilities, including static/default methods in interfaces, and a brief introduction to lambda expressions (which are really a topic for a more advanced course)
- Adds an enum section, and a short (discussion-only) lab on using enums

Course Schedule:

The approximate pacing of the course is as follows (Note that the last day has fewer labs, and can be used for catchup) :

Day 1: Session 1, Session 2, and Session 3. You may not finish the lab at the end of Session 3, but anywhere in this area is fine.

Day 2: Session 4, Session 5. This is a fairly hefty chunk of material, and covers many of the basic concepts of creating classes and objects in Java. For people relatively new to the concepts it takes some time to absorb. Lab 04.5 is on using the debugger, and if students are not very comfortable with using the IDE, the instructor may want to do it together with the students - leading them through the lab steps.

Day 3: Session 6, Session 7, start Session 8. You should start the day with a good review of all the OO concepts and Java that they've learned until now. This will help them absorb all the new ideas. This is another fairly hefty chunk of material, especially Section 8 (Composition and Inheritance). Lab 8.1 on Composition is labeled as optional because for some audiences with very little relevant experience, it just gets to be too much. However, it is a valuable lab, and it's very worthwhile to do. If things are moving slowly, you can do Lab 8.1 as a group with the instructor leading, rather than skipping it entirely.

Day 4: Finish Session 8, Session 9, Session 10 and Start Session 11. Again, a good review in the morning of all the new concepts from the day before is helpful. Session 9 (Interfaces) can be hard to grasp because of the abstractness. Exceptions and JDBC can be a little easier going, especially for groups that have database experience.

Day 5: Finish Session 11, Session 12, Session 13 and Session 14. You're in the final stretch. The last three sections are less intense than the rest of the course, and leave you plenty of room to catch up if the pace has been slower earlier in the course. The labs are fairly straightforward, and Session 14 (I/O) is optional and can be skipped without losing much. There may also be time to review concepts that were difficult from earlier sessions (e.g. Interfaces) at the end of the day.

All the labs have times associated with them in the manual. A range is given to take into account the different skill levels of different students. Most students should finish within those times, but use them as a guideline of the relative lengths of the labs, and don't take them as absolutes. Often there is also additional time taken up with students taking breaks during labs, and that increases the time for each lab.

The table below gives some useful information on the size of each session and the number of labs

Session	**Number of Pages**	Lab / Lab Time
Session 1 - Simple Java Class	8	Lab 1.1 - 20-30 min.
Session 2 - Java Overview	18	Lab 2.1 - 30-40 min.
Session 3 - Class and Object Basics	38	Lab 3.1: 15-20 min. Lab 3.2: 10 min. Lab 3.3 25-35 min.
Session 4 - More on Classes and Objects	58	Lab 4.1: 20-30 min. Lab 4.2: 20-30 min. [Optional] Lab 4.3: 20-30 min. Lab 4.4: 20-30 min. Lab 4.5: 20-30 min.
Session 5 - Flow of Control	16	Lab 5.1: 20-30 min.
Session 6 - Strings and Arrays	20	Lab 6.1: 30-40 min.
Session 7 - Packages	30	Lab 7.1: 25-35 min.
Session 8 - Composition and Inheritance	43	[Optional] Lab 8.1: 30-40 min. Lab 8.2: 20-30 min. Lab 8.3: 20-30 min.
Session 9 - Interfaces	20	Lab 9.1: 25-35 min.
Session 10 - Exceptions	24	Lab 10.1: 30-40 min.
Session 11 – Collections and Generics	50	Lab 11.1: 25-35 min.

		Lab 11.2: 15-20 min.
Session 12 - Database Access with JDBC and JPA	38	Lab 12.1: 30-40 min. Lab 12.2: 30-40 min. Lab 12.3: 10 min.
Session 13 - New Language Features	30	None
Session 14 - I/O Streams (Optional)	34	[Optional] Lab 14.1: 20-30 min

Lab Description

Most of the labs are fairly straightforward, focusing on defining a class Television and a program that uses it. The complexities of the Television class (and associated classes) are slowly increased to incorporate each new concept learned. The lab descriptions in the manual are fairly detailed, so there shouldn't be any problem understanding them. Lab 1 has the students compile and run a Java program from the command line - since it's useful for them to know that you can use Java without an IDE. There is a small script to set up the environment in the lab directory. All the other labs are done using an IDE (e.g. Eclipse or IBM RAD), and there are detailed instructions for working with the IDE in the manual tailored for the specific IDE in that version. There are a few labs where students make a new project, and it's useful if instructors remind them how to do that when those labs are done.

Feedback

We really do revise our courses and continually strive to improve them. If you have any feedback or corrections, please send them to our Director of Services Yaakov Weintraub at yaakovw@LearningPatterns.com. For specific issues or corrections, a list with page numbers is the most useful to us, but any feedback is useful