Spatial and multimedia databases

Submitting a project plan

by **2021-10-22** 23:59 **(Friday)**

One of the team members will upload a PDF document of the project plan into WIS. In the document, there will be a software specification (user requirements addressed by the software, a text description of the user interface, etc.; with the focus on data management) and a database specification (what will be stored in the database, i.e., what spatial and multimedia data, what and how the data will be queried; it should be a text description not a database design/SQL). Moreover, there should be a development plan sice now to the project deadline with 2 week iterations (a list of biweekly milestones).

Submitting a database schema

by **2021-11-05** 23:59 **(Friday)**

One of the team members will upload a valid SQL file/script of DDL statements into WIS. The statements will create database objects required by the software (a database schema, i.e., tables, constraints, indices, etc.). The SQL script must run without any errors (except for errors on DROP statements of missing database objects) in the campus Oracle database server. The database schema may not be final, it can be updated later according to needs of a final version of the software.

Submitting final results

by **2021-12-13** 23:59 **(Monday)**

One of the team members will upload an archive file (ZIP, TGZ) of the final content of the project repository (without .git directory), that is source-code files, additional files to build the source code (Makefile, Maven project, NetBeans, etc.), documentation, a description of how-to start the application. There can be also platform independent byte-code files in the archive (JAR files, not EXE files). If necessary the archive can be split to no more than 4 parts before uploaded into WIS where the maximal size of each part is 2MB.

In the root directory of the archive, there must be "points.txt" file which contains a points distribution scheme (see below).

Registration of teams

by **2021-10-19** 23:59 **(Tuesday)**

A team leader will register his/her team in WIS (see Teams on the course web-page in WIS) and assign the team members into the team.

The size of teams

Each team wont have more than 2 team members. One of the members is a team-leader who registers the team.

The project specification

Design and implement a client-server application that will demonstrate how spatial and multimedia data can be stored, processed, queried and presented. The data will be stored in Oracle database.

For example, you can implement an information system for travel agencies, real estate

agencies, store management, HR, geographical information system for various agencies.

Spatial database: Actions for inserting, deleting, and updating custom spatial data of at least 5 types of spatial entities with a map visualization and control (e.g., to move or re-size a spatial entity, a user can move the entity in a map). Moreover, there will be a non-trivial usage of one spatial operator, another 2 spatial operators or functions, and at least 3 analytic functions or on the spatial data.

Multimedia database: Actions for inserting, deleting, and updating custom multimedia data (e.g., static images with a rotation operation) and ability to query the multimedia by content (I.e, image search).

Client: The application should be implemented in Java (after previous agreement, you can use also PL/SQL, C++, .NET, etc.), it should have a graphical user interface (including help) and be executable on both Linux and Windows platforms. The application should **view and operate on both types of data** (spatial and multimedia) including their integration with relational data.

- The user interface should be able to view spatial and multimedia data.

- You can use only your source-code developed in the team and also standard libraries (e.g., Java SE/EE libraries, available, for example, in "JDK 7 with Java EE"), or libraries available in an integrated development environment (jDeveloper, NetBeans, or Eclipse), and Oracle libraries (available in labs). Any other source-code or libraries/components needs to be approved by the instructor (you should ask him by email with a link to a library and an explanation why and how it will be utilised).

- The users must be able to set login credentials for connection into the Oracle database and they should be able to (re)initialize the content of the database if necessary.

Server: database server Oracle Database Enterprise Edition available in the campus (for your login credentials, see WIS), and, optionally, also an (HTTP) application server.

Project work

In each team, all members must participate in the project equally. In the team project, it is required to use the GIT source-code version management repository.

The repository of the project must always contain all the data of the current state of the solution. Individual versions ("revisions") must be sent by the responsible team member (i.e., the author of the changes) and must contain a brief description of the changes (I.e., no commit should be done without comment, this will be checked during project evaluation).

It is recommended to work on a project continuously. The project repository will be monitored on a continuous basis (including the contents of the saved source files), version changes records and the interim repository content will be used in the final evaluation of the project and the evaluation of the individual team members. Unequal activity during the solution, especially the beginning of the solution in the second half or until the end of the semester, will lead to the loss of points in the final evaluation.

Each member of the team should be aware of the ongoing work of others, especially through the version management tool (proof records of changes and the actual repository content). The first check is to be done before the half-semester (before the semi-semester test), further checks are recommended at weekly intervals (all members of the team are recommended to store the common records of the checks in the repository). In case of failure of cooperation, impossibility of mutual agreement and solution on the PDBe forum it is recommended to contact the instructor. Team changes can be made at least 21 days prior to submitting the project.

Documentation

Program documentation generated automatically from properly commented source codes using the appropriate tool (Javadoc, Doxygen). For each module, give its author, title, description of functionality and usage.

Develop **the user documentation** according to the expected usage of the application. In the case of a sufficiently intuitive user interface, a simple help in the application is sufficient.

Evaluation

For evaluation, **all results (project plan, database schema, and final result) must be submitted in time**. These results are evaluated together in the final defense of the project, when **two team members divide a total of 40 points**, down 20 points for each member who did not participate. Standard points per team member is 0-20, maximum 25 points. A **points distribution scheme** must be included in the "points.txt" file submitted into WIS as a part of the project (in its root directory).

During the project defense, the proposed points distribution scheme may be adjusted by the instructor according to reality (in particular on the basis of evidence of changes and the ongoing content of the repository, see section "Project work"), but always individually for individual members (without transferring the points taken or added to others). Team members whose work will be artificially overvalued (their greater share of the project cannot be proven in the defense), the redundant points will be removed (without compensation for other members). In the event of underestimation, points may be added. Reallocation of points between team members, that is the modification of the points distribution scheme, will not be allowed after the project submission.

If one or more team members stop attending the project and they will score 0 points, it is enough for the remaining team members to work out a proportionate part of the assignment (for example, a one-member team could successfully submit a project meeting only two members 1/2 of the original requirements, an additional work is beyond the scope of the obligations and can be rated by premium points). However, the functionality of a (partial) solution must be sufficient to be shown in the defense (I.e., functions unavailable from the user interface or not utilized source code will not be evaluated, even if implemented).

The "points.txt" file contains 2 lines of *xlogin00 <percent>*, which determines the percentage distribution of points according to the opinions of all team members. Each value must be in the range of 50-125% or 0 and their sum must not exceed 200% reduced by 100% for each member who did not participate in the solution. The file also describes the mapping of individual parts of the application features to their authors and further information on the progress of the solution so that it is possible to determine the extent and character of the work done by the individual members.

The sample content of the "points.txt" file:

```
xaaaaa01                 125%
xbbbbb02                 75%
The team leader is John Smith (xsmith01) who implemented a client-
server communication layer and a user interface...
```

Solve **problems in the team** in a timely manner (immediately after detection under continuous review, at least 21 days before the submission) by mutual agreement, on a PDBe lecture or during a personal consultation (with clear evidence of unexpected circumstances or otherwise unusual course of the solution).

Points

In order to obtain **the full number of point**s, all the results must be submitted and an application must meet all the requirements presented here (see the section "Project specification", especially its part describing the spatial and multimedia database requirements). The solution must be submitted including **relevant documentation** (see "Documentation"). In addition, there must be **ongoing work on the project** during the semester (evaluated based on evidence and commented records of changes in the repository, see "Project work").

In addition, **premium points** with a maximum of 25% of the basis points can be earned by a significantly above-standard solution containing additional functionality or features not explicitly stated in the assignment (however, the individual solver can not total more than 25 points). For example, you can implement a live view of spatial data reflecting the data changes being done by other database clients; object-relational mapping in the application of persistent objects with their spatial and multimedia data, etc.).

Failure to comply with formal requirements may cause the project not to be evaluated.

Projects not submitted, or submitted after the deadline, will not be evaluated.

A violation of academic rules or ethics will also be investigated.

Consultants

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