LAB 5a

Rules:

R_0: $S_1[a,b,c,d,e] :- S_0(a,b,c,d,e)$

R_1: $S_1[a,b,c,d,e] :- S_2(b,c,d,e,a)$

R_2: $S_2(a,b,c,d,e) :- S_1(b,c,d,e,a)$

R_3: $S_1(a,b,c,d,e) :- S_1(b,a,c,d,e)$

R_4: $S_3(a,f,b,g,c,h,d,i) :- S_1(a,b,c,d,e), S_2(f,g,h,i,j)$

R_5: $S_4(a,b,c,d,e) :- S_3(a,b,z,y,c,d,e,i), S_5(m,n,x,y,z)$

R_6: $S_5(a,a,c,d,e) :- S_4(a,b,c,d,e), S_5(a,w,x,y,z)$

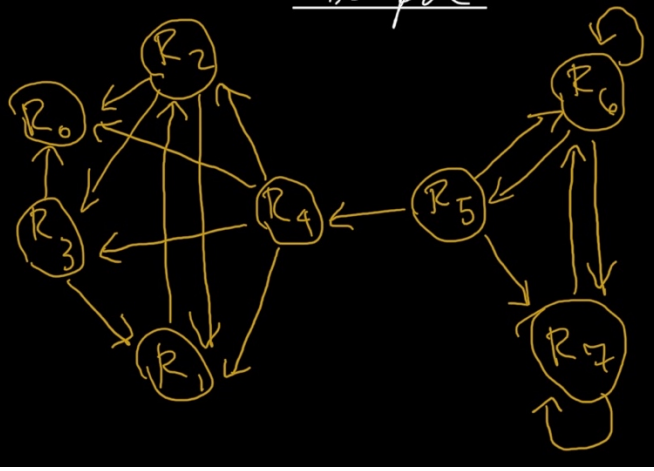
R_7: $S_5(a,b,c,d,e) :- S_5(e,a,b,c,d)$

Dependency graph

Output

R_0:
R_1: R_2
R_2: R_0, R_1, R_3
R_3: R_0, R_1
R_4: R_0, R_1, R_2, R_3
R_5: R_4, R_6, R_7
R_6: R_5, R_6, R_7
R_7: R_6, R_7

Graph

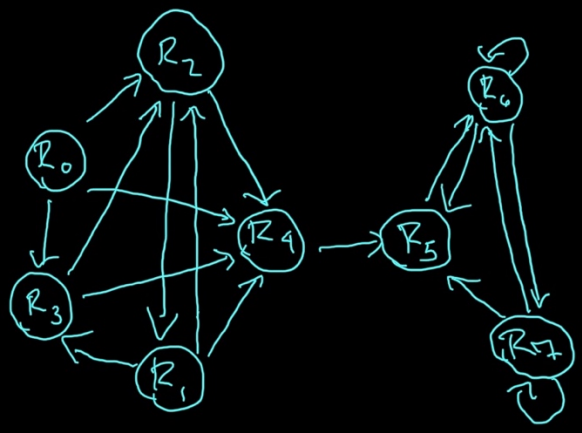


Reverse Dependency graph

Output

R_0 : R_2, R_3, R_4
R_1 : R_3, R_4
R_2 : R_1, R_4
R_3 : R_2, R_4
R_4 : R_5
R_5 : R_6
R_6 : R_5, R_6, R_7
R_7 : R_5, R_6, R_7

Graph



DFS on Reverse Dependency Graph

Postorder List	Visited Adj. List	Stack	DFS Forest
$[R_0, R_2, R_1, R_3]$	R_0 : R_2, R_3, R_4 ✓	~~R_0~~	
$[R_0, R_2, R_1, R_3, R_4, R_5, R_6]$	R_1 : R_3, R_4 ✓	~~R_2~~	
$[R_0, R_2, R_1, R_3, R_4, R_5, R_6, R_7]$	R_2 : R_1, R_4 ✓	~~R_1~~	
	R_3 : R_2, R_4 ✓	~~R_3~~	
	R_4 : R_5 ✓	~~R_4~~	
	R_5 : R_6 ✓	~~R_5~~	
	R_6 : R_5, R_6, R_7 ✓	~~R_6~~	
	R_7 : R_5, R_6, R_7 ✓	~~R_7~~	

DFS on Reverse of Post Order to get SCCs

Postorder list

[$R_0, R_2, R_1, R_3, R_4, R_5, R_6, R_7$]

[$R_0, R_2, R_1, R_3, R_4, R_5, R_6, R_7$]

[$R_0, R_2, R_1, R_3, R_4, R_5, R_6, R_7$]

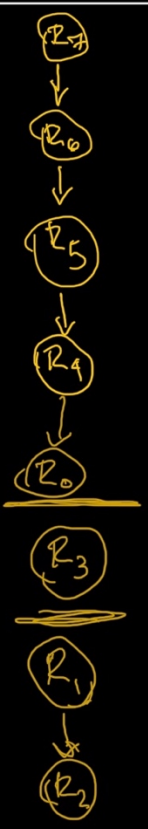
Visited Adj List

- ✓ R_0:
- ✓ R_1: R_2
- ✓ R_2: R_0, R_1, R_3
- ✓ R_3: R_0, R_1
- ✓ R_4: R_0, R_1, R_2, R_3
- ✓ R_5: R_4, R_6, R_7
- ✓ R_6: R_5, R_6, R_7
- ✓ R_7: R_6, R_7

Stack

~~R_7~~ ~~R_6~~ ~~R_5~~ ~~R_4~~ ~~R_0~~ ~~R_3~~ ~~R_1~~ ~~R_2~~ ~~R_0~~

DFS Forest



SCC's

SCC1 : R_7, R_6, R_5, R_4, R_0

SCC2 : R_3

SCC3 : R_1, R_2

* The colors of the SCC's correspond to the colors on the image below