ARTIFICIAL INTELLIGENCE

## ASSIGNMENT – 2

PROBLEMS:

For this assignment you will be writing simple prolog programs. Please submit the prolog file along with sample output.

> **Warning:** We will use random generator to pick and call 20 people. We will give them a simple prolog problem to solve, right in front of us. If you do the below assignments by yourself, it should take you 3 minutes or less to solve it. If you fail you will receive 0 for this assignment. Of course, in addition, you will receive a penalty of 20 towards your overall grade. The chances of you getting caught for plagiarism is 1/20. But I strongly recommend against rolling the dice.

Let us start with the understanding of the below phylogenetic tree. The words in Blue represents 'Family'. The words in red represents 'Genus'. The words in black/green is the 'species' and the words in italics is the common name. We use green only when a species has one or more subspecies.

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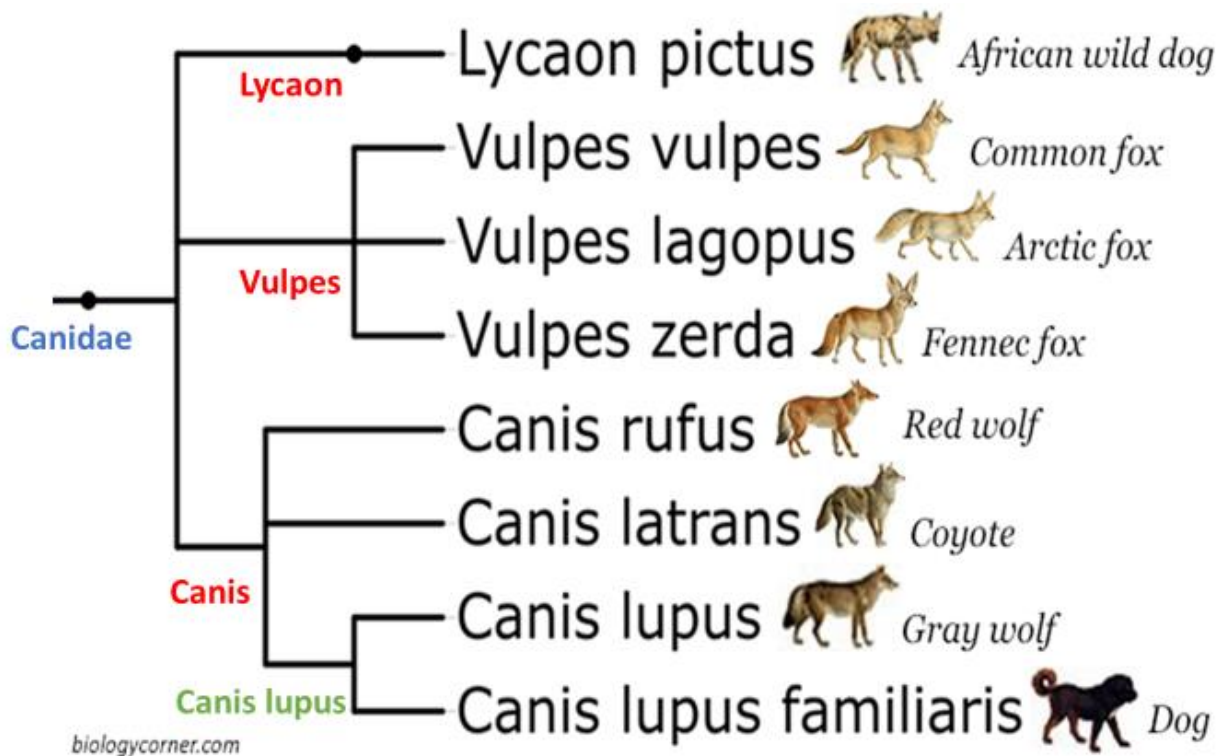
For example, the red-wolf can be described as follows

Common name: red-wolf

Species-name: Canis Rufus

Write prolog statements to represent the above phylogenetic tree. You can use the common-name as the symbol representing the species and use predicates to represent the rest of the information. Please

define the following predicates to represent the tree
1. **species-name**(<symbol>, <species-name>) [3 point]
2. **species-genus**(<species-name>, <genus>) [3 point]
3. **genus-family**(<genus>, <family>) [3 point]

Note: It is slightly tricky to represent 'Dog'. [1 point]

Once the tree is represented, define the following predicates to query about the tree

common-genus (X,Y) – true if X and Y symbol-name are from the same genus [4 points]

Note: Similarly, **common-species** [1 point]

As in prolog, any unbound variable should list all possible bindings i.e. if I query for common-genus (red-wolf, X) then the answer X = coyote, grey-wolf, dog

In addition, define a predicate **relation-path** (A, B, X) where the list X is the path from animal A to animal B in the tree. The first element is A and the last element is B. For example, the relationship path between Gray Wolf and Red Wolf is as follows:

Gray Wolf ←→ ***Canis Lupus*** ← → ***Canis*** ← → ***Canis Rufus*** ← → ***Red Wolf*** [5 points]