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D4 Teknik Informatika 2A

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1.

Source Code :

```
replace_all([],_,_,[]).  
  
replace_all([H|T],A,B,[B|Result]) :-  
    H=A,  
    replace_all(T,A,B,Result).  
  
replace_all([H|T],A,B,[H|Result]) :-  
    replace_all(T,A,B,Result).
```

Output :

```
?- replace_all([a,b,a,c,a,d],prolog,logic,Result).  
Result = [a, b, a, c, a, d].  
  
?- replace_all([a,b,a,c,a,d],a,mike,Result).  
Result = [mike, b, mike, c, mike, d].  
  
?- replace_all([a,b,a,c,a,d],b,foo,Result).  
Result = [a, foo, a, c, a, d].  
  
?- replace_all([a,b,a,c,a,d],prolog,logic,Result).  
Result = [a, b, a, c, a, d].
```

2.

Source Code:

```
numval(multiply(X,Y),Z):-  
    numval(X,H),  
    numval(Y,G),  
    Z is H*G.  
  
numval(add(X,Y),Z):-  
    numval(X,H),  
    numval(Y,G),  
    Z is H+G.  
  
numval(X,X):-  
    number(X).  
numval(X,X,X):-  
    number(X).▲
```

Output:

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```
?- numval(add(multiply(3,add(2,5)),add(2,3)),X).  
X = 26 .  
  
?- numval(multiply(3,add(2,5)),X).  
X = 21 .  
  
?- numval(add(multiply(3,multiply(2,5)),add(2,3)),X).  
X = 35 .  
  
?- numval(multiply(3,add(add(2,5),add(2,3))),X).  
X = 36 .  
  
?- numval(multiply(3,add(2,5)),X).  
X = 21 .
```

3.

Source Code :

```
tambah([],_,[]).  
tambah([H|X],Y,[H|Z]):-  
    append(X,Y,Z).
```

Output :

```
?- tambah([1,2,3],[4,5],Z).  
Z = [1, 2, 3, 4, 5].  
  
?- tambah([1,2,3,4,5],[4,5,7,8],Z).  
Z = [1, 2, 3, 4, 5, 4, 5, 7, 8].
```

4.

Source Code:

```
p([],[]).  
p([H|T],S):-  
    p(T,P),  
    append(X,Y,P),  
    append(X,[H|Y],S).
```

Output :

```
?- p([i,love,polban],P).  
P = [i, love, polban] ;  
P = [love, i, polban] ;  
P = [love, polban, i] ;  
P = [i, polban, love] ;  
P = [polban, i, love] ;  
P = [polban, love, i] ;  
.
```

5.

Source Code :

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```
unions([], [], []).
```

```
unions([], W, W).
```

```
unions([X|Y], Z, [X|W]) :-
```

```
    \+(member(X, Z)),
```

```
    union(Y, Z, W).
```

```
unions([X|Y], Z, W) :-
```

```
    member(X, Z),
```

```
    union(Y, Z, W).
```

Output:

```
?- union([1,2,3,4],[1,a,b,4],A).
```

```
A = [2, 3, 1, a, b, 4].
```

6.

Source Code :

```
ganda([], []).
```

```
ganda([H|T], [H,H|G]) :-
```

```
    ganda(T, G).
```

Output:

```
?- ganda([satu,dua,tiga,empat],G).
```

```
G = [satu, satu, dua, dua, tiga, tiga, empat, empat].
```

```
?- ganda(['2a','3b','4c'],G).
```

```
G = ['2a', '2a', '3b', '3b', '4c', '4c'].
```

```
?- ganda([bumbu,sayur,daging,masak],G).
```

```
G = [bumbu, bumbu, sayur, sayur, daging, daging, masak, masak].
```

7.

Source Code :

```
baris(X,X,[X]).
```

```
baris(X,Y,[X|Z]) :-
```

```
    X < Y,
```

```
    H is X+1,
```

```
    baris(H,Y,Z).
```

Output :

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```
?- baris(1,19,Z).
```

```
Z = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19] .
```

```
?- baris(1,100,A).
```

```
A = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100] .
```

```
?- baris(1,50,A).
```

```
A = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50] ■
```