**P1** Liste in Prolog(I)

Data predare: 20.10.2021

Numarul + enuntul problemei: 11

a. Sa se scrie un predicat care sa testeze daca o lista formata din numere intregi are aspect de "vale"(o multime se spune ca are aspect de "vale" daca elementele descresc pana la un moment dat, apoi cresc. De ex. 10 8 6 9 11 13).

b. Sa se calculeze suma alternanta a elementelor unei liste (l1 - l2 + l3 ...).

Modelele recursive:

a.

L=l1l2..ln

l1 =l2..ln

vale(L, Up, Low) = {false, n<3

{false, Li==Li+1

{vale(L2..Ln, Up++, Low), L1>L2 si Low<=1

{false, Li>Li+1 si Low>1

{vale(L1, Up, Low++), Li<Li+1

{true, Up>1 si Low>1

{false, Up<=1 si Low<=1

f(L)=vale(L,1,1)

b.

L=l1l2..ln

L1= l2..ln

sumaAlt(L,Index) = { 0, n=0

{ L1 + sumaAlt( L2.. Ln, Index+1), Index%2==0

{ sumaAlt(L1, Index+1, Suma -= LIndex), Index%2!=0

Suma(L,S)=sumaAlt(L,0,S)

Modelul de flux al predicatelor:

1. vale(L,Up,Low) (i,i,i)

vale(Up,Low) (i,i)

f(L) (i)

1. sumaAlt (i,i,o) sau (i,i,i)

suma (i,o) sau (i,i)

Semnificatia argumentelor predicatelor:

a.

L- lista de numere indexata de la 0

Up- variabila ajutatoare

Low- variabila ajutatoare

[H|[H1|T]- H- capul listei, H1|T- coada listei

b.

L- lista de numere indexata de la 0

[H|T]- H- capul listei, T- coada listei

Index- indexul elementului curent in lista

Suma- variabila in care calculam suma alternanta

Cod sursa:

Exemple testare:

a.

vale([12,10,9,4,5,6,7],1,1) => true

vale([1,1,1,1],1,1) => false

vale([],1,1) => false

vale([2,3],1,1) => false

vale([34,5,9],1,1) => true

vale([22,13,4,56,2,6,8],1,1) => false

vale([12,9,6,3,5,6,7,8],1,1 ) => true

vale([54,43,20,33],1,1) => true

b.

sumaAlt([1,2,3,4], 1, X) => X=-2

sumaAlt([], \_, X) => X=0

sumaAlt([1,1,1,1], 1, X) => X=0

sumaAlt([1,-1,1,-1], 1, X) => X=4