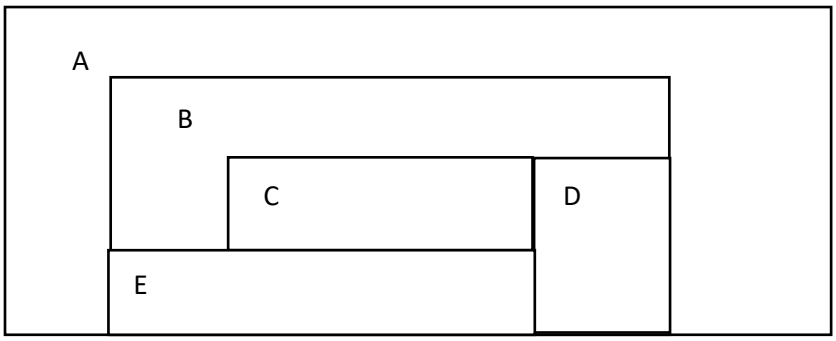
Real world problems

Knowledge Representation & Logical Programming (Practical)

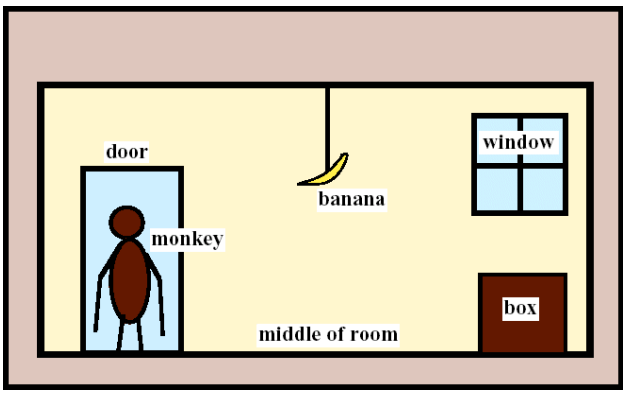
1. The three friends, Bill, Daniel, and Michael, live in different cities and have jobs. Each year, they meet in Zurich, where one lives, and participate in the Silvester run. This time, Michael was faster than his friend from Bern, and Daniel was more rapid than the Bank manager. The quickest was the sports teacher, as always. Daniel lives in Basel, and Michael is a doctor. Find all person's details: Name, job, city, and race rank.

2. Water jug problem:
   You have 2 jugs of 4L and 3L and an unlimited supply of water. Can you measure the exact amount of 2L water from that. Neither jug has any measuring mark on it. Eliminate consecutive duplicates of list elements.

3. Write a Prolog program that finds all admissible colorings of a given map (no two adjacent regions may not have the same color) using the colors red, blue, yellow, and green.



4. There is a monkey at the door into a room. In the middle of the room a banana is hanging from the ceiling. The monkey is hungry and wants to get the banana, but he cannot stretch high enough from the floor. At the window of the room there is a box the monkey may use. Find how the monkey can grasp the banana.



5. A farmer wants to cross a river and take with him a wolf, a goat, and a cabbage. There is a boat that can fit himself plus either the wolf, the goat, or the cabbage. If the wolf and the goat are alone on one shore, the wolf will eat the goat. If the goat and the cabbage are alone on the shore, the goat will eat the cabbage. How can the farmer bring the wolf, the goat, and the cabbage across the river?

6. There are three missionaries and three cannibals must cross a river using a boat which can carry at most two people, under the constraint that, for both banks, if there are missionaries present on the bank, they cannot be outnumbered by cannibals (if they were, the cannibals would eat the missionaries). The boat cannot cross the river by itself with no people on board. Find the solution for the successful river crossing.