KAUNO TECHNOLOGIJOS UNIVERSITETAS
INFORMATIKOS FAKULTETAS

Intelektikos Pagrindai (P176B101)

Pirmojo laboratorinio darbo ataskaita

Atliko:

IFF – 6/8 gr. studentas

Tadas Laurinaitis

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Priėmė:

Lekt. Germanas Budnikas

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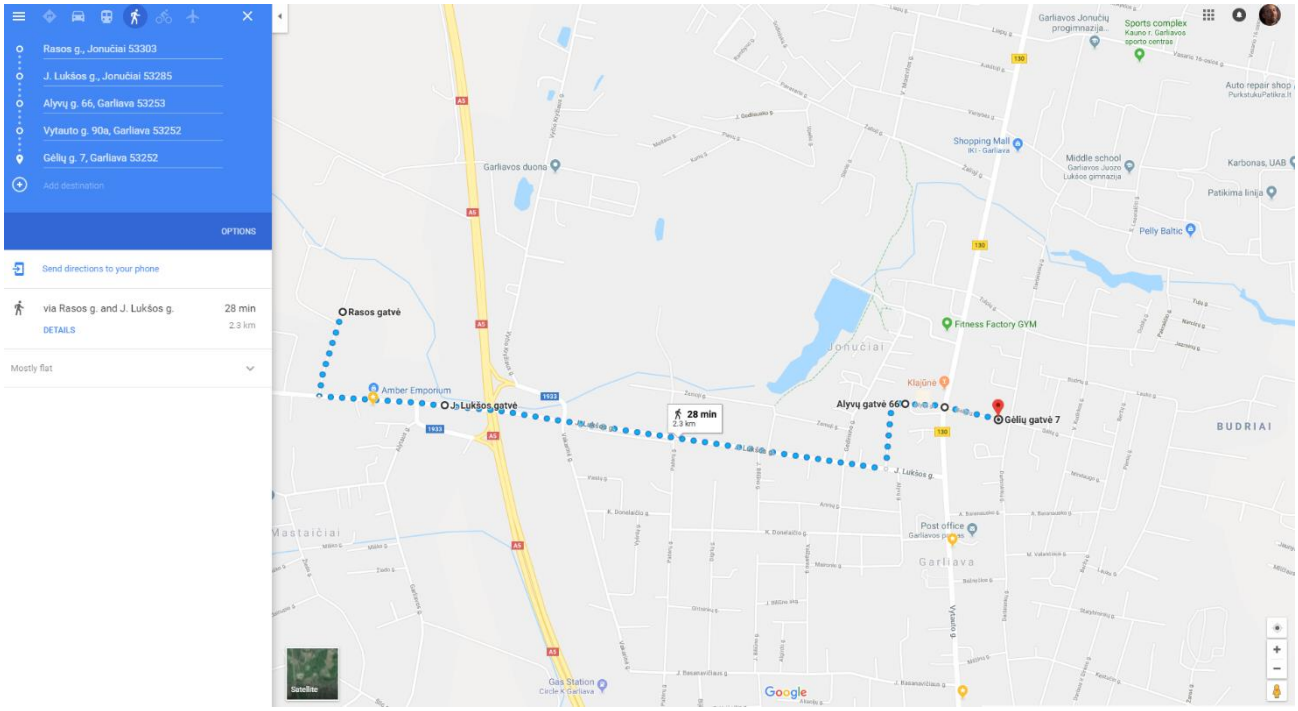
Darbo užduotys

Individuali užduotis

Sukurti taisyklėmis grįstą sistemą, aprašančią autonominės mašinos judėjimą pasirinktu maršrutu. Maršrute, kuris skaidomas į fragmentus ties kiekvieną sankryžą, gali būti kliūčių - pėsčiųjų, šviesoforų, kitų mašinų, spec. tarnybų automobilių. Judėjimas maršruto atkarpoje leidžiamas tik nesant kliūtims. Sistemoje iliustruoti autonominės mašinos judėjimą nurodytu maršrutu informuojant apie pravažiuojamas gatves ir kliūčių sumažėjimą važiuojamoje maršruto atkarpoje. Numatyti galimybę programoje papildyti norimą kiekį kliūčių bei pakoreguoti maršrutą.

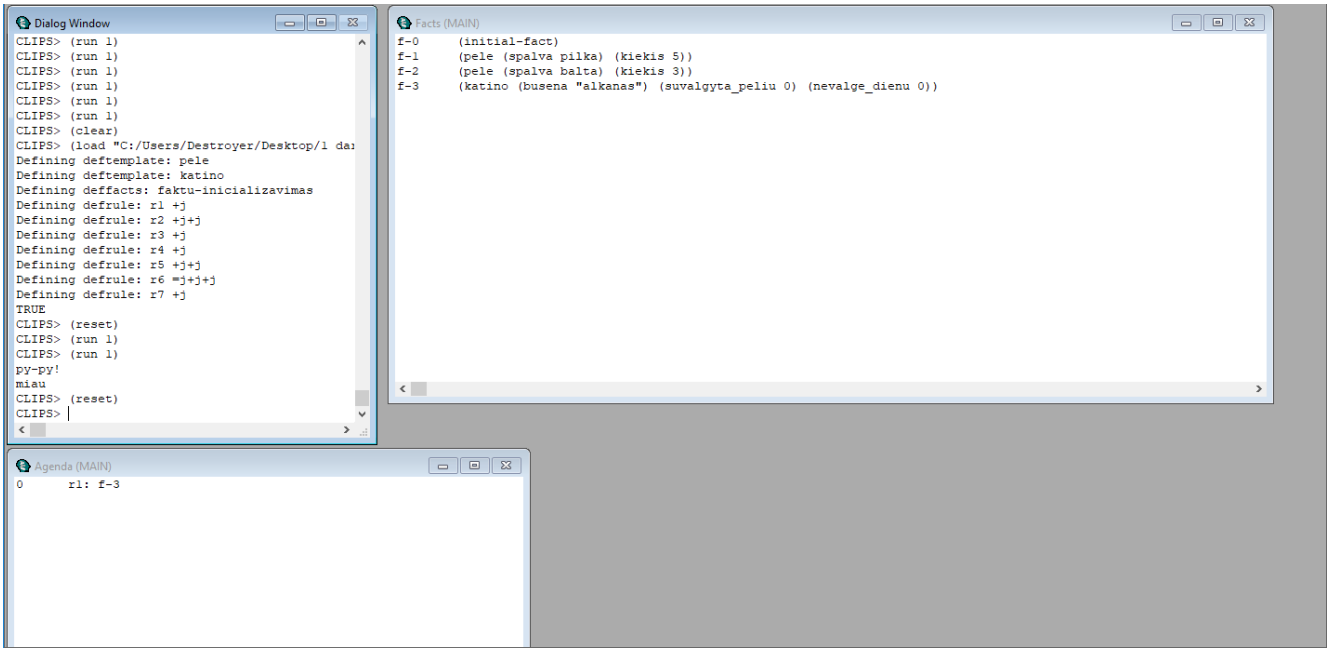
Maršrutui nustatyti parinkti savo namų vietą. Nustatyti judėjimo kryptį per x sankryžų, kur x – raidžių skaičius jūsų varde arba pavardėje (kas trumpiau).

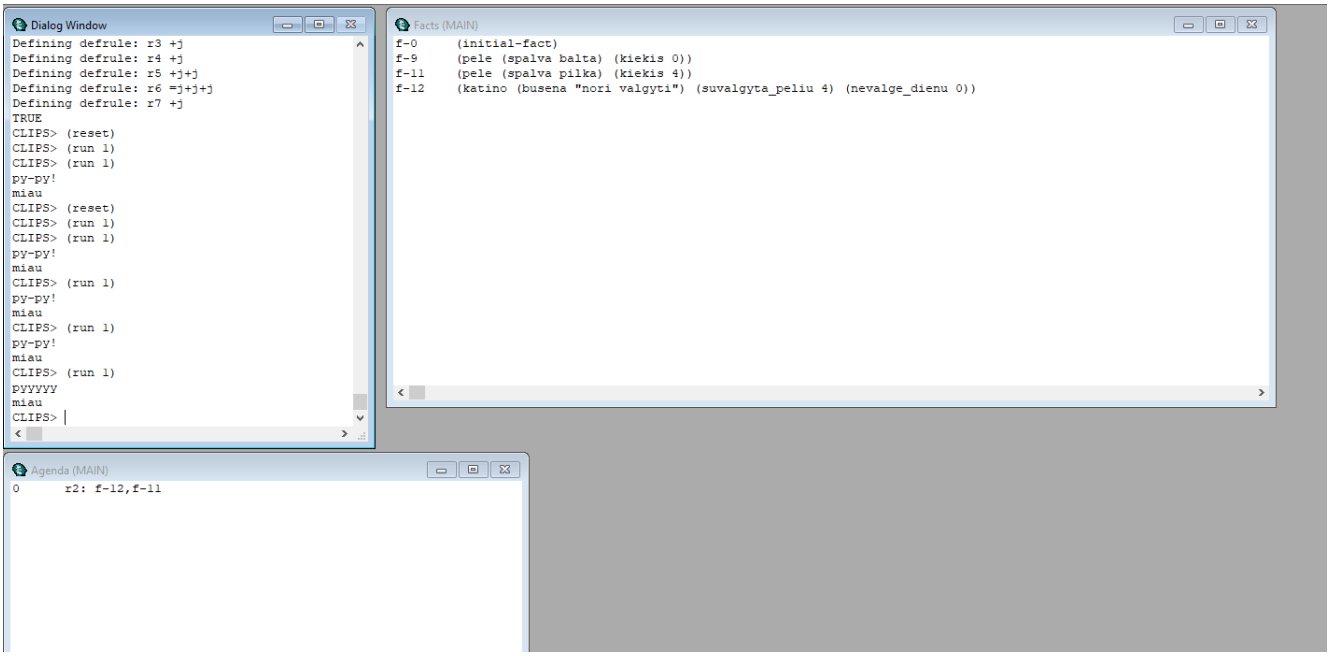
Vardas – Tadas – 5 raidės, 5 sankryžos. Pradinė vieta – Rasos gatvė, galutinė – Gėlių gatvė.

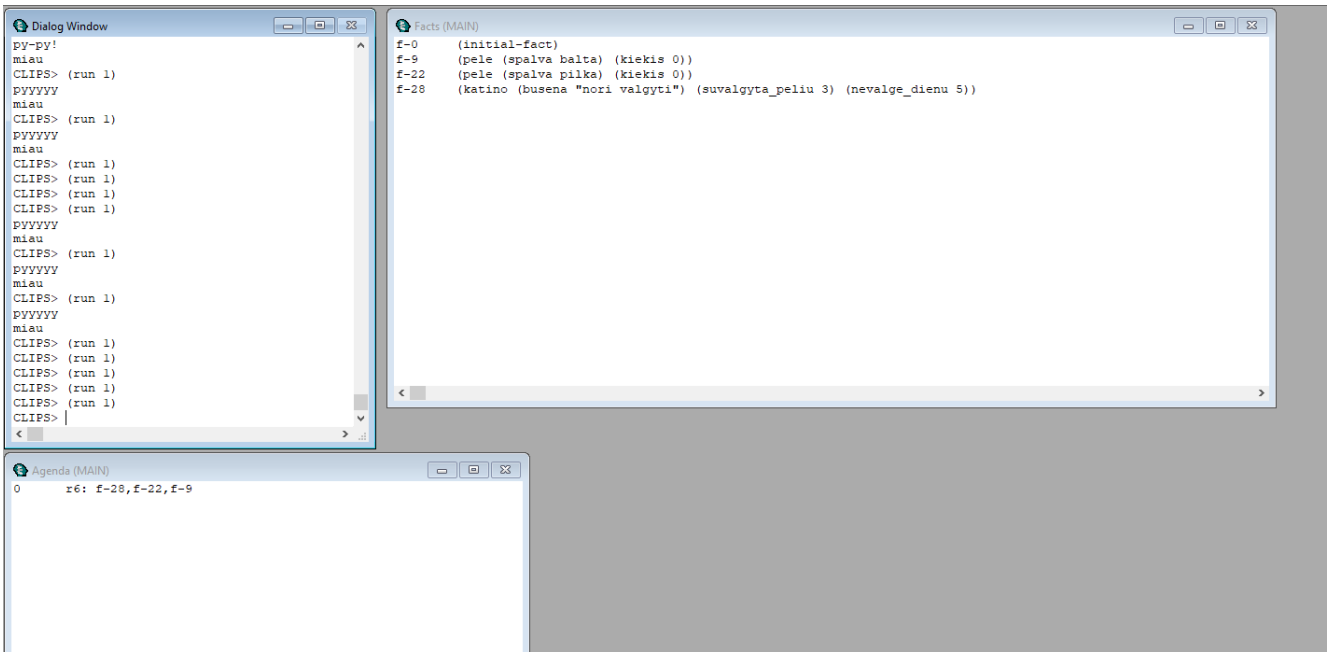


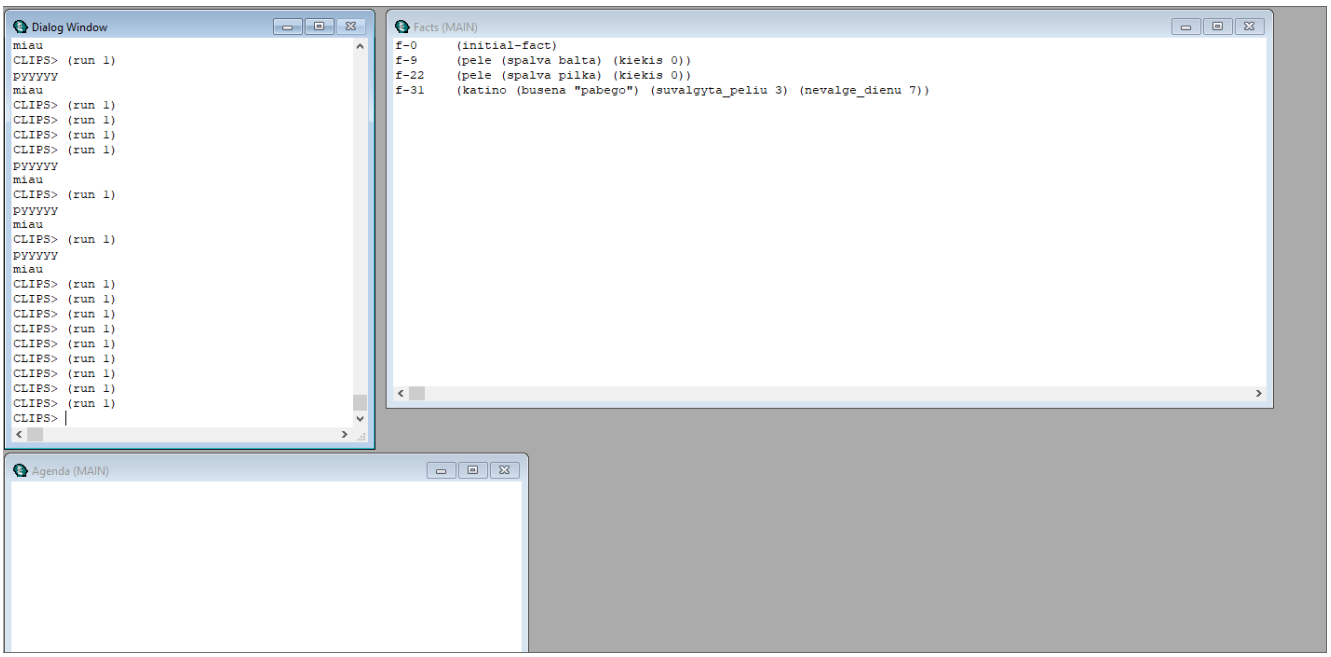
Užduočių sprendimų ekrano iškarpos

Kačių ir pelių programos vykdymas:




Dialog Window
Defining defrule: r3 +j
Defining defrule: r4 +j
Defining defrule: r5 +j+j
Defining defrule: r6 =j+j+j
Defining defrule: r7 +j
TRUE
CLIPS> (reset)
CLIPS> (run 1)
CLIPS> (run 1)
py-py!
miau
CLIPS> (reset)
CLIPS> (run 1)
CLIPS> (run 1)
py-py!
miau
CLIPS> (run 1)
py-py!
miau
CLIPS> (run 1)
py-py!
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS>
Facts (MAIN)
f-0 (initial-fact)
f-9 (pele (spalva balta) (kiekis 0))
f-11 (pele (spalva pilka) (kiekis 4))
f-12 (katino (busena "nori valgyti") (suvalgyta_peliu 4) (nevalge_dienu 0))
Agenda (MAIN)
0 r2: f-12,f-11


Dialog Window
py-py!
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS>
Facts (MAIN)
f-0 (initial-fact)
f-9 (pele (spalva balta) (kiekis 0))
f-22 (pele (spalva pilka) (kiekis 0))
f-28 (katino (busena "nori valgyti") (suvalgyta_peliu 3) (nevalge_dienu 5))
Agenda (MAIN)
0 r6: f-28,f-22,f-9


Dialog Window
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
pyyyyy
miau
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CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS>
Facts (MAIN)
f-0 (initial-fact)
f-9 (pele (spalva balta) (kiekis 0))
f-22 (pele (spalva pilka) (kiekis 0))
f-31 (katino (busena "pabego") (suvalgyta_peliu 3) (nevalge_dienu 7))
Agenda (MAIN)

Kelio radimo programos vykdymas:

Dialog Window

```
CLIPS> (run 1)
pyyyyy
miau
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (clear)
CLIPS> (load "C:/Users/Destroyer/Desktop/1 da
Defining deftemplate: fragment
Defining deftemplate: car
Defining deftemplate: obstacles
Defining deffacts: faktu-inicializavimas
Defining defrule: r1 +j+j
Defining defrule: r2 =j+j
Defining defrule: r3 =j+j
Defining defrule: r4 =j+j
Defining defrule: r5 =j+j+j
TRUE
CLIPS> (reset)
CLIPS>
```

Facts (MAIN)

```
f-0     (initial-fact)
f-1     (car (location A))
f-2     (fragment (from A) (to B) (from_street_name Rasos) (to_street_name Alytaus))
f-3     (fragment (from B) (to C) (from_street_name Alytaus) (to_street_name Luksos))
f-4     (fragment (from C) (to D) (from_street_name Luksos) (to_street_name Vytauto))
f-5     (fragment (from D) (to E) (from_street_name Vytauto) (to_street_name Geliu))
f-6     (obstacles (location A) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 0))
f-7     (obstacles (location B) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 1))
f-8     (obstacles (location C) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 2))
f-9     (obstacles (location D) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 3))
```

Agenda (MAIN)

```
0      r1: f-1,f-6
0      r2: f-1,f-6
0      r3: f-1,f-6
0      r4: f-1,f-6
```

Dialog Window

```
Defining deftemplate: obstacles
Defining deffacts: faktu-inicializavimas
Defining defrule: r1 +j+j
Defining defrule: r2 =j+j
Defining defrule: r3 =j+j
Defining defrule: r4 =j+j
Defining defrule: r5 =j+j+j
TRUE
CLIPS> (reset)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
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CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS>
```

Facts (MAIN)

```
f-0     (initial-fact)
f-2     (fragment (from A) (to B) (from_street_name Rasos) (to_street_name Alytaus))
f-3     (fragment (from B) (to C) (from_street_name Alytaus) (to_street_name Luksos))
f-4     (fragment (from C) (to D) (from_street_name Luksos) (to_street_name Vytauto))
f-5     (fragment (from D) (to E) (from_street_name Vytauto) (to_street_name Geliu))
f-7     (obstacles (location B) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 1))
f-8     (obstacles (location C) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 2))
f-9     (obstacles (location D) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 3))
f-14    (obstacles (location A) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
f-15    (car (location B))
```

Agenda (MAIN)

```
0      r1: f-15,f-7
0      r2: f-15,f-7
0      r3: f-15,f-7
0      r4: f-15,f-7
```

Dialog Window

```
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
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CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS> (run 1)
CLIPS>
```

Facts (MAIN)

```
f-0     (initial-fact)
f-2     (fragment (from A) (to B) (from_street_name Rasos) (to_street_name Alytaus))
f-3     (fragment (from B) (to C) (from_street_name Alytaus) (to_street_name Luksos))
f-4     (fragment (from C) (to D) (from_street_name Luksos) (to_street_name Vytauto))
f-5     (fragment (from D) (to E) (from_street_name Vytauto) (to_street_name Geliu))
f-14    (obstacles (location A) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
f-21    (obstacles (location B) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
f-29    (obstacles (location C) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
f-38    (obstacles (location D) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
f-39    (car (location E))
```

Agenda (MAIN)

Programų kodai

Kačių ir pelių programos 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 katinas storas, jis miega"
  ?fact-id1 <- (katino (busena ?busena))
  (test (eq ?busena "storas"))
  =>
  (modify ?fact-id1 (busena "miega"))
)
(defrule r5 "Kai storas katinas pamiega, jis tampa alkanas"
  ?fact-id1 <- (katino (busena ?busena))
  ?fact-id2 <- (katino (suvalgyta_peliu ?suvalgyta_peliu))
  (test (eq ?busena "miega"))
  =>
  (modify ?fact-id1 (busena "nori valgyti") (suvalgyta_peliu 0))
```

```
)
(defrule r6 "Katinas siandien nevalge"
  ?fact-id1 <- (katino (busena "nori valgyti") (nevalge_dienu ?nevalge_dienu))
  (pele (spalva pilka) (kiekis 0))
  (pele (spalva balta) (kiekis 0))
  =>
  (modify ?fact-id1 (nevalge_dienu (+ ?nevalge_dienu 1)))
)
(defrule r7 "Kai katinas nevalge 7 dienas, jis pabega"
  (declare (salience 5))
  ?fact-id1 <- (katino (busena "nori valgyti")  (nevalge_dienu 7))

  =>
  (modify ?fact-id1 (busena "pabego"))
)

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

Kelio radimo programos kodas:

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

(deftemplate fragment (slot from)(slot to) (slot from_street_name) (slot to_street_name))
(deftemplate car (slot location))
(deftemplate obstacles (slot location) (slot t_lights) (slot cars) (slot pedestrians) (slot spec_service))

(deffacts faktu-inicializavimas
  (car (location A))
  (fragment (from A) (to B) (from_street_name Rasos) (to_street_name Alytaus))
  (fragment (from B) (to C) (from_street_name Alytaus) (to_street_name Luksos))
  (fragment (from C) (to D) (from_street_name Luksos) (to_street_name Vytauto))
  (fragment (from D) (to E) (from_street_name Vytauto) (to_street_name Geliu))
  (obstacles (location A) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 0))
  (obstacles (location B) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 1))
  (obstacles (location C) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 2))
  (obstacles (location D) (t_lights 1) (cars 2) (pedestrians 2) (spec_service 3))
  ;(obstacles (location E) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
)

(defrule r1 "Kai esamoje sankryzoje yra sviesoforu, laukiam"
  ?fact-id1 <- (car (location ?location))
  ?fact-id2 <- (obstacles (location ?location) (t_lights ?t_lights))
  =>
  (if (> ?t_lights 0) then (modify ?fact-id2 (t_lights (- ?t_lights 1)))
  )
)
(defrule r2 "Kai esamoje sankryzoje yra masinu, laukiam"
  ?fact-id1 <- (car (location ?location))
  ?fact-id2 <- (obstacles (location ?location) (cars ?cars))
  =>
  (if (> ?cars 0) then (modify ?fact-id2 (cars (- ?cars 1)))
  )
```

```
)
(defrule r3 "Kai esamoje sankryzoje yra pesciuju, laukiam"
  ?fact-id1 <- (car (location ?location))
  ?fact-id2 <- (obstacles (location ?location) (pedestrians ?pedestrians))
  =>
  (if (> ?pedestrians 0) then (modify ?fact-id2 (pedestrians (- ?pedestrians 1)))
  )
)
(defrule r4 "Kai esamoje sankryzoje yra specialiu tarnybu, laukiam"
  ?fact-id1 <- (car (location ?location))
  ?fact-id2 <- (obstacles (location ?location) (spec_service ?spec_service))
  =>
  (if (> ?spec_service 0) then (modify ?fact-id2 (spec_service (- ?spec_service 1)))
  )
)
(defrule r5 "Kai nebeliko kliuciu, judam toliau"
  ?fact-id1 <- (car (location ?location))
  ?fact-id2 <- (fragment (from ?location) (to ?to))
  ?fact-id3 <- (obstacles (location ?location) (t_lights 0) (cars 0) (pedestrians 0) (spec_service 0))
  =>
  (modify ?fact-id1 (location ?to))
)

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