Университет ИТМО

Факультет ФПИ и КТ

### Отчёт

### по лабораторной работе 1

**Системы Искуственного Интеллекта**

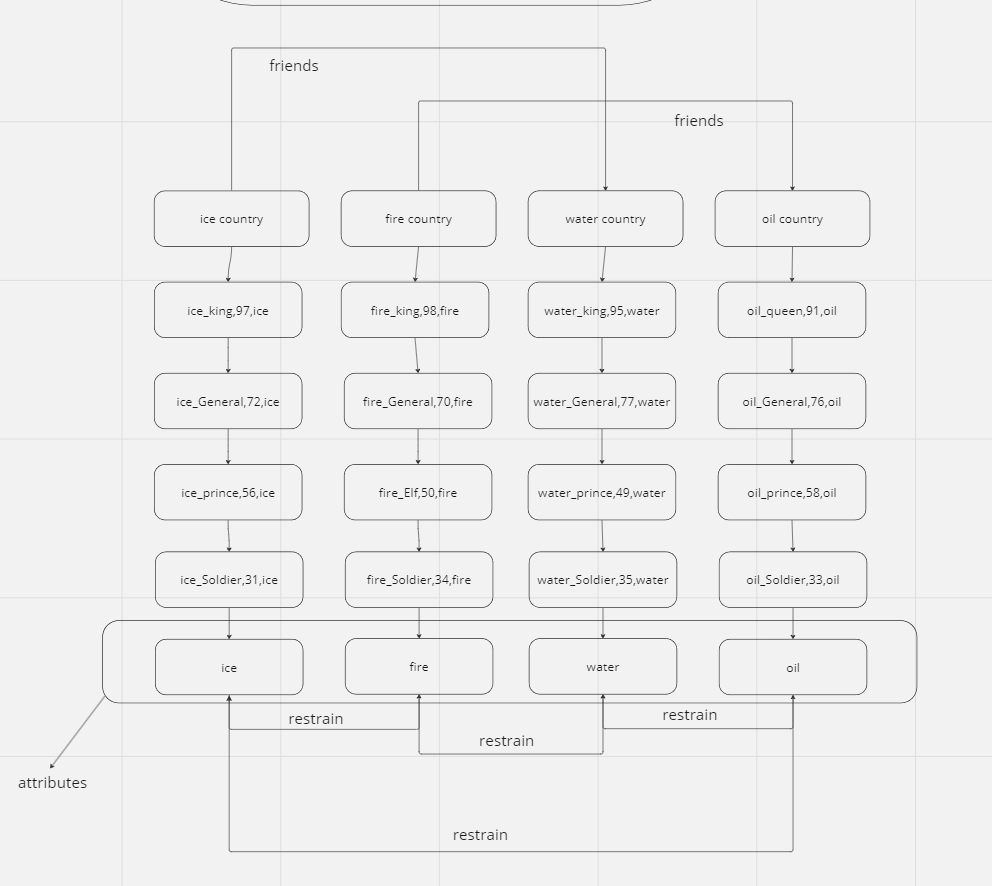
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**Задача:**

Требуется создать базу знаний в языке программирования Prolog и реализовать набор запросов, используя эту базу знаний. Задача направлена на развитие навыков работы с фактами, предикатами, и правилами в логическом программировании. Любая, связанная с играми



**Код:**

% facts

country(ice\_country).

country(fire\_country).

country(water\_country).

country(oil\_country).

ice\_country(ice\_king).

ice\_country(ice\_prince).

ice\_country(ice\_General).

ice\_country(ice\_Soldier).

fire\_country(fire\_king).

fire\_country(fire\_General).

fire\_country(fire\_Soldier).

fire\_country(fire\_Elf).

water\_country(water\_king).

water\_country(water\_prince).

water\_country(water\_General).

water\_country(water\_Soldier).

oil\_country(oil\_queen).

oil\_country(oil\_prince).

oil\_country(oil\_General).

oil\_country(oil\_Soldier).

level(ice\_king,97,ice).

level(ice\_prince,56,ice).

level(ice\_General,72,ice).

level(ice\_Soldier,31,ice).

level(fire\_king,98,fire).

level(fire\_General,70,fire).

level(fire\_Soldier,34,fire).

level(fire\_Elf,50,fire).

level(water\_king,95,water).

level(water\_prince,49,water).

level(water\_General,77,water).

level(water\_Soldier,35,water).

level(oil\_queen,91,oil).

level(oil\_prince,58,oil).

level(oil\_General,76,oil).

level(oil\_Soldier,33,oil).

good\_relationship(water,ice).

good\_relationship(ice,water).

good\_relationship(fire,oil).

good\_relationship(oil,fire).

good\_relationship(fire,fire).

good\_relationship(oil,oil).

good\_relationship(ice,ice).

good\_relationship(water,water).

good\_relationship2(water\_country,ice\_country).

good\_relationship2(ice\_country,water\_country).

good\_relationship2(fire\_country,oil\_country).

good\_relationship2(oil\_country,fire\_country).

restrain(water,fire).

restrain(fire,ice).

restrain(ice,oil).

restrain(oil,water).

attributes(water).

attributes(fire).

attributes(ice).

attributes(oil).

% rules

%if level A higher than level,we think A will defeat B

win(A,B):-level(A,Level1),level(B,Level2),Level1>Level2.

lost(A,B):-level(A,Level1),level(B,Level2),Level1<Level2.

tied(A,B):-level(A,Level1),level(B,Level2),Level1=Level2.

%when A is restrained by B, but A defeats B(in this situation，The level of A needs to be 5 higher than that of B )

was\_restrained\_but\_defeating(A,B):-level(A,Level1,Attribute1),level(B,Level2,Attribute2),restrain(Attribute1,Attribute2),Level1-5>Level2.

%when A restrained B, and A defeats B(in this situation，The level of A can be 5 lower than that of B)

restrained\_and\_defeating(A,B):-level(A,Level1,Attribute1),level(B,Level2,Attribute2),restrain(Attribute1,Attribute2),Level1+5>Level2.

%when A is restrained by B, and A lost to B(in this situation，The level of A need to be 5 lower than that of B)

was\_restrained\_and\_lost(A,B):-level(A,Level1,Attribute1),level(B,Level2,Attribute2),restrain(Attribute1,Attribute2),Level1-5<Level2.

%when A restrained B, and A lost to B(in this situation，The level of A can be 5 higher than that of B)

restrained\_but\_lost(A,B):-level(A,Level1,Attribute1),level(B,Level2,Attribute2),restrain(Attribute1,Attribute2),Level1+5<Level2.

% Master,Grandmaster,and Challenger(Master is from 30 to 55,Grandmaster is from 56 to 75,Challenger is from 76 to 99)

is\_Master(A):- level(A,Level1,Attribute1),attributes(Attribute1),Level1>29,Level1<56.

is\_Grandmaster(A):- level(A,Level1,Attribute1),attributes(Attribute1),Level1>55,Level1<76.

is\_Challenger(A):- level(A,Level1,Attribute1),attributes(Attribute1),Level1>75,Level1<100.

% is\_superiors means it means your superiors, you accept their jurisdiction

is\_superiors(A,B):-level(A,Level1,Attribute1),level(B,Level2,Attribute2),Attribute1=Attribute2,Level1>Level2.

country\_is\_friends(A,B):-country(A),country(B),good\_relationship2(A,B).

people\_is\_friends(A,B):-level(A,Level1,Attribute1),level(B,Level2,Attribute2),A\=B,Level1+Level2<999,good\_relationship(Attribute1,Attribute2).