Tour Planner

This desktop application is developed based on the GUI framweorks C# / WPF or Java / JavaFX. The user creates (bike-, hike-, running- or vacation-) tours in advance and manages the logs and statistical data of accomplished tours.

Goals

- implement a **graphical-user-interface** based on WPF or JavaFX (supported) or another markup based UI framework
- define your own reusable **UI-component**
- apply the **MVVM-pattern** in C# / **Presentation-Model** in Java
- structure your application in seperate **layers** e.g.: business-layer (BL), data-access-layer (DAL), view-model (VM), user-interface (UI)
- store the tour-data and tour-logs in a postreSQL **database**; images should be stored externally on the file-system
- implement **design-patterns** in your project
- use a **logging** framework like log4net or log4j (or Serilog or using Microsoft.Extensions-Solution)
- generate a **report** by using an appropriate library of your choice
- generate your own **unit-tests** with JUnit or NUnit
- use **documentation-annotations** in the source-code; to be used in a document-generator like Doxygen or Sandcastle.
- **configuration** (db-connection, base-directory) in seperate config-file - not in the sourcecode

MUST HAVES

In case you don't implement the following minimal required goals, the hand-in is automatically evaluated as 0 points (grade: 5, F, de: "Nicht Genügend").

- use a UI technology based on Markup Language (Avalonia, UNO, …)
- use the mentioned technologoies / frameworks (see also mandatory technologoies below)
- implement the defined GUI-pattern
- use at least one design pattern (and mention it in the protocol)
- store at least some data in the database
- store all your config in a config file
- implement at least 20 unit tests

Features

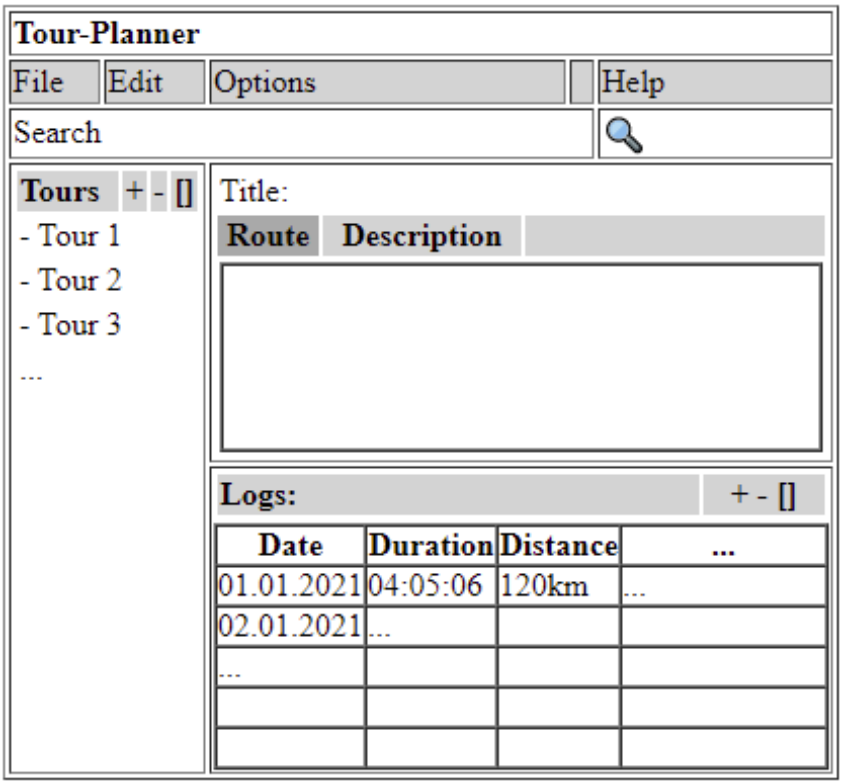
- the user can create new **tours** (no user management, login, registration… everybody sees all tours)
- every tour consists of **name**, **tour description**, **route information** (an image with the tour map) and **tour distance**
  - the image should be retrieved by a REST request using (https://developer.mapquest.com/documentation/directions-api/)
- tours are managed in a list, can be **created**, **modified**, **deleted**, **copied** (CRUD)
- **import and export** of tour data (file format of your choice).
- for every tour the user can create new **logs** of the accomplished tour statistics
- multiple **logs** are assigned to one **tour**
- a tour-log consists of **date/time**, **report**, **distance**, **total time**, and **rating** taken on the tour
- add **five more properties** for the tour-log of your choice (f.e. average speed, joule for bicycle-tours)

- **full-text search** in tour- and tour-log data
- the user can print a **tour-report** of one tour with all its logs
- a second **summarize-report** for statistical analyses should also be generated, summarize total-time and -distance over all tour-logs
- add a **unique feature**

Optional Bonus Features (bonus points)

- consider that different UIs can work on tour data, so that data needs to be in sync between different UIs
- consider that different UIs should not be able to overwrite their work
- create a **REST-server** that is responsible for data management and persistence
  - you can use any helper class like .NET's HTTPListener or Java's HttpServer.

User-Interface



Hand-Ins

Create an desktop-application in C# or Java based on the mentioned GUI-frontends which fulfill the requirements statet in this document. You are not allowed to use object-relational-mappers (ORM), instead the data-layer has to be implemented on your own. Add unit tests (20+) to cerify your application code.

Add five or more properties (mandatory) as extensions for the tour-log and use them at least in the statistical report.

Add a protocol as pdf with the following content:

- protocol about the technical steps you made (designs, failures and selected solutions)
- explain why these unit tests are chosen and why the tested code is critical
- track the time spent with the project
- consider that the git-history is part of the documentation (no need to copy it into the protocol)

The final presentation is done in a 10min presentation at the end of the semester (date will be provided soon)

- present the working solution with all aspects
- execute the unit-tests and explain the results
- present the key items of your protocol (see above)

Mandatory Technologies

- C# / Java as desktop application
- GUI-framework WPF (for C#) or JavaFX (for Java) or another Markup-Language-based UI Framework
- SQL (no OR-mapper)
- HTTP for communication to MapQuest
- JSON.NET / Jackson for JSON serialization & deserialization
- Database Engine postgreSQL with the ADO.Net- (for C#) or JDBC- (for Java) API
- Logginglog4j (Java) or log4net (C#) or another .NET Microsoft.Extensions-Solution.
- a report-generation library of your choice
- NUnit / JUnit

Grading (50 points)

- 35: functional requirements
  - GUI in general
    - (graphical and software) design
    - function
    - unique feature
  - tours
    - create/modify/delete a tour
    - view/manage tours in a list
    - input-validation
  - tour-logs
    - add/modify tour-logs assigned to a tour
    - view/manage tour-logs as list
  - full-text search
  - generate reports
- 10: non-functional requirements
  - persistence
  - configuration
  - unit-tests
  - source-documentation generated
- 05: protocol
  - design
  - lessons learned
  - unit test design
  - time spent
  - link to git
- 05: bonus points