



# KNOWLEDGE-BASED COMPUTATIONAL INTELLIGENCE AND DATA MINING IN BIOMEDICINE

## Graded Assignments



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# Graded Laboratory Assignments



## What will be evaluated and graded in the 1<sup>st</sup> part of the semester?

1. Use CI tools of RapidMiner to a non-trivial biomedical data, create a model for classification, clustering, or regression that achieves possibly high performance. Use various blocks like: Optimize Parameters, Compare ROCs together with at least tree different methods, Cross Validation, Normalize. Try to find or optimize the hyperparameters of this model, not using default values or the auto-model built-in creator.
2. Develop a CNN (take care of the structure of the network) for a multi-classification of non-trivial biomedical data (e.g. images) and try to find and optimize various hyperparameters of this model and use regularization, optimization strategies to fit is as well as possible.
3. Implement a data mining system that allows to find out frequent patterns in any biomedical dataset for given threshold values.
4. Implement a recommendation associative system based on an associative graph data structure (AGDS) that allows quickly group (training) examples by similarity and find the most similar ones to any given input criteria.



# Graded Project Assignment

## Your project assignment should:

- Choose or collect a dataset of biomedical data that interests you the most from classification, prediction, recommendation, clustering, or data mining point of view.
- Solve one chosen CI or DM task and achieve high performance.
- Choose or prepare the training data you want to work with.
- Develop one or more computational models and try to optimize them to solve the chosen CI or DM problem.
- Use more advanced models, hyperparameters, optimizers, training techniques to increase accuracy, and decrease errors.
- Take care of the generalization of the model to be high!
- You can also implement your solution from scratch not using only the high-level functions that implement models.
- Try to combine models, not only play with hyperparameters.

