

Tutorial 1 in Cognitive Systems

1. What is the meaning of the following terms? Give (at least) one example per term, please!
 - creative,
 - cognitive,
 - intelligent, and
 - Artificial Intelligence
2. Imagine, there is a road and a chicken next to it.
 - (a) Please answer the question spontaneously: “Why did the chicken cross the road?”
 - (b) Found your answer by explaining, at first, how you understand the question.
 - (c) What are other possibilities to apprehend the question? Please create categories.
 - (d) Regard the following examples (they will be given in the tutorial) and sort them in the corresponding categories! Create new categories if it is necessary.
3. There are 10 objects placed on a laboratory desk. Each has exactly one occurrence of the following attributes:
 - design: ball, cube, pyramid
 - colour: red, white, green, yellow
 - material: wood, metal, plastic
 - (a) How many possibilities exist to load the laboratory desk with 10 objects if they (even with same design, colour, material) are ordered?
 - (b) How many possibilities exist to load the laboratory desk with 10 objects if the objects (even with same design, colour, material) are **not** ordered?
 - (c) In the possibilities from a), how many of these includes the subset of 3 objects: a *red metal ball*, a *red wooden cube*, and a *white plastic ball*?
 - (d) How to analyse if a given ordered subset include the following objects in a “relatively” efficient manner: a *red metal ball*, a *red wooden cube*, and a *white plastic ball*?
 - (e) Let N be the number of objects and each has k attributes with e_j characteristics. The attributes and the corresponding characteristics span a parameter space.

In general, why is it even for computer difficult to calculate results if the values of N , k , e_j increase?
 - (f) What is the meaning of the term “**curse of dimensionality**”? How do human beings and cognitive systems, respectively, deal with it?