Name: NIM:

Homework 2
TK2ICM: *Logic Programming* (CSH4Y3)
Theoretical Homework (*Non-programming*)
Second Term 2018-2019

Due date : Tuesday, February 19, 2019 at 10:00 a.m. CeLoE time

Type : ***open all***, *individual, cooperation is allowed*

Instruction:

1. This homework is due **Tuesday February 19 at 10:00 a.m. CeLoE time**. Please submit your homework through the submission slot at CeLoE. You are allowed to discuss these problems with other class participants, but make sure that you solve the problem individually. Copying answers from elsewhere without understanding them will not enhance your knowledge.
2. You may use any reference (books, slides, internet) as well as ask other students who are not enrolled to this class.
3. Present your analysis neatly and legibly. Any detailed and relevant argument is appreciated.
4. Use the predicate name as described in each of the problem. **The name of the predicate must be precisely identical**.
5. Submit your work to the provided slot at CeLoE under the file name `Hw2-<your_name>.pdf`. For example: `Hw2-Albert.pdf`. Please see an information regarding your nickname at google classroom.

Remark 1 This homework is a theoretical problem.

Suppose that we are working with the knowledge base in Prolog Script 1.

Prolog Script 1

```
house_elf(dobby).

witch(hermione).
witch('McGonagall').
witch(rita_skeeter).

wizard(grindelwald).
wizard(dumbledore).

muggle(petunia).
muggle(vernon).

magic(X):- house_elf(X).
magic(X):- wizard(X).
magic(X):- witch(X).
```

Problem 1 (20 points) Draw a search tree for the query `?- magic(hermione).`.

Problem 2 (20 points) Draw a search tree for the query `?- magic(X).`.

Problem 3 (20 points) Draw a search tree for the query `?- muggle(vernon).`.

Problem 4 (20 points) Draw a search tree for the query `?- muggle(X).`.

Problem 5 (20 points) Draw a search tree for the query `?- magic(petunia).`.

Remark 2 For answering the above problem, please refer to the notations used in the textbook "Learn Prolog Now" (the link for the online version is available at CeLoE).