## Код программы

domains

city, street = string.

house, flat = integer.

adress = adr(city, street, house, flat)

surname, tel = string.

university = string.

brand, color = string.

price = integer.

bank, account = string.

amount = integer.

predicates

student\_tel(surname, tel)

university(surname, university)

un\_sprav(university, tel)

student\_adress(surname, adress)

tel\_sprav(surname, tel, adress)

car(surname, brand, color, price)

bank\_depositor(surname, bank, account, amount)

car\_by\_tel(tel, surname, brand, price)

brand\_by\_tel(tel, brand)

person\_by\_city(surname, city, street, bank, tel)

person\_by\_car(brand, color, surname, city, tel, bank)

clauses

student\_tel("Pronin", "89167376051").

student\_tel("Pronin", "89167376052").

student\_tel("Lisnevsky", "89167376053").

student\_tel("Lisnevsky", "89167376054").

student\_tel("Klimov", "89167376055").

student\_tel("Klimov", "89167376056").

student\_tel("Alahov", "89167376057").

student\_tel("Alahov", "89167376058").

student\_tel("Trunov", "89167376050").

student\_tel("Trunov", "89167376059").

university("Pronin", "BMSTU").

university("Trunov", "BMSTU").

university("Klimov", "HSE").

university("Lisnevsky", "MIRAEA").

university("Alahov", "MIPT").

un\_sprav(U, T):-student\_tel(S, T),university(S, U).

student\_adress("Pronin", adr("Moscow", "Tverskaya", 1, 1)).

student\_adress("Lisnevsky", adr("Moscow", "Tverskaya", 1, 2)).

student\_adress("Klimov", adr("Moscow", "Tverskaya", 1, 3)).

student\_adress("Alahov", adr("Moscow", "Tverskaya", 1, 4)).

student\_adress("Trunov", adr("Moscow", "Tverskaya", 1, 5)).

tel\_sprav(S, T, A):-student\_tel(S, T),student\_adress(S, A).

car("Pronin", "Audi", "Black", 2000000).

car("Pronin", "BMW", "White", 2000000).

car("Pronin", "Ford", "Gray", 2000000).

car("Lisnevsky", "BMW", "Green", 3000000).

car("Klimov", "Ford", "Blue", 4000000).

car("Alahov", "BMW", "Red", 5000000).

car("Trunov", "Audi", "Violet", 7000000).

car("Pronin", "Audi", "Violet", 7000000).

bank\_depositor("Pronin", "SberBank", "40817810099910004312", 7000000).

bank\_depositor("Lisnevsky", "SberBank", "40817810099910004313", 4000000).

bank\_depositor("Klimov", "VTB", "40817810099910004314", 5000000).

bank\_depositor("Alahov", "VTB", "40817810099910004315", 6000000).

bank\_depositor("Trunov", "RosBank", "40817810099910004316", 7000000).

bank\_depositor("Trunov", "SberBank", "40817810099910004317", 7000000).

bank\_depositor("Trunov", "VTB", "40817810099910004318", 7000000).

car\_by\_tel(T, S, B, P):-student\_tel(S, T),car(S, B, \_, P).

brand\_by\_tel(T, B):-car\_by\_tel(T, \_, B, \_).

person\_by\_city(S, C, St, B, T):-tel\_sprav(S, T, adr(C, St, \_, \_)),

bank\_depositor(S, B, \_, \_).

person\_by\_car(Br, Col, S, City, T, Bank):-car(S, Br, Col, \_),

tel\_sprav(S, T, adr(City, \_, \_, \_)),

bank\_depositor(S, Bank, \_, \_).

goal

%PART 1

%tel\_sprav("Pronin", "89167376051", adr("Moscow", "Tverskaya", 1, 1)).

%tel\_sprav(X, Y, adr("Moscow", "Tverskaya", 1, Z)).

%car("Pronin", X, Y, Z).

%bank\_depositor("Trunov", X, Y, Z).

%car\_by\_tel("89167376051", X, Y, Z). %1a

%brand\_by\_tel("89167376051", X). %1b

%person\_by\_city("Pronin", "Moscow", X, Y, Z). %2

%PART 2

%person\_by\_car("Audi", "Violet", Surname, City, Telephone, Bank). %several owners

%person\_by\_car("Audi", "Black", Surname, City, Telephone, Bank). %one owner

person\_by\_car("Audi", "Green", Surname, City, Telephone, Bank). %no owners

## Задание 1

Для каждого из трех вариантов словесно подробно описать порядок формирования ответа (в виде таблицы). При у казать отметить моменты очередного запуска алгоритма унификации и полный результат его работы. Обосновать следующий шаг работы системы. Выписать унификаторы подстановки. Указать моменты, причины и результат отката, если он есть.

## Задание 3

Оформите 2 таблицы, демонстрирующие порядок работы алгоритма унификации вопроса и подходящего заголовка правила (для двух случаев из пункта 2) и укажите резултаты его работы: ответ и побочный эффект.

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| person\_by\_car("Audi", "Violet", Surname, City, Telephone, Bank) | person\_by\_car(Br, Col, S, City, T, Bank) |
| car(S, "Audi", " Violet ", \_) | car("Trunov", "Audi", "Violet", 7000000) |
| tel\_sprav(S, T, adr(City, \_, \_, \_)) | tel\_sprav(S, T, A) |
| student\_tel(S, T) | student\_tel("Trunov", "89167376050") |
| student\_adress(S, A) | student\_adress("Trunov", adr("Moscow", "Tverskaya", 1, 5)) |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Trunov", "RosBank", "40817810099910004316", 7000000) |

Запомнить ответ с (Surname = "Trunov" City = "Moscow" Telephone = "89167376050" Bank = "RosBank")  
Откат переменной Bank

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Trunov", "SberBank", "40817810099910004317", 7000000) |

Запомнить ответ с (Surname = "Trunov" City = "Moscow" Telephone = "89167376050" Bank = "SberBank")  
Откат переменной Bank

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Trunov", "VTB", "40817810099910004318", 7000000) |

Запомнить ответ с (Surname = "Trunov" City = "Moscow" Telephone = "89167376050" Bank = "VTB")  
Откат переменной Bank, City и Telephone

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| student\_tel(S, T) | student\_tel("Trunov", "89167376059") |
| student\_adress(S, A) | student\_adress("Trunov", adr("Moscow", "Tverskaya", 1, 5)) |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Trunov", "RosBank", "40817810099910004316", 7000000) |

Запомнить ответ с (Surname = "Trunov" City = "Moscow" Telephone = "89167376059" Bank = " RosBank ")  
Откат переменной Bank

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Trunov", "SberBank", "40817810099910004317", 7000000) |

Запомнить ответ4 с (Surname = "Trunov" City = "Moscow" Telephone = "89167376059" Bank = "SberBank")  
Откат переменной Bank

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Trunov", "VTB", "40817810099910004318", 7000000) |

Запомнить ответ5 с (Surname = "Trunov" City = "Moscow" Telephone = "89167376059" Bank = "VTB")  
Откат переменной Bank, City, Telephone и Surname

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| car(S, "Audi", " Violet ", \_) | car("Pronin", "Audi", "Violet", 7000000) |
| tel\_sprav(S, T, adr(City, \_, \_, \_)) | tel\_sprav(S, T, A) |
| student\_tel(S, T) | student\_tel("Pronin", "89167376051") |
| student\_adress(S, A) | student\_adress("Pronin", adr("Moscow", "Tverskaya", 1, 1)) |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Pronin", "SberBank", "40817810099910004312", 7000000) |

Запомнить ответ6 с (Surname = "Pronin" City = "Moscow" Telephone = "89167376051" Bank = "SberBank")  
Откат переменной Bank, City и Telephone

|  |  |
| --- | --- |
| **Терм 1** | **Терм 2** |
| student\_tel(S, T) | student\_tel("Pronin", "89167376052") |
| student\_adress(S, A) | student\_adress("Pronin", adr("Moscow", "Tverskaya", 1, 1)) |
| bank\_depositor(S, Bank, \_, \_) | bank\_depositor("Pronin", "SberBank", "40817810099910004312", 7000000). |

Запомнить ответ с (Surname = "Pronin" City = "Moscow" Telephone = "89167376052" Bank = "SberBank")

Итого:

Surname=Trunov, City=Moscow, Telephone=89167376050, Bank=RosBank

Surname=Trunov, City=Moscow, Telephone=89167376050, Bank=SberBank

Surname=Trunov, City=Moscow, Telephone=89167376050, Bank=VTB

Surname=Trunov, City=Moscow, Telephone=89167376059, Bank=RosBank

Surname=Trunov, City=Moscow, Telephone=89167376059, Bank=SberBank

Surname=Trunov, City=Moscow, Telephone=89167376059, Bank=VTB

Surname=Pronin, City=Moscow, Telephone=89167376051, Bank=SberBank

Surname=Pronin, City=Moscow, Telephone=89167376052, Bank=SberBank

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person\_by\_car("Audi", "Violet", Surname, City, Telephone, Bank). (До первого ответа)

|  |  |
| --- | --- |
| Стек вызова | лок. перемнные |
| person\_by\_car("Audi", "Violet", Surname, City, Telephone, Bank) | Surname = ?  City = ?  Telephone = ?  Bank = ? |
| person\_by\_car(Br, Col, S, City, T, Bank) | Br = "Audi"  Col = "Violet"  S = ?  City = ?  T = ?  Bank = ? |
| car(S, "Audi", "Violet", \_)  person\_by\_car("Audi", "Violet", S, City, T, Bank) | S = “Trunov”  Br = "Audi"  Col="Violet" |
| person\_by\_car("Audi", "Violet", S, City, T, Bank) | Br = "Audi"  Col="Violet"  S = “Trunov”  City = ?  T = ?  Bank = ? |
| tel\_sprav(S, T, adr(City, \_, \_, \_))  person\_by\_car("Audi", "Violet", S, City, T, Bank) | S = "Trunov"  T = ?  City = ? |
| student\_tel(S, T)  tel\_sprav(S, T, adr(City, \_, \_, \_))  person\_by\_car("Audi", "Violet", S, City, T, Bank) | S = “Trunov” T = “89167376050” |
| student\_adress(S, adr(City, \_, \_, \_))  tel\_sprav(S, T, adr(City, \_, \_, \_))  person\_by\_car("Audi", "Violet", S, City, T, Bank) | S = “Trunov”  City = “Moscow” |
| person\_by\_car("Audi", "Violet", S, City, T, Bank) | Br = "Audi"  Col="Violet"  S = “Trunov”  City = “Moscow”  T = “89167376050”  Bank = ? |
| bank\_depositor(S, Bank, \_, \_)  person\_by\_car("Audi", "Violet", S, City, T, Bank) | S = “Trunov”  Bank = “RosBank” |
| person\_by\_car("Audi", "Violet", S, City, T, Bank) | Br = "Audi"  Col="Violet"  S = “Trunov”  City = “Moscow”  T = “89167376050”  Bank = “RosBank” |

Запомнить ответ с (Surname = "Trunov" City = "Moscow" Telephone = "89167376050" Bank = "RosBank")

Откат переменной Bank

Фигня:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Терм 1 | Терм 2 | Униф. | стек вызова | стек лок. пер. |
| person\_by\_car( "Audi", "Black", Surname, City, Telephone, Bank) | Всё что до person\_by\_car | Нет | person\_by\_car("Audi", "Black", \_, \_, \_, \_) | Br = "Audi"  Col="Violet"  S = \_  City = \_  T = \_  Bank = \_ |
| person\_by\_car( "Audi", "Black", Surname, City, Telephone, Bank) | person\_by\_car( Br, Col, S, City, T, Bank):- car(S, Br, Col, \_),  tel\_sprav(S, T, adr(City, \_, \_, \_)),  bank\_depositor(S, Bank, \_, \_). | Да |  |  |