

# Programming in Java - level II



## Purpose of the training

Training aimed at people who want to learn how to design and build desktop applications using Java.



## Benefits of completing the training

During the training, participants learn about the selected Java language options in the field of efficient data processing (work with collections, data streams, the use of regular expressions, concurrent processing) and their persistence in files and relational databases. They will also acquire the ability to build a graphical user interface. The presented material largely covers the scope of knowledge required for the OCPJP exam (Programmer II).



## Expected Listener Preparation

Knowledge of the Windows environment. Having experience in programming Java in the scope discussed at JPR01 training.

As a supplement, we recommend:

- OCPJP - Preparation for the OCPJP certificate



## Training Language

- Training: English



## Duration

5 days / 35 hours

## Training agenda

1. Class construction
  - Class components
  - Internal classes
  - Local classes
  - Anonymous classes
  - Static classes
2. Input-output operations
  - Streams
  - File operations
  - Closing streams
  - Decorators
  - NIO and NIO.2 library
  - Directories and directory trees
  - Operations on files and file system
  - Monitoring changes
3. Selected design patterns
  - Singleton
  - Builder
4. Operations on collections
  - Use of generic types
  - Sorting collections and other algorithms
  - Collections and multithreading
5. Lambda expressions
  - An example problem and a trivial solution
  - Use of the delegation
  - Anonymous classes
  - Lambda expressions
  - Lambda project
  - Functional interface
  - The type of lambda expressions

- References
  - Effective final variables
6. Built-in functional interfaces
    - Generic functional interfaces
    - Primitive functional interfaces
    - Binary functional interfaces
    - Operators
  7. Data streams (Stream API)
    - Definition of data stream
    - Stream features
    - Creating streams
    - Optional values
    - Intermediate operations
    - Terminal operations
    - Sorting data in the stream
    - Serial and parallel streams
  8. Formatting and internationalization
    - The need for multi-linguicism
    - Locators
    - ResourceBundle class
    - Formatting
  9. Multithreaded programming part 1
    - Creating multithreaded applications
    - Creating and starting threads
    - Thread control methods
    - Ending a thread work
    - Thread states
    - Data protection
    - Cooperation of threads
  10. Multithreaded programming part 2
    - Receiving the results of asynchronous calculations
    - Task planning
    - Atomic types
    - Cyclic barrier
    - The Fork / Join Framework
  11. Creating a graphical interface
    - Graphic library assumptions
    - Basic concepts when creating a GUI
    - Managing the distribution of components
    - Swing app

- Delegative event model
- Graphic applications, and multi-threading
- Building a menu

## 12. Programming of databases

- DAO pattern
- Introduction to JDBC
- Establishing a connection
- Processing of query results
- Introduction to JPA