

Foundations of Artificial Intelligence

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Exercise Sheet 9

Due: Friday, June 29, 2007

Exercise 9.1 (Interval Calculus)

Define the predicates *Before/2*, *After/2*, *During/2* and *Overlap/2* in predicate logic. Use only the predicate *Meet/2* as defined in the lecture and the predicates you have defined yourself. I.e., do not use the predicate $<$.

All predicates have two intervals as arguments. The duration of an interval is never 0.

Exercise 9.2 (Probability Theory)

Assume the following statistical facts about a very good class of AI students:

- 70% of the students achieve a good score in the exam. The probability that a student from this group has solved the exercise sheets himself is 0.9.
- 20% of the students achieve a bad score in the exam. The probability that a student from this group has solved the exercise sheets is 0.2.
- 10% of the students do not pass the exam. The probability that a student from this group has solved the exercise sheets is 0.05.

Formalize these statements and calculate

- (i) the probability that a student from this class achieves a good score, if it is known that he has always solved the exercises,
- (ii) the probability of success for an equally hard-working student that is from a different class, in which one third achieve good and bad scores respectively and one third fail.
- (iii) Is it more promising for a student to be from a good class compared to the case in which—no matter from which class—he/she solves all exercises?

The exercise sheets may and should be worked on in groups of three (3) students. Please write all your names and the number of your exercise group on your solution.