

Университет ИТМО
Факультет программной инженерии и компьютерной
техники

Курс «Системы искусственного интеллекта»

Лабораторная работа № 2
Генеалогическое древо

Работу выполнил
Студент группы Р33101

Хуан Сыюань

Преподаватель
Игорь Александрович Бессмертный

Санкт-Петербург
2021

Оглавление

Оглавление	2
Задание	3
Выполнение л.р.	3
Ссылка на исходный код.	3
Граф семейного дерева	3
Код программы	3
Факты	3
Правила	6
Примеры выполнения запросов	8
Вывод	错误!未定义书签。

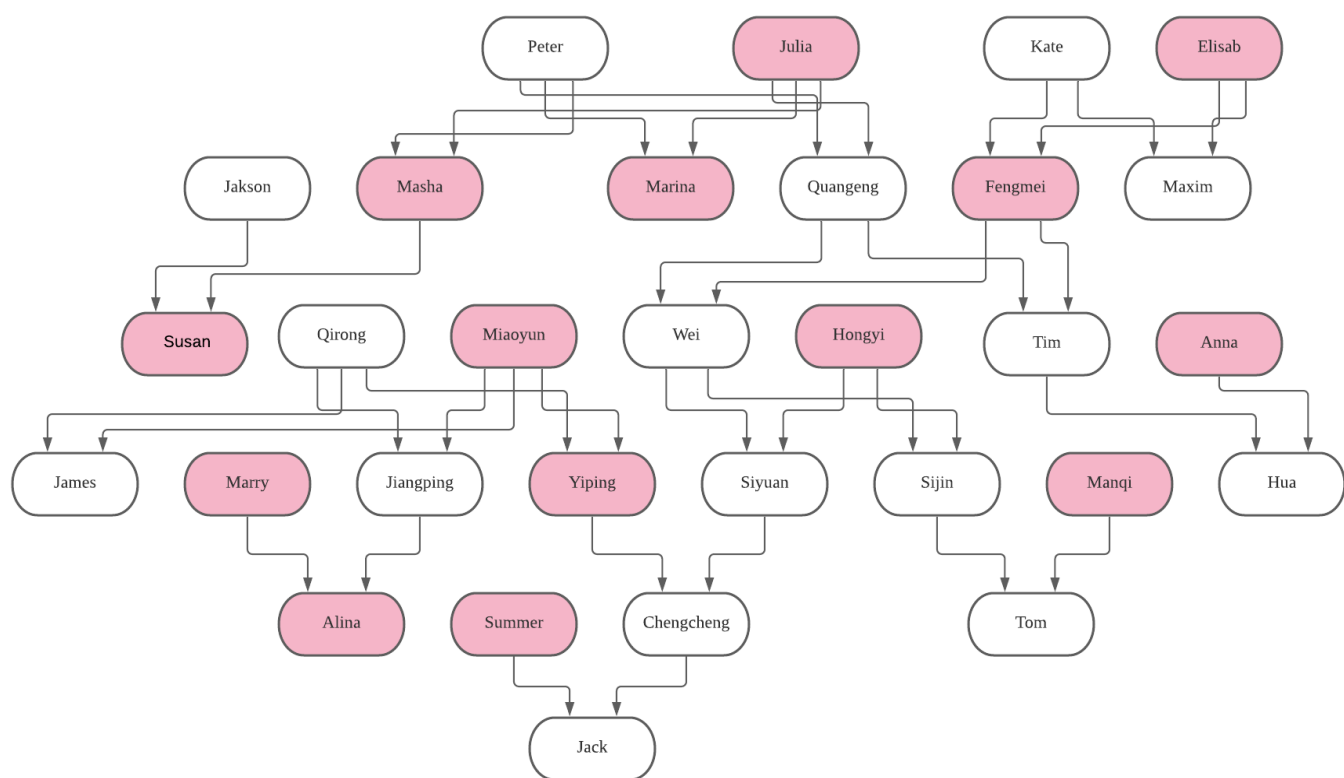
Задание

Создайте свое генеалогическое древо, содержащее не менее 30 человек. Если вы не знаете всех своих родственников, можете их придумать.

Создайте не менее 20 правил, например, бабушка и т.д.

Выполнение л.р.

Граф семейного дерева



[Граф семейного дерева.png](#)

Код программы

Факты

```

1 % --- Genders
2
3 % Male part
4 %----- Level 1 -----
5 male(peter).
6 male(kate).
7 %----- Level 2 -----
8 male(jaskon).
9 male(quangeng).
10 male(maxim).
11 %----- Level 3 -----
12 male(qirong).
13 male(wei).
14 male(tim).
15 %----- Level 4 -----
16 male(james).
17 male(jiangping).
18 male(siyuan).
19 male(sijin).
20 male(hua).
21 %----- Level 5 -----
22 male(chengcheng).
23 male(tom).
24 %----- Level 6 -----
25 male(jack).
26
27 % Female part
28 %----- Level 1 -----
29 female(julia).
30 female(elisab).
31 %----- Level 2 -----
32 female(masha).
33 female(marina).
34 female(fengmei).
35 %----- Level 3 -----
36 female(susan).
37 female(miaoyun).
38 female(hongyi).
39 female(anna).
40 %----- Level 4 -----
41 female(marry).
42 female(yiping).
43 female(manqi).
44 %----- Level 5 -----
45 female(alina).
46 female(summer).
47
48
49 % couple(Boy, Girl). It includes the lovers and real couples
50
51 %----- Level 1 -----
52 couple(peter, julia).
53 couple(kate, elisab).
54 %----- Level 2 -----
55 couple(jakson, masha).
56 couple(quangeng, fengmei).
57 %----- Level 3 -----
58 couple(qirong, miaoyun).
59 couple(wei, hongyi).
60 couple(tim, anna).
61 %----- Level 4 -----
62 couple(marry, jiangping).
63 couple(yiping, siyuan).
64 couple(sijin, manqi).

```

```

65 %----- Level 5 -----
66 couple(summer, chengcheng).
67
68 % IF couple is boys with girls, so girls with boys too :)
69 couple(Girl, Boy) :-
70     % the '!' is in order to stop the meaningless loop
71     couple(Boy, Girl), !.
72
73 % This part is about the relationship between
74 % parents and children.
75
76 %----- Level 1-2 -----
77 parent(peter, masha).
78 parent(peter, marina).
79 parent(peter, quangeng).
80 parent(julia, masha).
81 parent(julia, quangeng).
82 parent(julia, marina).
83 parent(kate, fengmei).
84 parent(kate, maxim).
85 parent(elisab, fengmei).
86 parent(elisab, maxim).
87 %----- Level 2-3 -----
88 parent(jakson, susan).
89 parent(masha, susan).
90 parent(quangeng, wei).
91 parent(quangeng, tim).
92 parent(fengmei, wei).
93 parent(fengmei, tim).
94 %----- Level 3-4 -----
95 parent(qirong, james).
96 parent(qirong, jiangpiang).
97 parent(qirong, yiping).
98 parent(miaoyun, james).
99 parent(miaoyun, jiangping).
.00 parent(miaoyun, yiping).
.01 parent(wei, siyuan).
.02 parent(wei, sijin).
.03 parent(hongyi, siyuan).
.04 parent(hongyi, sijin).
.05 parent(tim, hua).
.06 parent(anna, hua).
.07 %----- Level 4-5 -----
.08 parent(marry, alina).
.09 parent(jiangping, alina).
.10 parent(yiping, chengcheng).
.11 parent(siyuan, chengcheng).
.12 parent(sijin, tom).
.13 parent(manqi, tom).
.14 %----- Level 5-6 -----
.15 parent(summer, jack).
.16 parent(chengcheng, jack).

```

Правила

```
119 % Child, Son, Daughter
120 child(Child, Parent) :-
121     parent(Parent, Child).
122
123 son(Son, Person) :-
124     child(Son, Person),
125     male(Son).
126
127 daughter(Daughter, Person) :-
128     child(Daughter, Person),
129     female(Daughter).
130
131 % Mother, Father, is parent
132 mother(Mother, Person) :-
133     parent(Mother, Person),
134     female(Mother).
135
136 father(Father, Person) :-
137     parent(Father, Person),
138     male(Father).
139
140 isparent(Person) :-
141     parent(Person, _).
142
143 % Sibling, sister, brother
144 sibling(Sibling, Person) :-
145     parent(Parent, Person),
146     parent(Parent, Sibling),
147     % Make sure you are not your sibling :)
148     Sibling \== Person.
149
150 sister(Sister, Person) :-
151     sibling(Sister, Person),
152     female(Sister).
153
154 brother(Person, Brother) :-
155     sibling(Person, Brother),
156     male(Brother).
157
158
159 % Uncle, Aunt
160 uncle_or_aunt(Uncle_or_aunt, Person) :-
161     parent(Parent, Person),
162     sibling(Uncle_or_aunt, Parent).
163
164 uncle(Uncle, Person) :-
165     uncle_or_aunt(Uncle, Person),
166     male(Uncle).
167
168 aunt(Aunt, Person) :-
169     uncle_or_aunt(Aunt, Person),
170     female(Aunt).
171
172 % Grandparent, Grandfather, Grandmother,
173 % greatgrandmother, greatgrandfather, grandchild,
174 % granddaughter, grandson
175 grandparent(GrandParent, Person) :-
176     parent(Parent, Person),
177     parent(GrandParent, Parent).
```

```

179 grandfather(Grandfather, Person) :-
180     grandparent(Grandfather, Person),
181     male(Grandfather).
182
183 grandmother(Grandmother, Person) :-
184     grandparent(Grandmother, Person),
185     female(Grandmother).
186
187 greatgrandmother(Greatgrandmother, Person) :-
188     grandparent(Grandmother, Person),
189     mother(Greatgrandmother, Grandmother).
190
191 greatgrandfather(Greatgrandfather, Person) :-
192     grandparent(Grandfather, Person),
193     mother(Greatgrandfather, Grandfather).
194
195 grandchild(Grandchild, Person) :-
196     parent(Person, Child),
197     parent(Child, Grandchild).
198
199 granddaughter(Granddaughter, Person) :-
200     grandchild(Granddaughter, Person),
201     female(Granddaughter).
202
203 grandson(Grandson, Person) :-
204     grandchild(Grandson, Person),
205     male(Grandson).
206
207 % Cousin
208 cousin(Cousin, Person) :-
209     uncle_or_aunt(Uncle_or_aunt, Person),
210     child(Cousin, Uncle_or_aunt).
211
212 % Parent in law, father in law, mother in law.
213 % Your wife or husband 's parents.
214 parent_in_law(Pil, Person) :-
215     couple(Hus_Wife, Person),
216     parent(Pil, Hus_Wife).
217
218 father_in_law(Fil, Person) :-
219     parent_in_law(Fil, Person),
220     male(Fil).
221
222 mother_in_law(Mil, Person) :-
223     parent_in_law(Mil, Person),
224     female(Mil).

```

Примеры выполнения запросов

1. Who is Siyuan's kid?



child(X,siyuan).

X = chengcheng

2. Who is Siyuan's father?



father(X,siyuan).

X = wei

3. Does Siyuan have child? If yes, who is him/she?



isparent(siyuan).

true



parent(siyuan,X).

X = chengcheng

4. Who is Siyuan's brother?



brother(X,siyuan).

X = sijin

5. Who are Siyuan's uncle?



uncle(X,siyuan).

X = tim