Part I

Organizational Matters

- Modul: IN2003
- Name: “Efficient Algorithms and Data Structures”
  “Effiziente Algorithmen und Datenstrukturen”
- ECTS: 8 Credit points
- Lectures:
  - 4 SWS
    Mon 10:00–12:00 (Room Interim2)
    Fri 10:00–12:00 (Room Interim2)

Required knowledge:
- IN0001, IN0003
  “Introduction to Informatics 1/2”
  “Einführung in die Informatik 1/2”
- IN0007
  “Fundamentals of Algorithms and Data Structures”
  “Grundlagen: Algorithmen und Datenstrukturen” (GAD)
- IN0011
  “Basic Theoretic Informatics”
  “Einführung in die Theoretische Informatik” (THEO)
- IN0015
  “Discrete Structures”
  “Diskrete Strukturen” (DS)
- IN0018
  “Discrete Probability Theory”
  “Diskrete Wahrscheinlichkeitstheorie” (DWT)

The Lecturer

- Harald Räcke
- Email: raecke@in.tum.de
- Room: 03.09.044
- Office hours: (by appointment)
### Tutorials

A01 Monday, 12:00–14:00, 00.08.038 (Stotz)
A02 Monday, 12:00–14:00, 00.09.038 (Kohler)
A03 Monday, 14:00–16:00, 03.10.011 (Sperr)
B04 Tuesday, 12:00–14:00, 03.11.018 (Kohler)
B05 Tuesday, 14:00–16:00, 00.08.038 (Matl)
B06 Tuesday, 16:00–18:00, 00.08.036 (Sperr)
C07 Wednesday, 10:00–12:00, 01.13.010 (Stotz)
D08 Thursday, 10:00–12:00, 00.08.038 (Kraft)
E09 Friday, 12:00–14:00, 00.13.009 (Kraft)
E10 Friday, 14:00–16:00, 00.08.036 (Matl)

### Assignment sheets

In order to pass the module you need to pass an exam.

### Assessment

Assignment Sheets:

- An assignment sheet is usually made available on Monday on the module webpage.
- Solutions have to be handed in in the following week before the lecture on Monday.
- You can hand in your solutions by putting them in the mailbox "Efficient Algorithms" on the basement floor in the MI-building.
- Solutions have to be given in English.
- Solutions will be discussed in the tutorial of the week when the sheet has been handed in, i.e., sheet may not be corrected by this time.
- You can submit solutions in groups of up to 2 people.

- Submissions must be handwritten by a member of the group. Please indicate who wrote the submission.
- Don’t forget name and student id number for each group member.
Assessment

Assignment can be used to improve your grade

▶ If you obtain a bonus your grade will improve according to the following function

\[ f(x) = \begin{cases} \frac{1}{10} \text{round} \left( 10 \left( \frac{\text{round} (3x) - 1}{3} \right) \right) & 1 < x \leq 4 \\ \text{otw.} \end{cases} \]

▶ It will improve by 0.3 or 0.4, respectively.

Examples:

▶ 3.3 → 3.0
▶ 2.0 → 1.7
▶ 3.7 → 3.3
▶ 1.0 → 1.0
▶ > 4.0 no improvement

Requirements for Bonus

▶ 50% of the points are achieved on submissions 1–7,
▶ 50% of the points are achieved on submissions 8–13,
▶ each group member has written at least 4 solutions.

1 Contents

▶ Foundations
  ▶ Machine models
  ▶ Efficiency measures
  ▶ Asymptotic notation
  ▶ Recursion
▶ Higher Data Structures
  ▶ Search trees
  ▶ Hashing
  ▶ Priority queues
  ▶ Union/Find data structures
▶ Cuts/Flows
▶ Matchings

2 Literatur

2 Literatur


Jon Kleinberg, Eva Tardos: Algorithm Design, Addison-Wesley, 2005


Uwe Schöning: Algorithmik, Spektrum Akademischer Verlag, 2001


2 Literatur