Grundlagen der Artificial Intelligence und Logik

- Übungsblatt 1 -

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Individual Exercises (10 P)

- Visit https://checkr.tugraz.at/ (a TU Graz software, login using your TU Graz account).
- At https://checkr.tugraz.at/, enter the key **uYY3W7**
- Provide your answers to the posed questions - several tries are possible (20 mins waiting time)!
- If all questions have been answered correctly, this corresponds to 10 points (each correctly answered question corresponds to 0.5 points).
- **No explicit „Abgabe“ is needed for this part (just answer the questions in KnowledgeCheckR)!**

Group Exercises (20P)

a. Which search approach would you use for solving the “Travelling Salesman Problem (TSP)” within 1 second with 2000 different connection points? Explain your choice. (**1P**)

b. Given the Constraint Satisfaction Problem x1[1..3], x2[1..3], c1:x1>x2, c2:x2=2. Show the solution search with backtracking + forward checking. (**2P**)

c. Implement the configuration knowledge base of slide **#18** (slide set on “Constraint Satisfaction”) on the basis of a genetic algorithm – the genetic algorithm should support the search for a solution. (**4P**)

d. Implement the TSP in MiniZinc for 10 connection points denoted as {cp1, cp2, .., cp10}. Assure that cp2 is always the first point (of the round trip) and cp5 follows cp3 in each solution (no optimal solution needed). (**6P**)

e. Implement a solution search for the resource allocation task of slide **#16** on the basis of MiniZinc (download the system from www.minizinc.org). (**7P**)

f. “Abgabe”: submit the well-explained solutions (!) of your group as one integrated .pdf to TeachCenter (the developed code has to be integrated into the .pdf)! Selected groups will present their solution also by executing the code.

„ConGuess“ Competition

- **AI Competition**: announced by the international AI-based Constraint Satisfaction Community (March 1 – July 31st, TU Graz employment)
- **Idea**: implement an App (iOS or Android App/Playstore) based on Constraint Satisfaction Problem (CSP) representations
- **Evaluators**: leading researchers in Constraint-based Reasoning
- **Opportunity**: to present your work to renowned researchers in the field of Artificial Intelligence
- **ConGuess idea**: gamification-based app, where users guess consistent configurations given a set of automatically pre-generated constraints. After having completed a set of related configuration tasks, users are ranked related to their performance with regard to the criteria "time needed" and number of consistent estimates. The role of constraint technologies: evaluate the consistency of configurations.
- **Winner**: 500 EUR from constraint community.
- **Interested?** Write an email to: alexander.felfernig@ist.tugraz.at

Thank You!

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