Министерство образования Республики Беларусь

Учреждение образования

БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
ИНФОРМАТИКИ И РАДИОЭЛЕКТРОНИКИ

Факультет информационный технологий и управления

Кафедра интеллектуальных информационных технологий

Дисциплина: «Математические основы интеллектуальных систем»

Лабораторная работа №3 по теме:
«Конвертация результатов лабораторных работ 1-3 в SCs»

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Тема

Конвертация результатов лабораторных работ 1-3 в SCs

Цель

Получить навыки формального представления в базе знаний высказываний на языках SCs и SCn.

Задание

Индивидуальные задания из л.р. 1-2 представить при помощи языка SCs, для результатов л.р. 3 заменить идентификаторы на системные. Результаты л.р. 1-3 собрать в базу и продемонстрировать работу системы.

Выполнение задания

1. Конвертация л.р. 1

```
treugolnik <- sc_node_class;;
ravnobedrenniy_treugolnik <- sc_node_class;;
otrezok <- sc_node_class;;
ploschad <- sc_node_class;;
chislo <- sc_node_class;;
okrujnost <- sc_node_class;;
dlina <- sc_node_class;;
tochnaya_velichina <- sc_node_class;;
..node1 <- sc_node_class;;
..node2 <- sc_node_class;;
..node3 <- sc_node_class;;
..tuple <- sc_node_tuple;;

treugolnik => nrel_vkluchenie:ravnobedrenniy_treugolnik(* -> TreugolnikABC;;*);;
treugolnik -> TreugolnikBDC;;
TreugolnikBDC => nrel_storona:DC;BC;BD;;
otrezok -> BC;AC;BD;DC;AB;;
tochnaya_velichina -> ..node1;;
dlina -> ..node1;;
..node1 -> BC;AB;;
TreugolnikABC => nrel_bokovaya_storona:AB;BC;;
..node1 => nrel_izmereniye:6 (* <- chislo;; *);;
..node1 <- tochnaya_velichina;;
..node1 <- dlina;;
TreugolnikBDC => nrel_storona:DC;BC;;
ploschad -> ..node2;;
..node2 <- tochnaya_velichina;;
..node2 => rrel_izmereniye: S;;
S <- chislo;;
chislo -> 1;;
..node3 => rrel_izmereniye : 1;;
dlina -> ..node3;;
..node3 <- tochnaya_velichina;;
..node3 -> ..node4;;
okrujnost -> ..node5(* => nrel_radius: ..node4;;*);;
..node5 => rrel_byt_vpisannim: TreugolnikBDC;;
..tuple -> AC;BD;;
..tuple => rrel_peresecheniye : ..dot(* -> D;; *);;
TreugolnikABC => rrel_osnovanie: AC;;
..node2 <- ploschad;;
..node2 <- tochnaya_velichina;;
..node2 -> TreugolnikABC;;
BD => rrel_visota: TreugolnikABC;;
TreugolnikABC => rrel_osnovanie: AC;;
```

2. Конвертация л.р. 2

```
english_language <- sc_node_class;;
russian_language <- sc_node_class;;

facility <- sc_node_class;;

facility => nrel_main_identificator: ["facility"];;
facility => nrel_main_identificator: ["predpriyatie"];;
english_language -> ["facility"];;
russian_language -> ["predpriyatie"];;
facility => nrel_system_identificator: ["concept_facility"];;

..tuple1 <- sc_node_tuple;;
sc_definition <- sc_node_class;;
complex <- sc_node_class;;
activity <- sc_node_class;;

sc_definition -> ..node1(* => nrel_main_identificator: ["Def.Facility"];; *);;
..node1 => nrel_used_constants: ..tuple1(* -> complex; activity;; *);;
..node2 => rrel_sc_text_translation: ..node1;;
..node2 -> rrel_example: ["Facility - a property complex used for entrepreneurial activities"];;
english_language -> ["Facility - a property complex used for entrepreneurial activities"];["Def.Facility"];;
..node1 -> rrel_sc_key_element: facility;;


..tuple2 <- sc_node_tuple;;
sc_statement <- sc_node_class;;
balance <- sc_node_class;;
bank <- sc_node_class;;
account <- sc_node_class;;
stamp <- sc_node_class;;
nomination <- sc_node_role_relation;;

sc_definition -> ..node1(* => nrel_main_identificator: ["St.Facility"];; *);;
..node3 => nrel_used_constants: ..tuple2(* -> balance; bank; account; stamp; nomination;; *);;
..node4 => rrel_sc_text_translation: ..node1;;
..node4 -> rrel_example: ["The_facility has an independent balance account, settlement and other accounts in banks, a stamp with its nomination"];;
english_language -> ["The facility has an independent balance account, settlement and other accounts in banks, a stamp with its nomination"];["St.Facility"];;
..node3 -> rrel_sc_key_element: facility;;


property_complex <- sc_node_class;;

property_complex => nrel_include: facility;;


facility -> roga_i_kopyta(* => nrel_manufacturing_department: paintintg_department; assembly_department; probation_department;; *);;
```

```
chief <- sc_node_norole_relation;;

chief => nrel_main_identificator: ["chief"];;
chief => nrel_identificator: ["boss"];;
chief => nrel_main_identificator: ["nachalnik"];;
chief => nrel_identificator: ["rukovoditel"];;
english_language -> ["chief"];;
russian_language -> ["nachalnik"];;
english_language -> ["boss"];;
russian_language -> ["rukovoditel"];;
chief => nrel_system_identificator: ["nrel_chief"];;


..tuple3 <- sc_node_tuple;;
official <- sc_node_class;;
power <- sc_node_class;;
subordinate <- sc_node_norole_relation;;

sc_definition -> ..node5(* => nrel_main_identificator: ["Def.Chief"];; *);;
..node5 => nrel_used_constants: ..tuple1(* -> complex; activity;; *);;
..node6 => rrel_sc_text_translation: ..node1;;
..node6 -> rrel_example: ["Chief - an official who has subordinates and wields power"];;
english_language -> ["Chief - an official who has subordinates and wields power"];["Def.Chief"];;
..node5 -> rrel_sc_key_element: chief;;


..tuple4 <- sc_node_tuple;;
employee <- sc_node_norole_relation;;
need <- sc_node_norole_relation;;

sc_statement -> ..node5(* => nrel_main_identificator: ["St.Chief"];; *);;
..node7 => nrel_used_constants: ..tuple4(* -> complex; activity;; *);;
..node8 => rrel_sc_text_translation: ..node1;;
..node8 -> rrel_example: ["A good boss understands the needs of his employees"];;
english_language -> ["A good boss understands the needs of his employees"];["St.Chief"];;
..node7 -> rrel_sc_key_element: chief;;


..node9 <- sc_node_class;;
arity <- sc_node_class;;
number <- sc_node_class;;

arity -> ..node9 (* => nrel_measuring: 2;; *);;
..node9 -> chief;;
number -> 2;;
```

```
relation <- sc_node_class;;
binary_relation <- sc_node_class;;
symmetrical_relation <- sc_node_class;;
reflexive_relation <- sc_node_class;;
transitive_relation <- sc_node_class;;
oriented_relation <- sc_node_class;;

relation => nrel_include: oriented_relation; binary_relation(* => nrel_include: symmetrical_relation; reflexive_relation; oriented_relation;; *);;
symmetrical_relation -|> chief;;
reflexive_relation -|> chief;;
transitive_relation -|> chief;;
oriented_relation -> chief;;


human <- sc_node_class;;

human -> Vasiliy_Ivanovich;;
facility -> roga_i_kopyta(* => chief: Vasiliy_Ivanovich;; *);;


manufacturing <- sc_node_class;;
..tuple5 <- sc_node_tuple;;

chief => nrel_second_domain: human;;
chief => nrel_first_domain: manufacturing;;
chief => nrel_definition_domain: ..node10;;
..tuple5 => ..node10;;
..tuple5 -> human;;
..tuple5 -> manufacturing;;
```

3. Конвертация л.р. 3

```
..tuple1 <- sc_node_tuple;;
..tuple2 <- sc_node_tuple;;
..tuple3 <- sc_node_tuple;;
human <- sc_node_class;;
facility <- sc_node_class;;

nrel_generality -> ..tuple1;;
..tuple1 -> rrel_linked_variables: {_x; _y};;
..tuple1 -> ..tuple2;;
nrel_implication -> ..tuple2;;
..tuple2 -> rrel_if: [* human _-> _x;; facility _-> _y;; *];;
..tuple2 -> rrel_then: ..tuple3;;
nrel_equivalent -> ..tuple3;;
..tuple3 -> [*_x _=> rrel_responsible_for: _y;;*];;
..tuple3 -> [*_y _=> rrel_chief: _x;;*];;


..tuple4 <- sc_node_tuple;;
..tuple5 <- sc_node_tuple;;
facility <- sc_node_class;;
bad <- sc_node_class;;

nrel_existence -> ..tuple4;;
..tuple4 -> rrel_linked_variables: {_z};;
..tuple4 -> ..tuple5;;
nrel_implication -> ..tuple5;;
..tuple5 -> rrel_if: [* facility _-> _z;; bad _-> _z;; *];;
..tuple5 -> rrel_then: [*_z _=> rrel_liquidate: _z;;*];;

```

Вывод

В результате лабораторной работы были получены практические навыки формального представления в базе высказываний на языке SCs. Помимо этого, были получены навыки работы с языком SCn. Также были получены навыки, связанные с работой на платформе OSTIS.