Задача 11

domains

int=integer

A,B,C,D,E = integer

list=int\*

predicates

sum\_n(list,int,list,list)

append(list,list,list)

clauses

append([],L,L):-!.

append([H|T],P,[H|Y]):-append(T,P,Y).

/\* óâåëè÷èòü êàæäûé ýëåìåíò ñïèñêà íà çàäàííîå ÷èñëî \*/

sum\_n([],\_,M,M):-!.

sum\_n([H|T],N,L,List):-H1=H+N,

append(L,[H1],L2),

sum\_n(T,N,L2,List).

goal

write("This program addition digit 1 to list"),nl,

write("For example, input 5 numbers to List and program will add to your list plus 1"),nl,

write("INPUT>>"),readInt(A),write(A),nl,

readInt(B),nl,

readInt(C),nl,

readInt(D),nl,

readInt(E),nl,

sum\_n([A,B,C,D,E],1,[],List2),write(List2),nl.

Задача 17.1

domains

int=integer

list=int\*

predicates

change\_single\_list\_element(list, integer, integer, list)

nondeterm run

nondeterm do(char)

nondeterm readlist(list)

clauses

clauses

readlist([Head|Tail]):-

write("enter element of the list. Entering an empty value will finish op. INPUT >> "),

readint(Head),!,readlist(Tail).

readlist([]).

change\_single\_list\_element([], \_A, \_B, []):-!.

change\_single\_list\_element([A|Tail], A, B, [B|Tail]):-!.

change\_single\_list\_element([Head|Tail], A, B, [Head|ChangedTail]):-

change\_single\_list\_element(Tail, A, B, ChangedTail).

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readlist(L),nl,

write("Entered list L = "),write(L),nl,

write("Enter a digit witch you want to replace"),nl,

write("INPUT>>"),readint(A),nl,

write("Enter a new digit. (Will replace an inputted digit instead) "),nl,

write("INPUT>>"),readint(B),nl,

change\_single\_list\_element(L,A,B,X),write("Entered list L = "),write(L),nl,write("The new list is :",X),nl.

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 23

domains

list\_d = integer\*

predicates

nondeterm last(list\_d)

readlist(list\_d)

nondeterm main\_menu

nondeterm main\_menu\_item(integer)

nondeterm list\_menu

nondeterm list\_menu\_item(integer)

clauses

last([X]):-write(X).

last([X|Tail]):-

last(Tail).

readlist([H|Tail]):-readInt(H),!,readlist(Tail).

readlist([]).

list\_menu\_item(0):- !.

list\_menu\_item(1):-

write("INPUT>>"),

readlist(L),nl,

write("Your enter the list L ="),nl,

write(L),nl,

write("the last elem of your list="),

last(L),nl,!.

%list\_menu\_item(\_Item):-

%write("Bad choice. Enter correct [0-1] please"),nl,

%list\_menu.

list\_menu:-

write("1 - enter list and show result"),nl,

write("0 - back to main menu"),nl,

readInt(Item), list\_menu\_item(Item).

main\_menu\_item(0):-!.

main\_menu\_item(1):-

list\_menu,main\_menu,!.

main\_menu:-

write("1 - choose your operation"),nl,

write("0 - exit"),nl,

readInt(Item), main\_menu\_item(Item).

goal

main\_menu.

Задача 25.

domains

int=integer

list=int\*

predicates

nondeterm run

nondeterm do(char)

nondeterm readlist(list)

nondeterm p(list,int)

clauses

readlist([Head|Tail]):-

write("enter element of the list. Entering an empty value will finish op. INPUT >> "),

readint(Head),!,readlist(Tail).

readlist([]).

p([X,\_],X).

p([\_|T],X):-p(T,X).

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readlist(L),nl,

p(L,X),write("Entered list L = "),write(L),write("Penultimate element is :",X),nl.

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 37

domains

i=integer il=i\*

predicates del(i,il,il)

nondeterm run

nondeterm do(char)

nondeterm readlist(il)

clauses

del(1,[\_|T],T):-!.

del(N,[\_,Y|T],L):-N1=N-1,

del(N1,[Y|T],L).

readlist([Head|Tail]):-

write("enter element of the list. Entering an empty value will finish op. INPUT >> "),

readint(Head),!,readlist(Tail).

readlist([]).

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readlist(L),nl,

write("Entered list L = "),write(L),nl,

write("INPUT A QUANTITY OF ELEMENTS WICH YOU WANT TO DELETE FROM THE LIST"),

nl,

readint(N),

del(N,L,X),write("The new list is :",X),nl,

write("YOU DELETED ",N),write("NUMBERS"),nl.

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 40

domains

list = integer\*

predicates

last\_elements(list, integer, list)

last\_elements(list, integer, integer, list)

nondeterm run

nondeterm do(char)

nondeterm readlist(list)

clauses

readlist([Head|Tail]):-

write("enter element of the list. Entering an empty value will finish op. INPUT >> "),

readint(Head),!,readlist(Tail).

readlist([]).

last\_elements(List, SublistLength, Sublist):-

last\_elements(List, \_EndPos, SublistLength, Sublist).

last\_elements([], 0, SublistLength, []):-!.

last\_elements([Head|Tail], EndPos, SublistLength, Sublist):-

last\_elements(Tail, TailEndPos, SublistLength, SublistTail),

TailEndPos >= SublistLength, !,

Sublist = SublistTail, EndPos = TailEndPos + 1.

last\_elements([Head|Tail], EndPos, SublistLength, Sublist):-

last\_elements(Tail, TailEndPos, SublistLength, SublistTail),

TailEndPos < SublistLength, !,

Sublist = [Head|SublistTail], EndPos = TailEndPos + 1.

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readlist(L),nl,

write("Enter a number of last elements that will be created a new list in the same order"),nl,

write("N = "), readint(N),

last\_elements(L, N, X),

write("Entered list L = "),write(L),write("Result list is :",X),nl.

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 51

domains

list = integer\*

predicates

change\_sublist\_to\_const(list, integer, integer, integer, list)

nondeterm run

nondeterm do(char)

nondeterm readlist(list)

clauses

readlist([Head|Tail]):-

write("enter element of the list. Entering an empty value will finish op. INPUT >> "),

readint(Head),!,readlist(Tail).

readlist([]).

change\_sublist\_to\_const(List, 0, 0, \_Val, List):-!.

change\_sublist\_to\_const([\_Head|Tail], 0, M, Val, [Val|ChangedTail]):-

NextM = M - 1, !,

change\_sublist\_to\_const(Tail, 0, NextM, Val, ChangedTail).

change\_sublist\_to\_const([Head|Tail], N, M, Val, [Head|ChangedTail]):-

NextN = N - 1,

change\_sublist\_to\_const(Tail, NextN, M, Val, ChangedTail).

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readlist(L),nl,

write("enter from which position you want to replace"),nl,

write("POS = "),readint(POS),nl,

write("enter quantity of elements you want to replace"),nl,

write("QUANTITY OF ELEMENTS = "),readint(Q),nl,

write("enter a constant"),nl,

write("CONSTANT = "),readint(C),nl,

change\_sublist\_to\_const(L, POS, Q, C, X),write("Entered list L = "),write(L),nl,

write("Result list is :",X),nl.

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 57

domains

int = integer

list = int\*

predicates

nondeterm run

nondeterm do(char)

nondeterm readlist(list)

nondeterm max(list, integer)

nondeterm min(list, integer)

nondeterm inner(list, integer)

nondeterm outer(list, integer, integer)

clauses

readlist([H|T]):-

write(">> "), readint(H), !, readlist(T).

readlist([]).

max([X], X).

max([H|T],H):-max(T,M),H>M,!.

max([\_|T],M):-max(T,M).

min([X], X).

min([H|T],H):-min(T,M),H<M,!.

min([\_|T],M):-min(T,M).

inner([], C):-write("\t", C),nl.

inner([\_|T], C):-

C = 0, !,

write(" - "),

inner(T, C).

inner([H|T], C) :-

C > 0,

H >= C, !,

write(" | "),

inner(T, C).

inner([H|T], C) :-

C < 0,

H <= C, !,

write(" | "),

inner(T, C).

inner([\_|T], C) :-

write(" "),

inner(T, C).

outer(L, C, N):-

C >= N,

NewC = C - 1,

inner(L, C),

outer(L, NewC, N).

outer(\_, C, C):-nl.

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readlist(L),nl,

max([0|L],Max),min([0|L],Min),nl,

outer(L,Max,Min).

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 75.1

domains

int = integer

intl = int\*

predicates

nondeterm run

nondeterm do(char)

nondeterm take(int,intl,intl)

nondeterm drop(int,intl,intl)

append(intl,intl,intl)

len(intl,int)

nondeterm rotl(int,intl,intl)

nondeterm readlist(intl)

clauses

readlist([H|T]) :- readint(H),!,readlist(T).

readlist([]).

take(0,\_,[]).

take(K,[H|X],[H|Y]) :- K1=K-1, take(K1,X,Y).

drop(0,X,X).

drop(K,[\_|H],Z) :- K1=K-1, drop(K1,H,Z).

append([],X,X).

append([H|T],X,[H|Y]) :- append(T,X,Y).

len([],0).

len([\_|T],N):- len(T,N1), N=N1+1.

rotl(N,X,Y) :- len(X,L), M=N mod L, take(M,X,X1), drop(M,X,X2), append(X2,X1,Y).

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

write("INPUT>>"),nl,

readlist(L),

write("Enter a digit of the List which will be slided LEFT"),nl,

readint(N),nl,

write("Your entered list L = "),write(L),nl,

rotl(N, L, Y),write("The result list Y = "),write(Y).

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.

Задача 82. (Убрать рисование или заменить предикат на лекционное)

domains

int = integer

int1 = int\*

treetype = node(treetype,treetype,int);null

predicates

nondeterm run

nondeterm do(char)

counter(treetype,int)

nondeterm print\_tree(treetype, integer)

nondeterm print\_spaces(integer)

nondeterm insInTree(treetype,int,treetype)

nondeterm list2tree(int1,treetype)

nondeterm readlist(int1)

nondeterm readTree(treetype)

clauses

%Vvod dereva!!!!

insInTree(null,X,node(null,null,X)).

insInTree(node(L,R,V),X,node(LL,R,V)) :- V>X, insInTree(L,X,LL).

insInTree(node(L,R,V),X,node(L,RR,V)) :- V<=X, insInTree(R,X,RR).

list2tree([],null).

list2tree([H|T],Tree) :- list2tree(T,Tree1), insInTree(Tree1,H,Tree).

readlist([H|T]) :- readint(H),!,readlist(T).

readlist([]).

readTree(U) :- write("Enter tree elements:"),nl,readlist(Z),list2tree(Z,U).

%Vivod dereva!!!!

print\_tree(null, \_Depth):-!.

print\_tree(node(Left, Right,TopValue), Depth):-

SubtreesDepth = Depth + 1,

print\_tree(Left, SubtreesDepth),

print\_spaces(Depth), write(TopValue), write("<"), nl,

print\_tree(Right, SubtreesDepth).

print\_spaces(SpaceNumber):-

SpaceNumber <= 0, !;

write("\t"),

TailSpaceNumber = SpaceNumber - 1,

print\_spaces(TailSpaceNumber).

%Podschet list'ev dereva

counter(null,0).

counter(node(L,R,\_),N) :- counter(L,NL), counter(R,NR), N=NL+NR+1.

run:-

write("Welcome"),nl,

write("enter 1 to start the program"),nl,

write("enter 0 to exit"),nl,

write("Choose the command >>"),readchar(N),write(N),nl,

do(N),

run.

do('1'):-

readTree(U), write("Your tree: "),nl, print\_tree(U,0), nl, write("Number of nodes: "),counter(U,K), write(K),nl.

do('0'):-

write("Done"),exit.

do(\_):-

write("wrong choice").

goal

run.