SoTeSoLa
Software Technologies
and Software Languages
SoTeSoLa: Software Technologies

- Modeling: UML, EMF, QVT, AM3, ...
- Mapping: ODB, Hibernate, JAXB, JiBX, XStream, JSON, YAML, ...
- Graphics: Tk, GTK+, SWT, AWT, Swing, ...
- Build automation: Ant, make, rake, ...
- Web programming: GWT, ASP, JBoss, ...
- ...
- ...
SoTeSoLa: Software Languages

- Java, C#, Scala, Groovy
- Haskell, Hugs, Ωmega, Helium, Gofer
- COBOL and its 700 dialects
- Python, Ruby, Perl, awk, sed
- JavaScript, CoffeeScript, Dart, Mobl, Kaffeine
- LISP, CLOS, Scheme, Clojure
- ML, F#, OCaml
Software Chrestomathies

- Rosetta Code
  - 450 programming tasks
  - 351 programming languages
- 101 companies
  - 1 problem domain
  - 131 implementations
  - 43 software languages
  - 82 software technologies
Hackathon objective

• Exercise methods and tools for
  • reverse engineering
  • reengineering

• Apply them to
  • 101 companies repo

• Expectation:
  • produce a corpus of samples for teaching
Hackathon rules

• Register at http://planet-sl.org/sotesola2012-hackathon

• Hangouts + Skype sessions + on-site sessions

• Propose your problem

• Develop your solution

• Commit the code to GitHub (unless another infrastructure is crucial)

• Win the prize

• Utilise the prize
Hackathon details

- Form a team of 3 (three) participants
- Bring your favourite methods & tools
- Work on 101companies chrestomathy
- Think of a problem
- Choose the appropriate subset of implementations
- Hack!
Reverse Engineering

Fact extraction

- Lines of source code & other size metrics
- Cyclomatic complexity
- Software science
- Maintainability index
- Dead code detection
- ...

...
Software visualisation

- Control flow graph
- Data flow graph
- Metrics visualisation
- Relation visualisation
- ...
Vocabulary mining

- Naming analysis
- Verb & noun analysis
- Word clouds
- Ontology verification
- ...

...
Analysis of technology usage

- How extensively the language is used?
- What features of a technology are the most used ones?
- Which functionality is never used?
- What is the API usage coverage?
- ...

Architecture recovery

- Model-driven context of reverse engineering
- Model extraction
- Data model inference
- Grammar inference & recovery
- Design pattern recovery
- ...

...
Reengineering

http://commons.wikimedia.org/wiki/File:Grus_grus_-migrating_north-6a.jpg
Program refactoring

- Apply known refactorings to existing solutions
- Make it so that it doesn’t break
- Dead code elimination
- API migration
- ...
Migration

- API migration
- Language migration
- Framework migration
- Platform migration
- Wrapping
- ...

Code injection

• Assertions
• Logging
• Aspect weaving
• Feature composition
• ...

Architectural modifications

- API improvement based on its current usage
- Database re-engineering
- Modularization or component identification
- Coupled software transformations
- Legacy system renovation
- …
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This page describes the hackathon, but the discussions and activities take place within the group "SoTeSoLa Hackathon" on planet-sl.org/community

- **Software Mining** [Wikipedia]
- **Reverse engineering** [Wikipedia]
- **Re-engineering** [Wikipedia]
- **Simple illustrative implementations** [github.com/SoTeSoLa]

More illustrative implementations elsewhere:
- loc101demo
- api101demo
- coupling101demo

- 101companies:
  - 101repo
  - 101wiki
  - 101data
  - meta-level 101features

- Conferences @ DBLP:
  - Reverse engineering: WCRE, ICPC, MSR, ...
  - Re-engineering: ICSM, CSMR, ...

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Let’s hack!

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