

Национальный исследовательский университет информационных
технологий, механики и оптики

Факультет ПИиКТ

Системы искусственного интеллекта

Лабораторная работа №1

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Задание

Составить базу знаний на языке Пролог, которая будет содержать генеалогическое дерево семьи с указанием родственных отношений (например, папа, бабушка и т.д.), опираясь на два первичных факта: родитель и супруг.

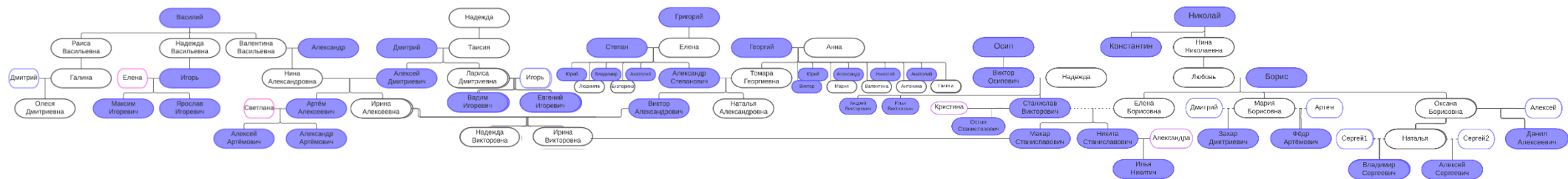
База знаний

| | | |
|--|--|---|
| male(victor_a). male(aleksey_d). male(artem_a). male(alexander_a). male(aleksey_a). male(vadim_i). male(evgeniy_i). male(igor_l). male(dmotriy). male(alexander). male(vasiliy). male(igor). male(maxim_i). male(yaroslav_i). male(dmitriy_g). male(grigoriy). male(stepan). male(alexander_s). male(yuri_s). male(anatoliy_s). male(vladimir_s). male(georgiy). male(yuri_g). male(alexander_g). male(nikolay_g). male(anatoliy_g). male(victor_g). male(makar_s). male(nikita_s). male(ilya_n). male(stanislav_v). male(ostap_s). male(ilya_v). male(andrey_v). male(victor_o). male(osip). male(nikolay). male(konstantin_n). male(boris). male(aleksey_o). male(danil_a). male(dmitriy_m). male(zakhar_d). male(artem_m). male(fedr_a). male(sergey_n1). male(sergey_n2). male(vladimir_s1). male(aleksey_s2). | famale(irina_a). famale(irina_v). famale(nadya_v). famale(svetlana). famale(nina_a). famale(valentina_v). famale(nadezda_v). famale(raisa_v). famale(galina). famale(olesya_d). famale(elena_i). famale(larisa_d). famale(taisya). famale(nadezda_t). famale(tomara_g). famale(natasha_a). famale(elena_g). famale(lydmila_s). famale(ekaterina_s). famale(anna). famale(maria_g). famale(valentina_g). famale(antonina_g). famale(galina_g). famale(aleksandra). famale(natalya). famale(elena_b). famale(maria_b). famale(oksana_b). famale(kristina). famale(nadezda). famale(lybov). famale(nina_n). parent(irina_a, irina_v). parent(victor_a, irina_v). parent(irina_a, nadya_v). parent(victor_a, nadya_v). parent(nina_a, irina_a). parent(aleksey_d, irina_a). parent(nina_a, artem_a). parent(aleksey_d, artem_a). parent(artem_a, alexander_a). parent(svetlana, alexander_a). parent(artem_a, aleksey_a). parent(svetlana, aleksey_a). parent(alexander, nina_a). parent(valentina_v, nina_a). parent(vasiliy, valentina_v). parent(vasiliy, nadezda_v). | parent(vasiliy, raisa_v). parent(nadezda_v, igor). parent(igor, yaroslav_i). parent(elena_i, yaroslav_i). parent(igor, maxim_i). parent(elena_i, maxim_i). parent(raisa_v, galina). parent(galina, olesya_d). parent(dmitriy_g, olesya_d). parent(dmitriy, aleksey_d). parent(taisya, aleksey_d). parent(dmitriy, larisa_d). parent(taisya, larisa_d). parent(nadezda_t, taisya). parent(larisa_d, vadim_i). parent(igor_l, vadim_i). parent(larisa_d, evgeniy_i). parent(igor_l, evgeniy_i). parent(tomara_g, victor_a). parent(alexander_s, victor_a). parent(tomara_g, natasha_a). parent(alexander_s, natasha_a). parent(stepan, alexander_s). parent(elena, alexander_s). parent(stepan, anatoliy_s). parent(elena, anatoliy_s). parent(stepan, vladimir_s). parent(elena, vladimir_s). parent(stepan, yuri_s). parent(elena, yuri_s). parent(stepan, lydmila_s). parent(elena, lydmila_s). parent(stepan, ekaterina_s). parent(elena, ekaterina_s). parent(grigoriy, elena). parent(georgiy, tomara_g). parent(anna, tomara_g). parent(georgiy, yuri_g). parent(anna, yuri_g). parent(georgiy, alexander_g). parent(anna, alexander_g). parent(georgiy, nikolay_g). parent(anna, nikolay_g). parent(georgiy, anatoliy_g). parent(anna, anatoliy_g). parent(georgiy, victor_g). parent(anna, victor_g). parent(georgiy, maria_g). parent(anna, maria_g). |
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| | | |
|---|---|--|
| parent(georgiy, valentina_g). parent(anna, valentina_g). parent(georgiy, antonina_g). parent(anna, antonina_g). parent(georgiy, galina_g). parent(anna, galina_g). parent(elena_b, makar_s). parent(stanislav_v, makar_s). parent(elena_b, nikita_s). parent(stanislav_v, nikita_s). parent(nikita_s, ilya_n). parent(aleksandra, ilya_n). parent(stanislav_v, ostap_s). parent(kristina, ostap_s). parent(nadezda, stanislav_v). parent(victor_o, stanislav_v). parent(osip, victor_o). parent(lybov, elena_b). parent(boris, elena_b). parent(lybov, maria_b). parent(boris, maria_b). parent(lybov, oksana_b). parent(boris, oksana_b). parent(nina_n, lybov). parent(nikolay, nina_n). parent(nikolay, konstantin_n). parent(maria_b, zakhar_d). parent(dmitriy_m, zakhar_d). parent(maria_b, fedr_a). parent(artem_m, fedr_a). parent(oksana_b, natalya). parent(oksana_b, dnail_a). parent(aleksey_o, dnail_a). parent(natalya, aleksey_s2). parent(sergey_n2, aleksey_s2). parent(natalya, vladimir_s1). parent(sergey_n2, vladimir_s1). | spouses(irina_v, makar_s). spouses(irina_a, victor_a). spouses(nina_a, aleksey_d). spouses(artem_a, svetlana). spouses(valentina_v, alexander). spouses(igor, elena_i). spouses(galina, dmitriy_g). spouses(taisya, dmitriy). spouses(larisa_d, igor_l). spouses(tomara_g, alexander_s). spouses(stepan, elena_g). spouses(georgiy, anna). spouses(nikita, aleksandra). spouses(victor_o, nadezda). spouses(lybov, boris). spouses(oksana_b, aleksey_o). spouses(elena_b, stanislav_v). | |
|---|---|--|



Правила:




mother(X, Y) :- female(X), parent(X, Y).
father(X, Y) :- male(X), parent(X, Y).
spouse(X, Y) :- spouses(X, Y); spouses(Y, X).
sibling(X, Y) :- mother(Z, X), mother(Z, Y), father(C, X), father(C, Y), X\=Y.
grandmother(X, Y) :- mother(X, Z), parent(Z, Y).
grandfather(X, Y) :- father(X, Z), parent(Z, Y).
ancestor(X, Y) :- parent(X, Y).
ancestor(X, Y) :- parent(X, Z), ancestor(Z, Y).
step-brother(X, Y) :- mother(Z, X), mother(Z, Y), father(M, Y), not(spouse(Z, M)), X\=Y, !;
father(Z, X), father(Z, Y), mother(M, Y), not(spouse(Z, M)), X\=Y.
uncle(X, Y) :- parent(Z, Y), sibling(Z, X), male(X);
parent(Z, Y), sibling(Z, M), spouse(M, X), male(X).
aunt(X, Y) :- parent(Z, Y), sibling(Z, X), female(X);
parent(Z, Y), sibling(Z, M), spouse(M, X), female(X).









Результаты проверок




| | | |
|--|---|---|
|  <code>parent(X, irina_v).</code> | |   |
| X | | |
| irina_a | 1 | |
| victor_a | 2 | |

| | | |
|---|---|---|
|  <code>sibling(makar_s, X).</code> | |   |
| X | | |
| nikita_s | 1 | |

| | | |
|--|----|---|
|  <code>ancestor(X, nadya_v).</code> | |   |
| X | | |
| irina_a | 1 | |
| victor_a | 2 | |
| nina_a | 3 | |
| aleksey_d | 4 | |
| alexander | 5 | |
| valentina_v | 6 | |
| vasiliy | 7 | |
| dmitriy | 8 | |
| taisiya | 9 | |
| nadezda_t | 10 | |
| tomara_g | 11 | |
| alexander_s | 12 | |
| stepan | 13 | |
| elena | 14 | |
| grigoriy | 15 | |
| georgiy | 16 | |
| anna | 17 | |

| | | |
|---|---|---|
|  <code>aunt(X, ilya_n).</code> | |   |
| X | | |
| irina_v | 1 | |

| | | |
|---|---|---|
|  <code>uncle(artem_a, X).</code> | |   |
| X | | |
| irina_v | 1 | |
| nadya_v | 2 | |

| | | |
|--|---|---|
|  <code>step-brother(makar_s, X).</code> | |   |
| X | | |
| ostap_s | 1 | |