

OOP Projects

Introduction

The following topics are available for the students of Object Oriented Programming course during Fall 2006. The students should form groups of 1..4 people. Group size of 2-3 persons is preferred.

In the following topic descriptions you are usually just instructed to develop an application of some kind. Depending on the topic it might be more beneficial to develop an applet or Java Web Start application instead.

Some of the topics might seem like they take about 1 hour to code and they probably will if done simply. Therefore you have to discuss it with the instructors so we can add or release requirements to match the expected amount of work to the number of people in the group.

Some topics are expected to require one or more of the following: previous knowledge of Java, special dedication and long-term availability, special skills (e.g. OpenGL/DirectX programming), ability to interact with other people in the Department, good API reading skills, and an open mind. On the other hand, they might be more rewarding in the long run, by e.g. yielding more credits or a good basis for future projects.

Games

1. *Sudoku*

Reference: <http://www.websudoku.com/>

Goal: You are expected to develop an application for playing the game of sudoku. The program should support both creating new puzzles (manually) and for solving existing puzzles. Optionally you can use your mathematical skills and implement some automatic puzzle creation support.

2. *Pentamino*

Reference: <http://www.theory.csc.uvic.ca/~cos/inf/misc/PentInfo.html>

Goal: You are expected to develop an application that allows the user graphically solve the problem of fitting the 12 pentomino pieces into various shapes.

3. *Rubik's Cube*

Reference: http://en.wikipedia.org/wiki/Rubik's_cube

Goal: You are expected to implement an application that will allow you to solve the Rubik's Cube graphically.

4. *Game of Fifteen*

Reference: <http://www.gomath.com/htdocs/game/fifteen/index.html>

Goal: You are expected to implement an application that will allow the user to solve the 15-puzzle graphically. Other puzzle sizes can also be considered.

5. Pool

Reference: <http://en.wikipedia.org/wiki/Billiards>

Goal: You are expected to implement a simulator for the well-known game of Pool.

6. Mahjong Solitaire

Reference: http://en.wikipedia.org/wiki/Mahjong_solitaire

Goal: You are expected to develop an application for playing the game Mahjong solitaire.

Applied areas: GIS, image processing, etc.

7. Topological model of vector maps

Reference: .A. Kolesnikov

Goal: You are expected to implement an application that will allow to download and visualize vector map with topological model, including support of simple edit operations.

8. Simplification of vector data

Reference: A. Kolesnikov

Goal: You are expected to implement an application that will allow to download, simplify and visualize polygonal curves.

9. Directed acyclic graph, Trellis graph: shortest path, etc.

Reference: .A. Kolesnikov

Goal: You are expected to implement application which that will allow to download description of weighted graph and find the shortest path in the graph.

10. String Edit/DTW

Reference: .A. Kolesnikov

Goal: You are expected to o implement application which that will allow to download text strings (or any relevant data) and find minimal distance among the strings.

Databases

11. Database for movies, audio files, etc.

Reference: ...

Goal: You are expected to an application that utilizes a database to store and retrieve information of your choice.

Multimedia

12. *Audio player*

Reference: http://java.sun.com/j2se/1.4.2/docs/guide/sound/programmer_guide/contents.html

Goal: You are expected to develop a simple audio file player.

Networking

13. *Raster image maps from map server (Tiger, NLS)*

Reference: A. Kolesnikov...

Goal: You are expected to an application which that will allow to download and visualize raster map image form map server for given geocoordinates.

14. *Two person chat/file transfer program*

Reference:

Goal: You are expected to develop a simple application that will allow direct connection between two persons on the Internet. The people should be able to chat (text based) and optionally also transfer files between each other.

15. *Chat server and client*

Reference: -

Goal: You are expected to develop a simple chat server as a servlet. The servlet should be able to store the messages for a short while so that other clients connecting within the time frame can retrieve the messages sent by other users. You should also develop a simple client that utilizes the chat server.

Computer Graphics

16. *Turtle graphics (LOGO)*

Reference: <http://el.media.mit.edu/logo-foundation/logo/turtle.html>

Goal: You are expected to develop an application that will allow the turtle to show its artistic talents. The turtle should understand commands given using the (perhaps simplified) LOGO language.

Misc

17. *Archive manager*

Reference: <http://java.sun.com/j2se/1.5.0/docs/api/java/util/zip/package-summary.html>

Goal: You are expected to develop a simple application for either compressing and uncompressing single gzip-compressed files or creating and extracting zip archives. In this project special care should

be paid to making the application as intuitive as possible to use, possibly at the expense of versatility.

18. *Regular expression assistant*

Reference: <http://java.sun.com/docs/books/tutorial/essential/regex/>

Reference: <http://www.regular-expressions.info/regextbuddy.html>

Goal: You are expected to develop an application that will both assist the user in creating Java style regular expressions and also explain the structure of existing regular expressions.

19. *Google Web Toolkit*

Reference: <http://code.google.com/webtoolkit/>

Goal: You are expected to develop a useful AJAX web application using the Java language and Google Web Toolkit. The application should make good use of the features the toolkit offers.

20. *Roman calculator*

Reference: <http://www.gwydir.demon.co.uk/jo/roman/number.htm>

Goal: You are expected to develop a simple 4-operation (+, -, *, /) calculator, that uses for its input and output Roman numerals. The possible floating point results should be displayed and maintained as fractions instead of discarding the decimal portion.

21. *JOGL*

Reference: <https://jogl.dev.java.net/>

Goal: You are expected to develop an application that uses the JOGL library to show 3D graphics. For example a simplified planetary animation.

22. *Java learning environment and tools*

Reference: Teemu Laine

Goal: You are expected to develop a simple framework that will allow building simple game-like exercises for learning Java on one's own. You should also design and implement some exercises that utilize this framework. Possible exercise types include e.g.:

- source code scrambler: the user is given the source lines of a simple program and (s)he has to drag the lines to the correct order to form a working program and finish the exercise
- error spotter: the user has to find and correct the errors in sample source code

23. *Mobile blogging tool*

Reference: Teemu Laine

Goal: You are expected to develop a mobile application that will allow the user to send text and pictures from the mobile phone directly to a predefined email account using SMTP connection.

24. *Own topic*

You can also select some other topic but you have to discuss with the instructors to make sure it's suitable for a project.

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