KAUNO TECHNOLOGIJOS UNIVERSITETAS

INFORMATIKOS FAKULTETAS

INTELEKTIKOS PAGRINDAI 2019

Laboratorinio darbo ataskaita

Darbą atliko:

IFF-6/6 gr. studentas

Ignas Jasonas

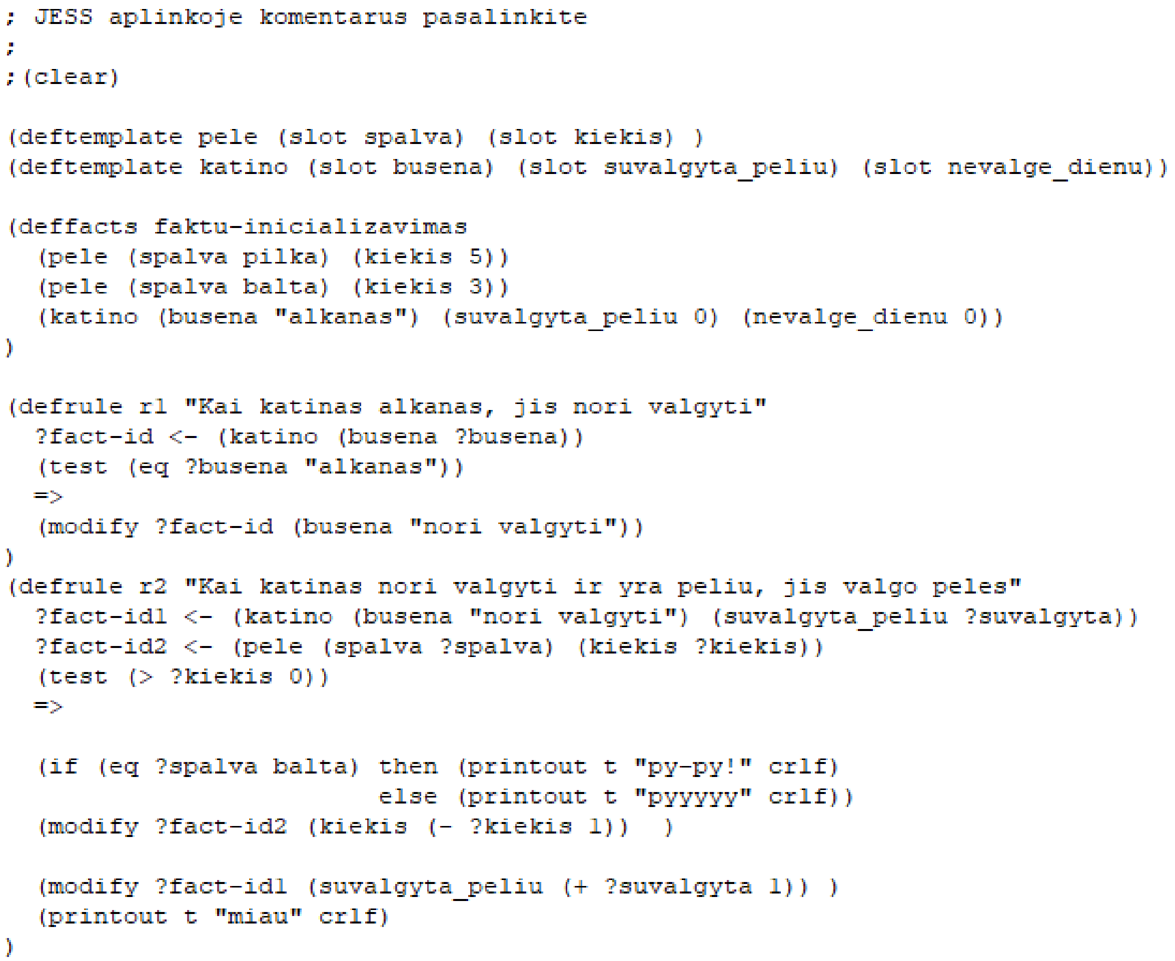
Priėmė:

Dėstytojas Germanas Budnikas

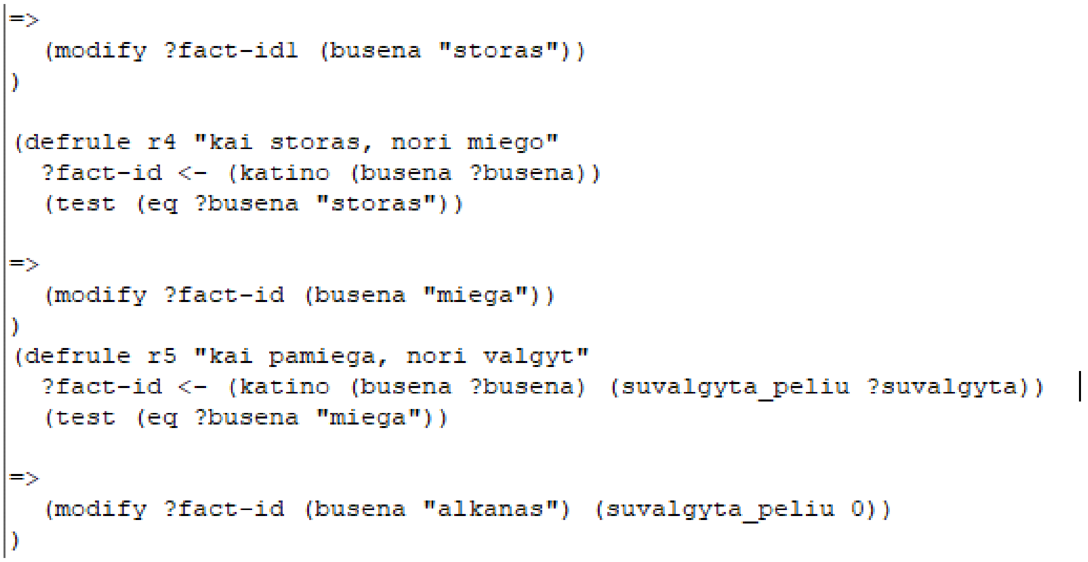
KAUNAS 2019

1. Laboratorinis darbas 1

1.1.Kodas

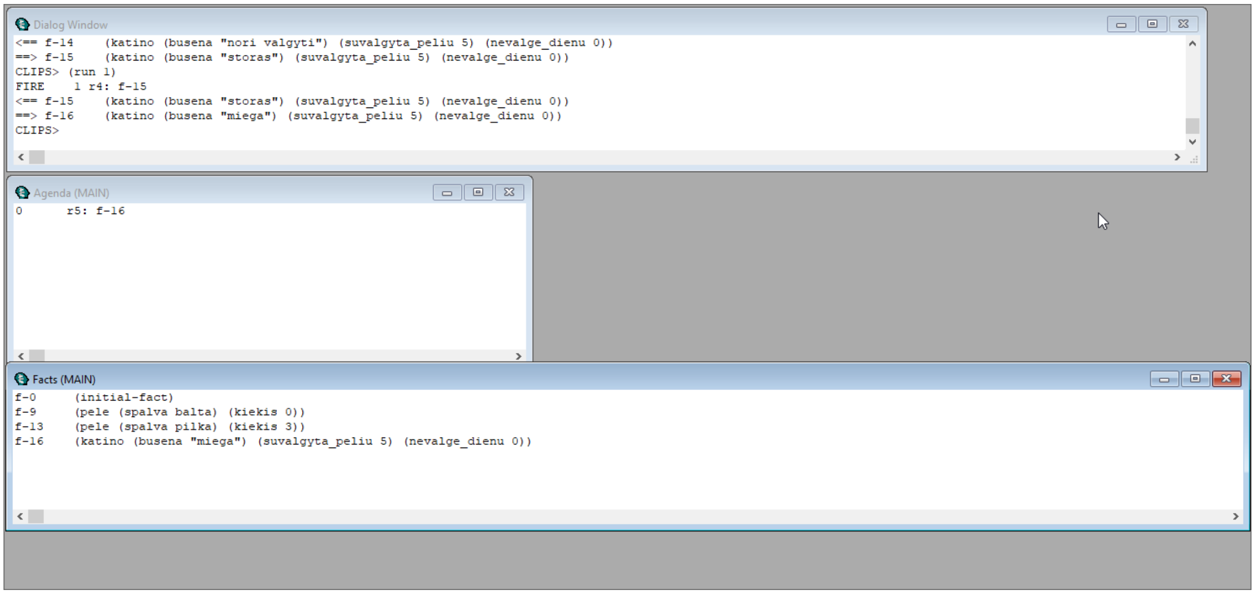


```
; JESS aplinkoje komentarus pasalinkite
;
;(clear)

(deftemplate pele (slot spalva) (slot kiekis) )
(deftemplate katino (slot busena) (slot suvalgyta_peliu) (slot nevalge_dienu))

(deffacts faktu-inicializavimas
  (pele (spalva pilka) (kiekis 5))
  (pele (spalva balta) (kiekis 3))
  (katino (busena "alkanas") (suvalgyta_peliu 0) (nevalge_dienu 0))
)

(defrule r1 "Kai katinas alkanas, jis nori valgyti"
  ?fact-id <- (katino (busena ?busena))
  (test (eq ?busena "alkanas"))
  =>
  (modify ?fact-id (busena "nori valgyti"))
)
(defrule r2 "Kai katinas nori valgyti ir yra peliu, jis valgo peles"
  ?fact-id1 <- (katino (busena "nori valgyti") (suvalgyta_peliu ?suvalgyta))
  ?fact-id2 <- (pele (spalva ?spalva) (kiekis ?kiekis))
  (test (> ?kiekis 0))
  =>

  (if (eq ?spalva balta) then (printout t "py-py!" crlf)
                         else (printout t "pyyyyy" crlf))
  (modify ?fact-id2 (kiekis (- ?kiekis 1))  )

  (modify ?fact-id1 (suvalgyta_peliu (+ ?suvalgyta 1)) )
  (printout t "miau" crlf)
)

(defrule r3 "kai katinas suvalgo 5 peles, jis tampa storu katinu"
  (declare (salience 10))
  ?fact-id1 <- (katino (busena "nori valgyti") (suvalgyta_peliu ?suvalgyta))
  (test (= ?suvalgyta 5))
```



```
=>
  (modify ?fact-id1 (busena "storas"))
)

(defrule r4 "kai storas, nori miego"
  ?fact-id <- (katino (busena ?busena))
  (test (eq ?busena "storas"))

=>
  (modify ?fact-id (busena "miega"))
)
(defrule r5 "kai pamiega, nori valgyt"
  ?fact-id <- (katino (busena ?busena) (suvalgyta_peliu ?suvalgyta))
  (test (eq ?busena "miega"))

=>
  (modify ?fact-id (busena "alkanas") (suvalgyta_peliu 0))
)
```

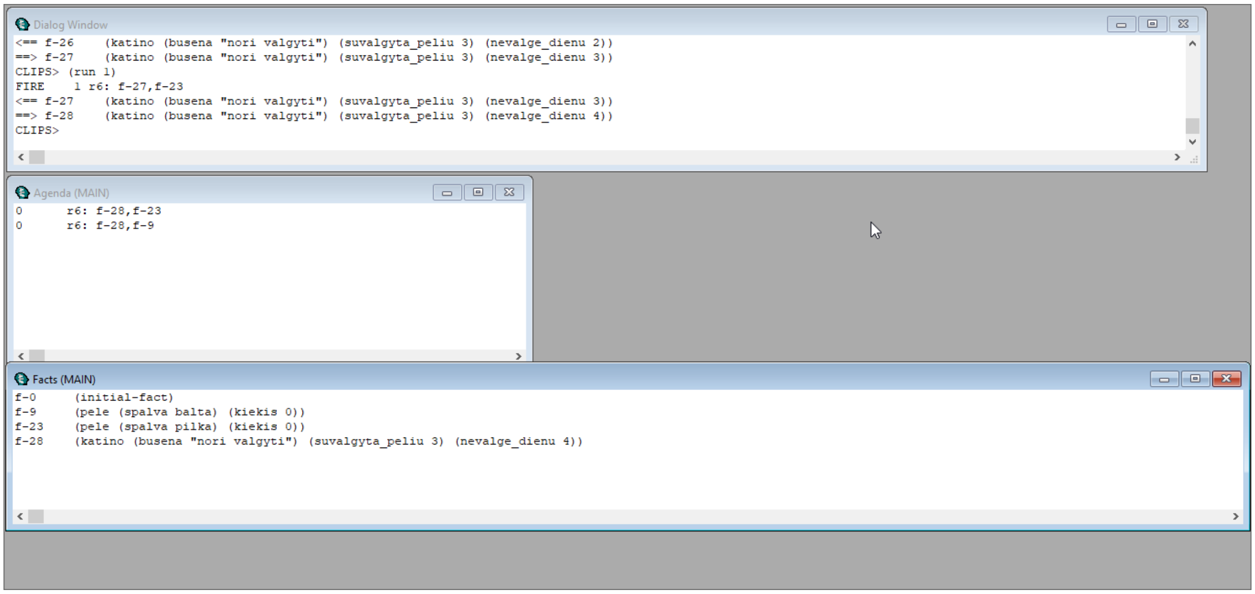
1.2.Rezultatai



```
<== f-14    (katino (busena "nori valgyti") (suvalgyta_peliu 5) (nevalge_dienu 0))
==> f-15    (katino (busena "storas") (suvalgyta_peliu 5) (nevalge_dienu 0))
CLIPS> (run 1)
FIRE    1 r4: f-15
<== f-15    (katino (busena "storas") (suvalgyta_peliu 5) (nevalge_dienu 0))
==> f-16    (katino (busena "miega") (suvalgyta_peliu 5) (nevalge_dienu 0))
CLIPS>
```

```
0      r5: f-16
```

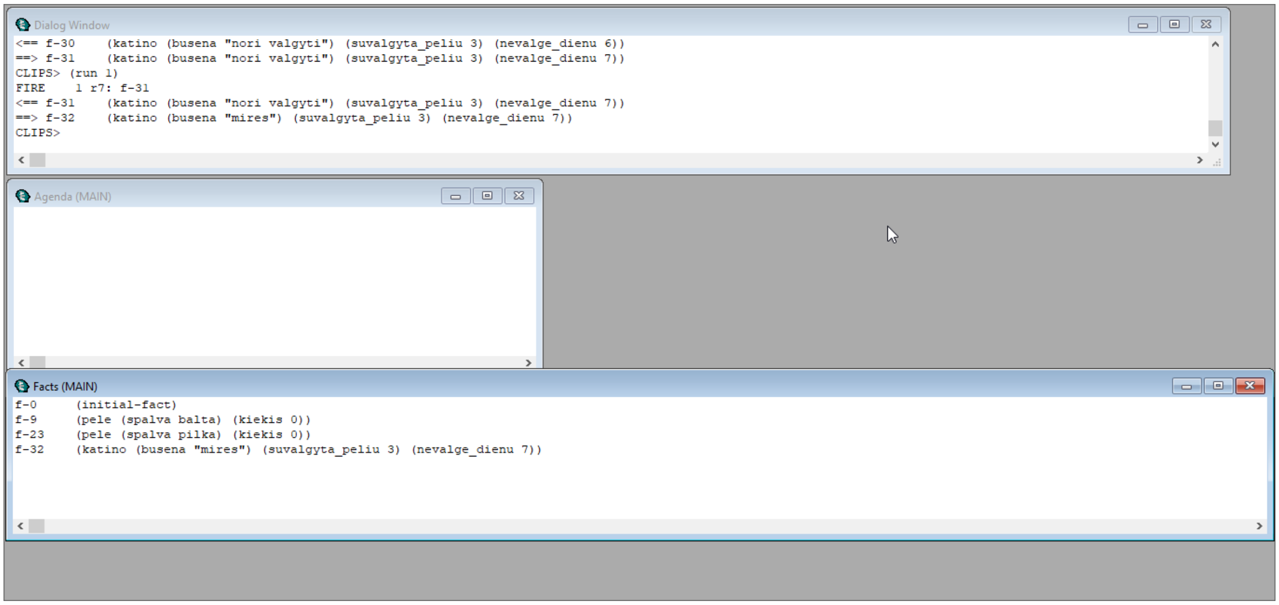
```
f-0     (initial-fact)
f-9     (pele (spalva balta) (kiekis 0))
f-13    (pele (spalva pilka) (kiekis 3))
f-16    (katino (busena "miega") (suvalgyta_peliu 5) (nevalge_dienu 0))
```



```
<== f-26    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 2))
==> f-27    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 3))
CLIPS> (run 1)
FIRE    1 r6: f-27,f-23
<== f-27    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 3))
==> f-28    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 4))
CLIPS>
```

```
0      r6: f-28,f-23
0      r6: f-28,f-9
```

```
f-0     (initial-fact)
f-9     (pele (spalva balta) (kiekis 0))
f-23    (pele (spalva pilka) (kiekis 0))
f-28    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 4))
```

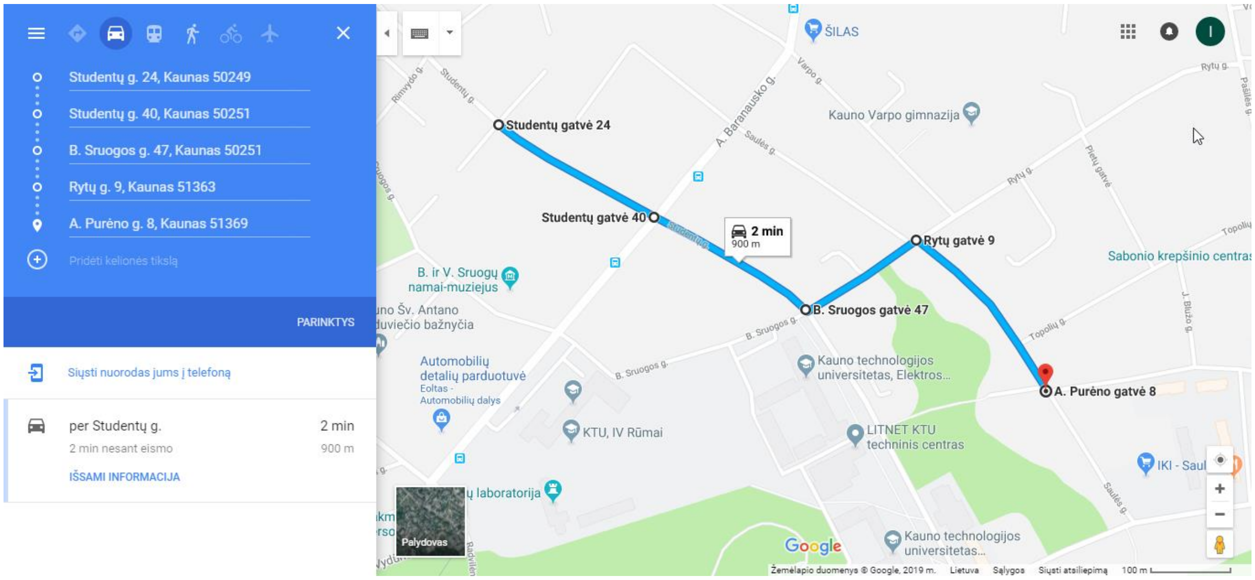


```
<== f-30    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 6))
==> f-31    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 7))
CLIPS> (run 1)
FIRE    1 r7: f-31
<== f-31    (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 7))
==> f-32    (katino (busena "mires") (suvalgyta_peliu 3) (nevalge_dienu 7))
CLIPS>
```

```
f-0     (initial-fact)
f-9     (pele (spalva balta) (kiekis 0))
f-23    (pele (spalva pilka) (kiekis 0))
f-32    (katino (busena "mires") (suvalgyta_peliu 3) (nevalge_dienu 7))
```

2. Individuali užduotis

2.1.Maršrutas



Studentų g. 24, Kaunas 50249

Studentų g. 40, Kaunas 50251

B. Sruogos g. 47, Kaunas 50251

Rytų g. 9, Kaunas 51363

A. Purėno g. 8, Kaunas 51369

Pridėti kelionės tikslą

PARINKTYS

Siųsti nuorodas jums į telefoną

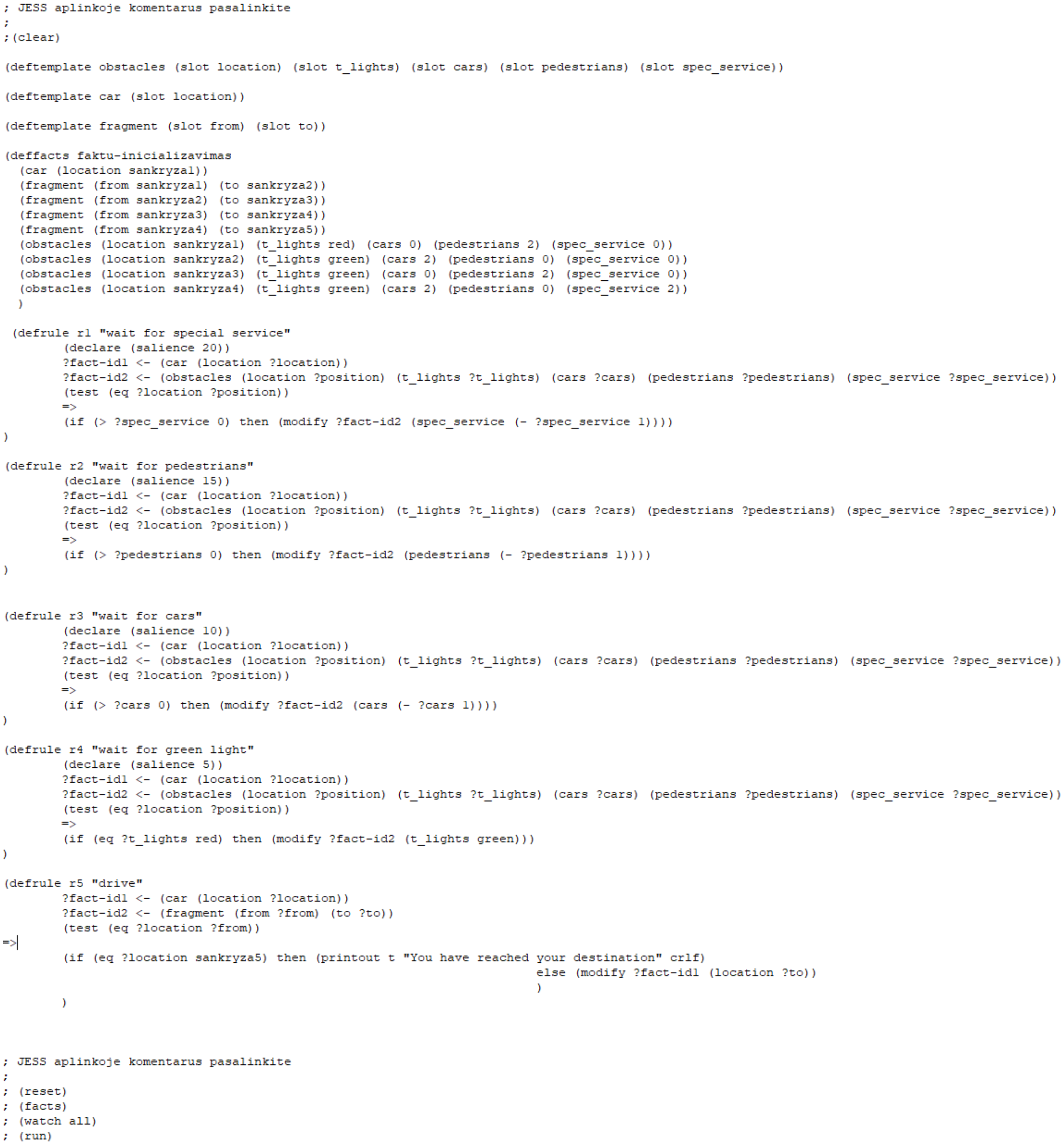
per Studentų g. 2 min

2 min nesant eismo 900 m

IŠSAMI INFORMACIJA

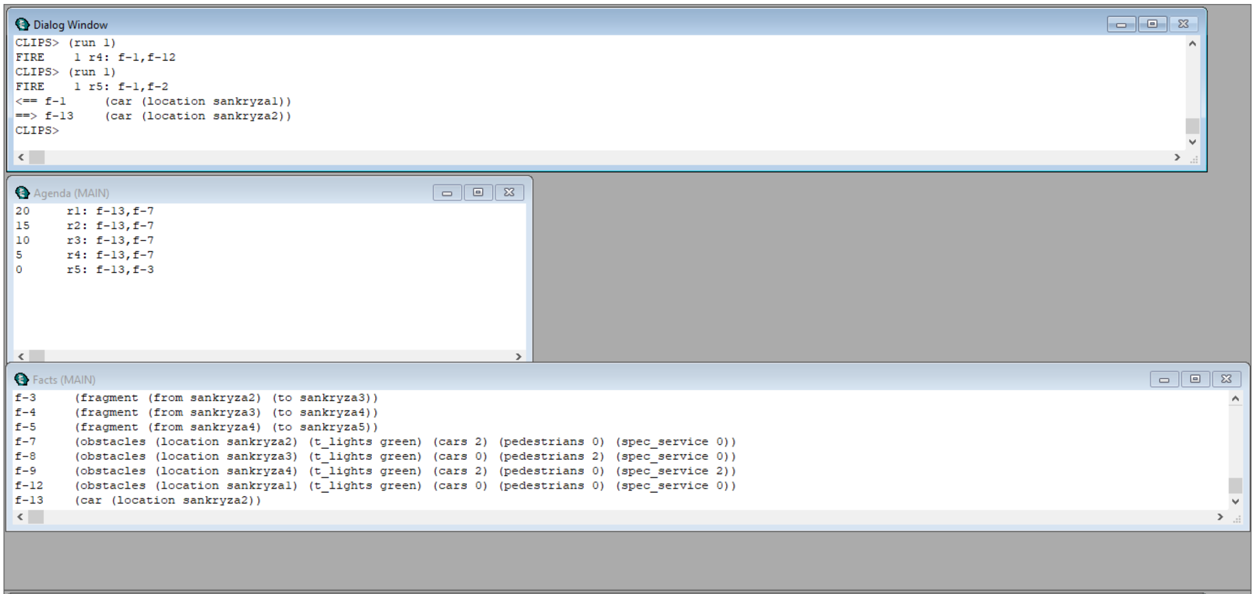
Studentų gatvė 24
Studentų gatvė 40
2 min
900 m
Rytų gatvė 9
B. Sruogos gatvė 47
A. Purėno gatvė 8
ŠILAS
Kauno Varpo gimnazija
Sabonio krepšinio centras
B. ir V. Sruogų namai-muziejus
Kauno technologijos universitetas, Elektros...
Automobilių detalių parduotuvė Eoltas - Automobilių dalys
KTU, IV Rūmai
LITNET KTU techninis centras
IKI - Saul
laboratorija
Kauno technologijos universitetas...
Palydovas
Google
Žemėlapio duomenys © Google, 2019 m. Lietuva Sąlygos Siųsti atsiliepimą 100 m
A. Baranausko g.
Varpo g.
Saulės g.
Rytų g.
Studentų g.
B. Sruogos g.
Topolių g.
Pietų gatvė
J. Biliūno g.

2.2.Kodas



```
; JESS aplinkoje komentarus pasalinkite
;
;(clear)

(deftemplate obstacles (slot location) (slot t_lights) (slot cars) (slot pedestrians) (slot spec_service))

(deftemplate car (slot location))

(deftemplate fragment (slot from) (slot to))

(deffacts faktu-inicializavimas
  (car (location sankryza1))
  (fragment (from sankryza1) (to sankryza2))
  (fragment (from sankryza2) (to sankryza3))
  (fragment (from sankryza3) (to sankryza4))
  (fragment (from sankryza4) (to sankryza5))
  (obstacles (location sankryza1) (t_lights red) (cars 0) (pedestrians 2) (spec_service 0))
  (obstacles (location sankryza2) (t_lights green) (cars 2) (pedestrians 0) (spec_service 0))
  (obstacles (location sankryza3) (t_lights green) (cars 0) (pedestrians 2) (spec_service 0))
  (obstacles (location sankryza4) (t_lights green) (cars 2) (pedestrians 0) (spec_service 2))
  )

 (defrule r1 "wait for special service"
        (declare (salience 20))
        ?fact-id1 <- (car (location ?location))
        ?fact-id2 <- (obstacles (location ?position) (t_lights ?t_lights) (cars ?cars) (pedestrians ?pedestrians) (spec_service ?spec_service))
        (test (eq ?location ?position))
        =>
        (if (> ?spec_service 0) then (modify ?fact-id2 (spec_service (- ?spec_service 1))))
)

(defrule r2 "wait for pedestrians"
        (declare (salience 15))
        ?fact-id1 <- (car (location ?location))
        ?fact-id2 <- (obstacles (location ?position) (t_lights ?t_lights) (cars ?cars) (pedestrians ?pedestrians) (spec_service ?spec_service))
        (test (eq ?location ?position))
        =>
        (if (> ?pedestrians 0) then (modify ?fact-id2 (pedestrians (- ?pedestrians 1))))
)


(defrule r3 "wait for cars"
        (declare (salience 10))
        ?fact-id1 <- (car (location ?location))
        ?fact-id2 <- (obstacles (location ?position) (t_lights ?t_lights) (cars ?cars) (pedestrians ?pedestrians) (spec_service ?spec_service))
        (test (eq ?location ?position))
        =>
        (if (> ?cars 0) then (modify ?fact-id2 (cars (- ?cars 1))))
)

(defrule r4 "wait for green light"
        (declare (salience 5))
        ?fact-id1 <- (car (location ?location))
        ?fact-id2 <- (obstacles (location ?position) (t_lights ?t_lights) (cars ?cars) (pedestrians ?pedestrians) (spec_service ?spec_service))
        (test (eq ?location ?position))
        =>
        (if (eq ?t_lights red) then (modify ?fact-id2 (t_lights green)))
)

(defrule r5 "drive"
        ?fact-id1 <- (car (location ?location))
        ?fact-id2 <- (fragment (from ?from) (to ?to))
        (test (eq ?location ?from))
=>
        (if (eq ?location sankryza5) then (printout t "You have reached your destination" crlf)
                                                                        else (modify ?fact-id1 (location ?to))
                                                                        )
        )


; JESS aplinkoje komentarus pasalinkite
;
; (reset)
; (facts)
; (watch all)
; (run)
```

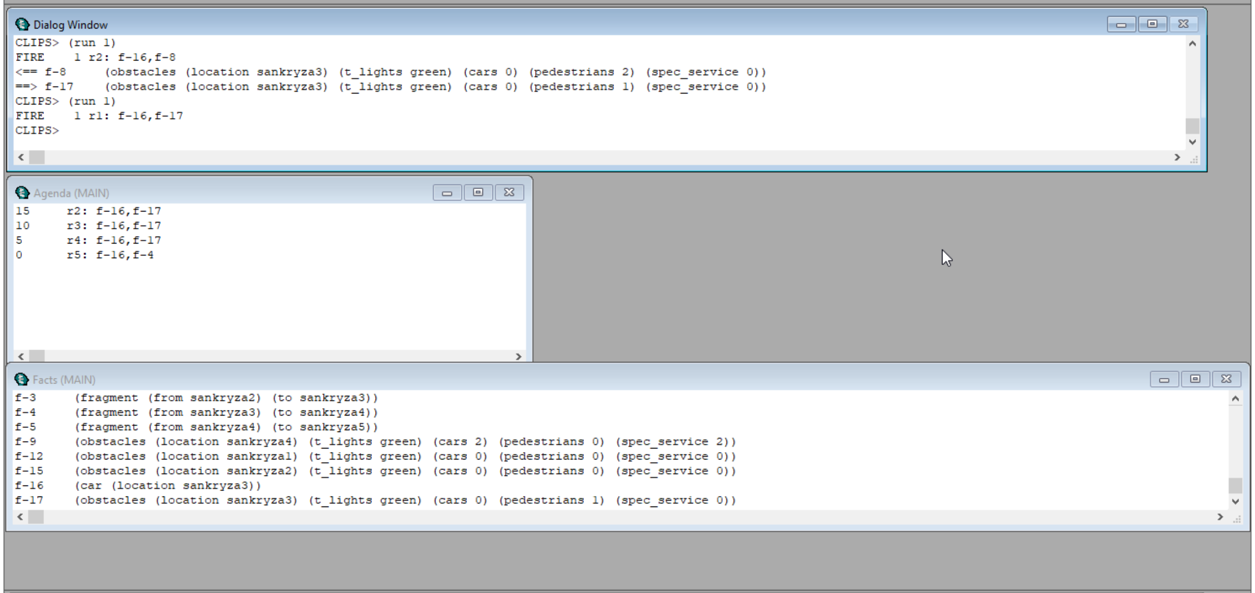
2.3.Rezultatai



```
CLIPS> (run 1)
FIRE    1 r4: f-1,f-12
CLIPS> (run 1)
FIRE    1 r5: f-1,f-2
<== f-1     (car (location sankryza1))
==> f-13    (car (location sankryza2))
CLIPS>
```

```
20      r1: f-13,f-7
15      r2: f-13,f-7
10      r3: f-13,f-7
5       r4: f-13,f-7
0       r5: f-13,f-3
```

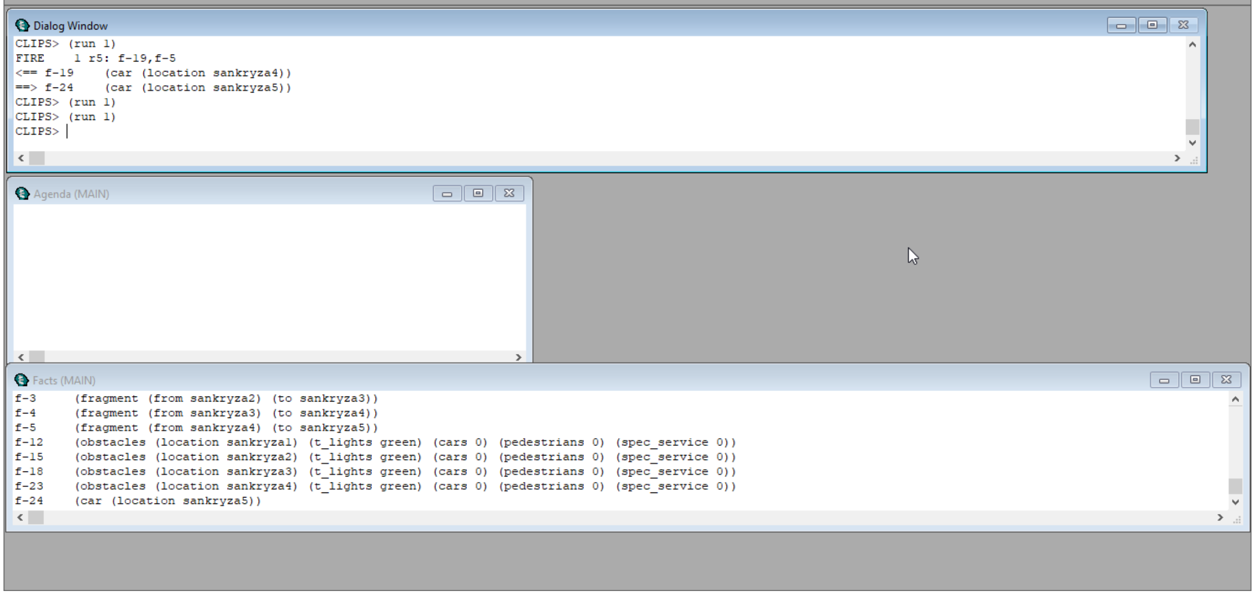
```
f-3     (fragment (from sankryza2) (to sankryza3))
f-4     (fragment (from sankryza3) (to sankryza4))
f-5     (fragment (from sankryza4) (to sankryza5))
f-7     (obstacles (location sankryza2) (t_lights green) (cars 2) (pedestrians 0) (spec_service 0))
f-8     (obstacles (location sankryza3) (t_lights green) (cars 0) (pedestrians 2) (spec_service 0))
f-9     (obstacles (location sankryza4) (t_lights green) (cars 2) (pedestrians 0) (spec_service 2))
f-12    (obstacles (location sankryza1) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-13    (car (location sankryza2))
```



```
CLIPS> (run 1)
FIRE    1 r2: f-16,f-8
<== f-8     (obstacles (location sankryza3) (t_lights green) (cars 0) (pedestrians 2) (spec_service 0))
==> f-17    (obstacles (location sankryza3) (t_lights green) (cars 0) (pedestrians 1) (spec_service 0))
CLIPS> (run 1)
FIRE    1 r1: f-16,f-17
CLIPS>
```

```
15      r2: f-16,f-17
10      r3: f-16,f-17
5       r4: f-16,f-17
0       r5: f-16,f-4
```

```
f-3     (fragment (from sankryza2) (to sankryza3))
f-4     (fragment (from sankryza3) (to sankryza4))
f-5     (fragment (from sankryza4) (to sankryza5))
f-9     (obstacles (location sankryza4) (t_lights green) (cars 2) (pedestrians 0) (spec_service 2))
f-12    (obstacles (location sankryza1) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-15    (obstacles (location sankryza2) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-16    (car (location sankryza3))
f-17    (obstacles (location sankryza3) (t_lights green) (cars 0) (pedestrians 1) (spec_service 0))
```



```
CLIPS> (run 1)
FIRE    1 r5: f-19,f-5
<== f-19    (car (location sankryza4))
==> f-24    (car (location sankryza5))
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> |
```

```
f-3     (fragment (from sankryza2) (to sankryza3))
f-4     (fragment (from sankryza3) (to sankryza4))
f-5     (fragment (from sankryza4) (to sankryza5))
f-12    (obstacles (location sankryza1) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-15    (obstacles (location sankryza2) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-18    (obstacles (location sankryza3) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-23    (obstacles (location sankryza4) (t_lights green) (cars 0) (pedestrians 0) (spec_service 0))
f-24    (car (location sankryza5))
```

.