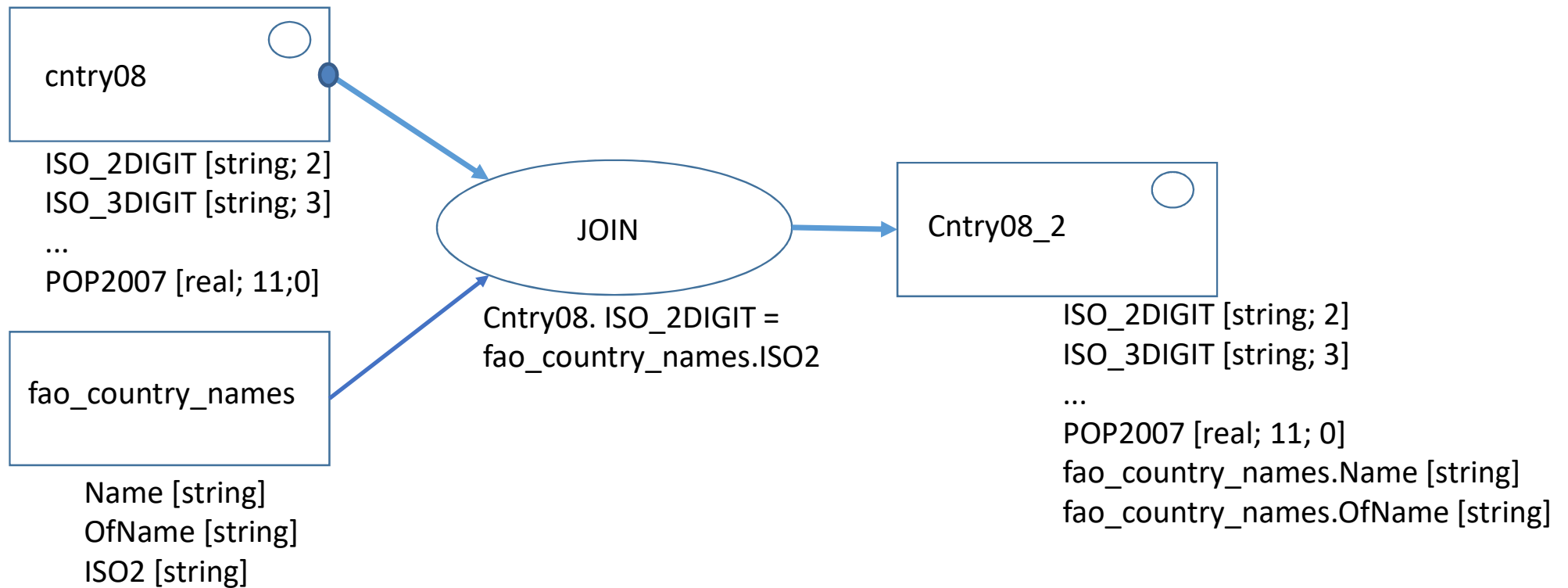











WGS84 Ellipsoid

Geodetic height=-20m



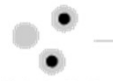









Mean sea level, approximated
by the Geoid



 point / point → nil	 point / point → multipoint	 point / multipoint → multipoint
 multipoint / multipoint → nil	 multipoint / multipoint → multipoint	 linestring / linestring → multilinestring
 linestring / linestring → nil	 polygon / polygon → nil	 polygon / polygon → polygon

Difference

 point / point → multipoint	 point / multipoint → multipoint
 multipoint / multipoint → multipoint	 point / linestring → multipoint
 multipoint / linestring → multipoint	 linestring / linestring → multilinestring
 point / polygon → multipoint	 multipoint / polygon → multipoint
 linestring / polygon → multilinestring	 polygon / polygon → multipolygon

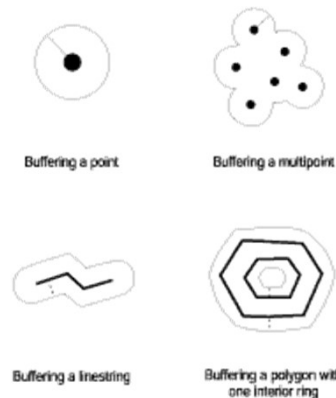
Intersection

From

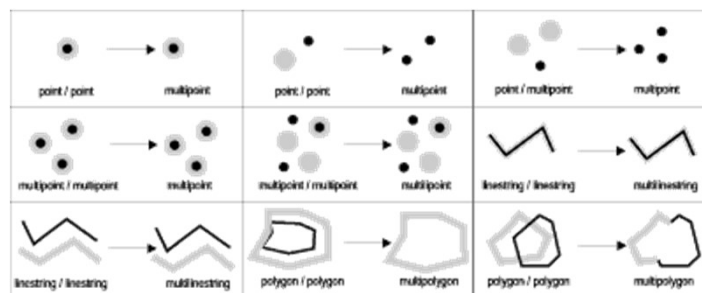
<http://publib.boulder.ibm.com/infocenter/db2luw/v8/in>



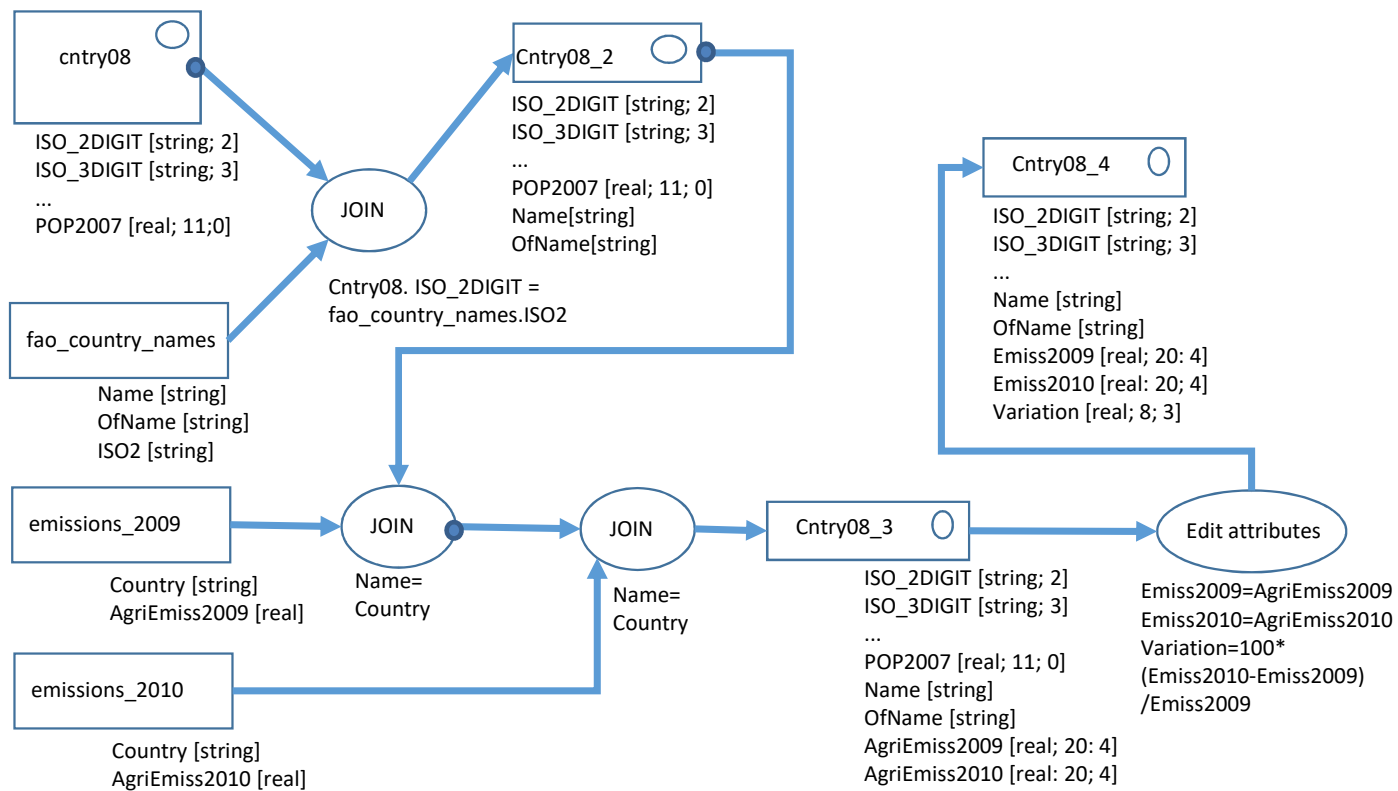
Convex hull

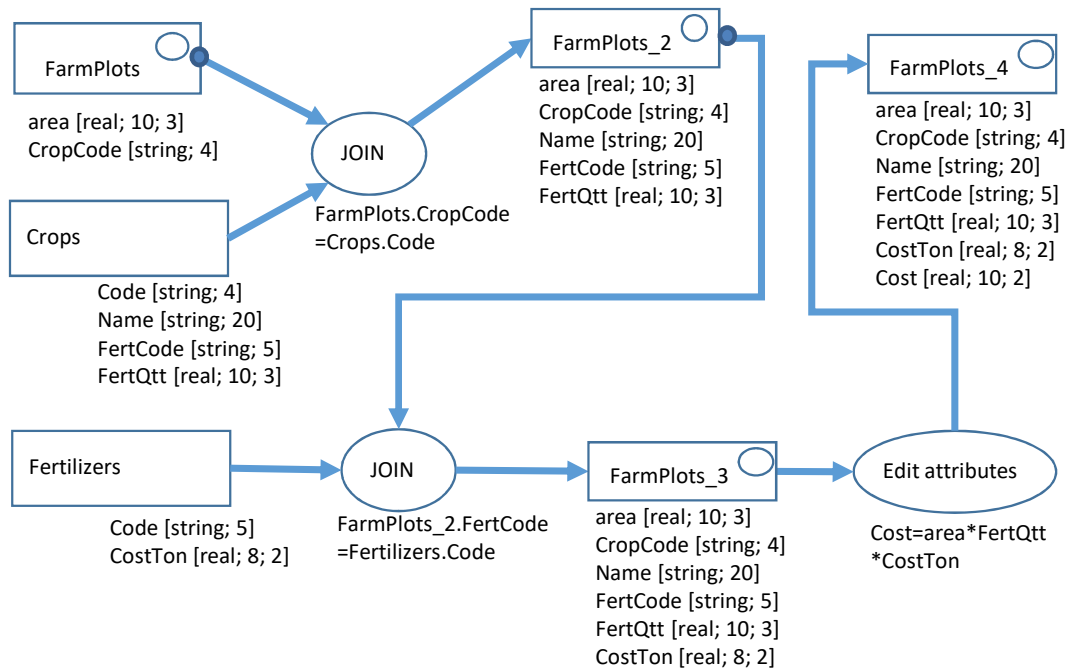


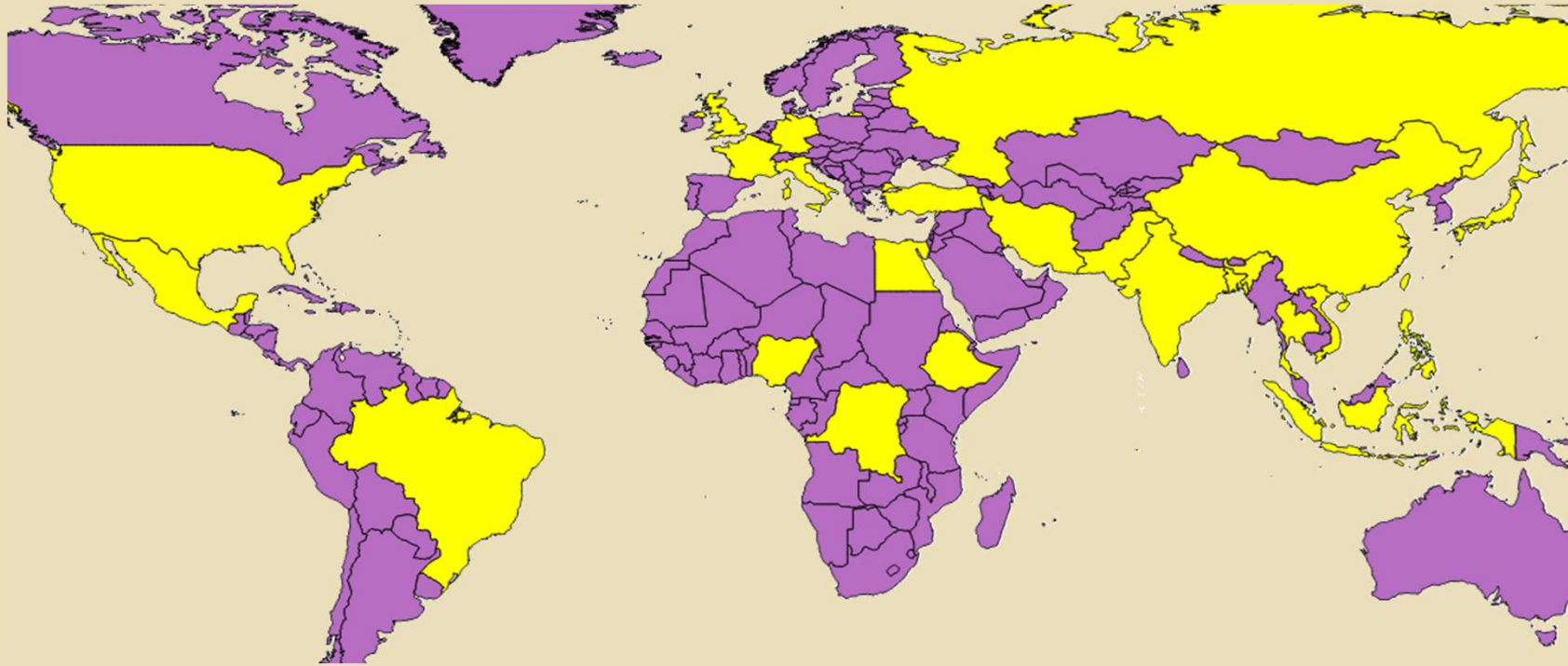
buffer



union

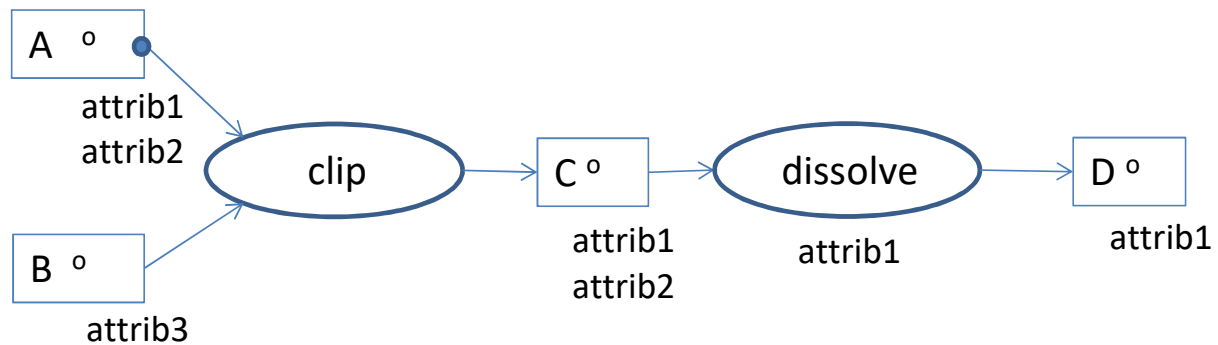






"POP2007" > 50000000

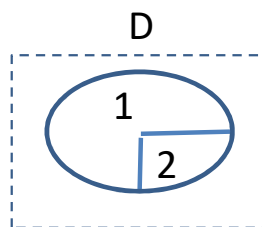
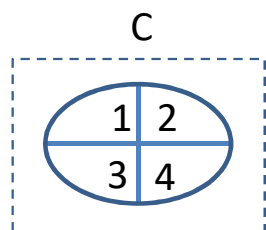
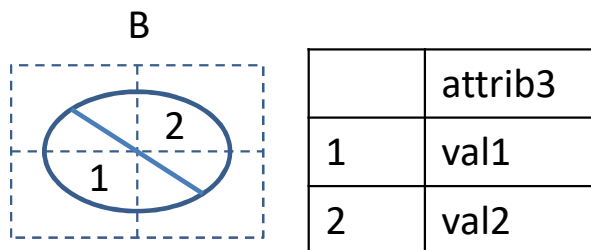
This is not spatial analysis.



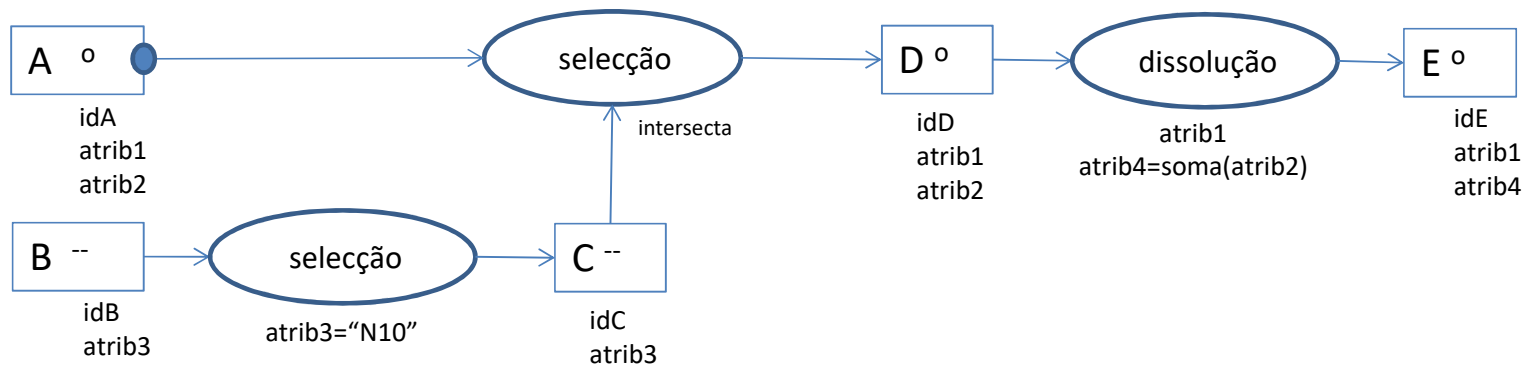
A

1	2
3	4

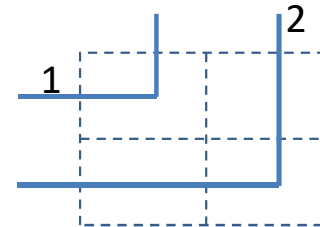
	attrib1	attrib2
1	X	4
2	X	8
3	X	11
4	Y	11



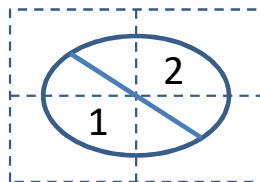
	attrib1
1	X
2	Y



1	2
3	4

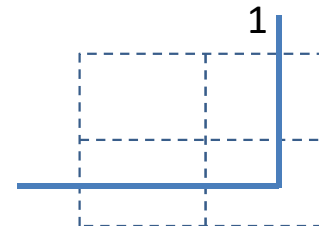


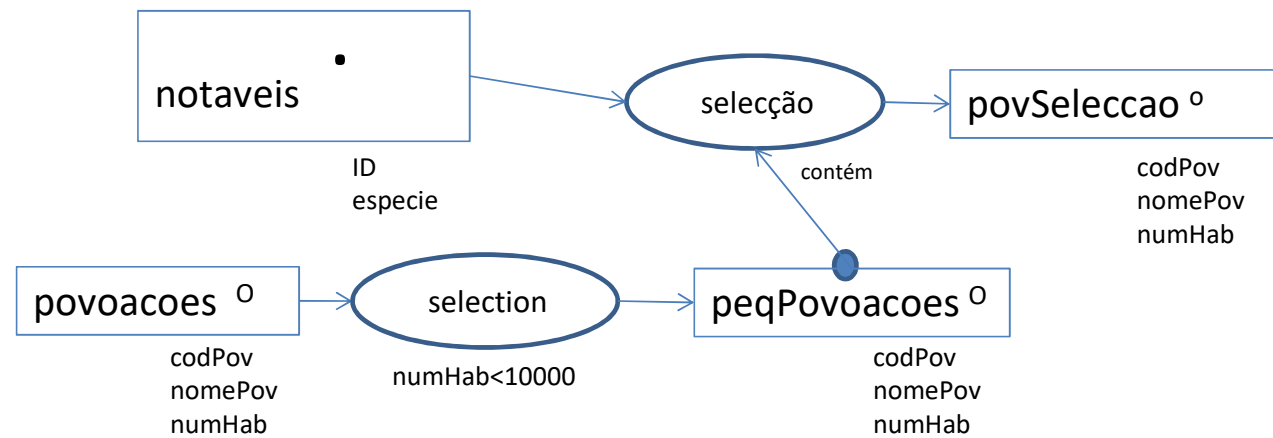
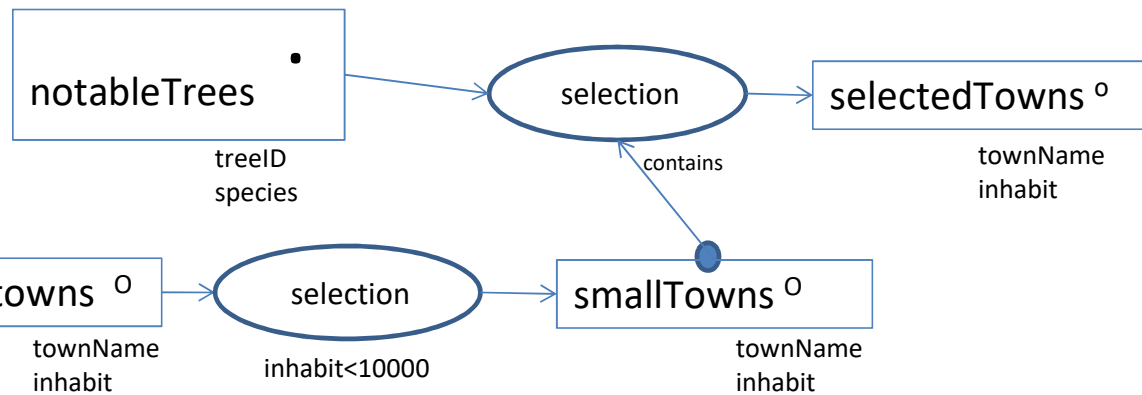
idA	atrib1	atrib2
1	X	4
2	X	3
3	Y	6
4	Y	11

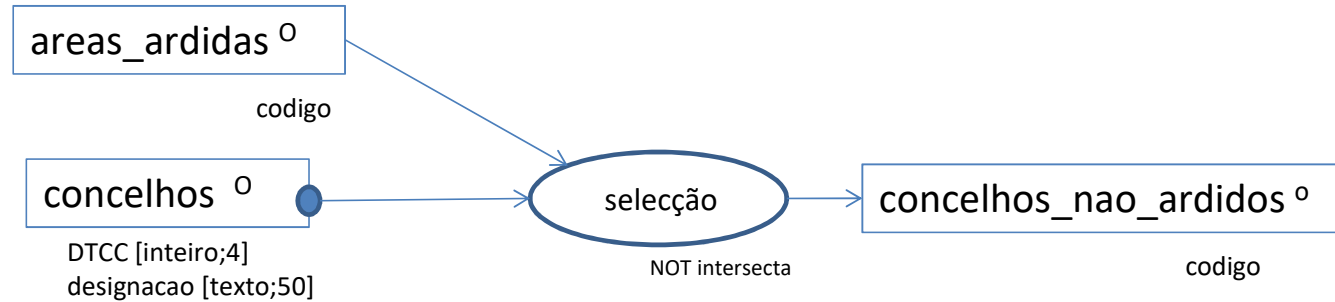
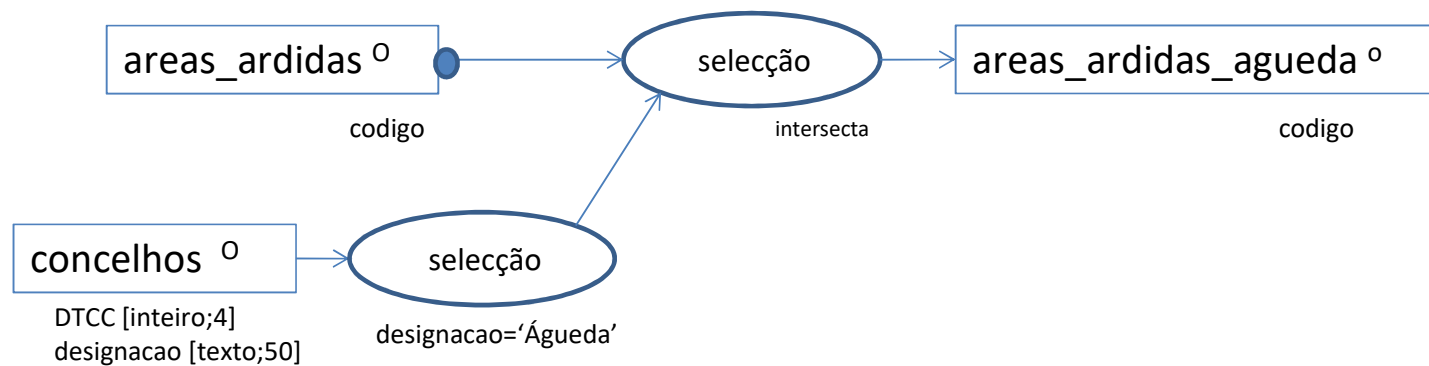


idB	atrib3
1	A1
2	N10

idC	atrib3
1	N10

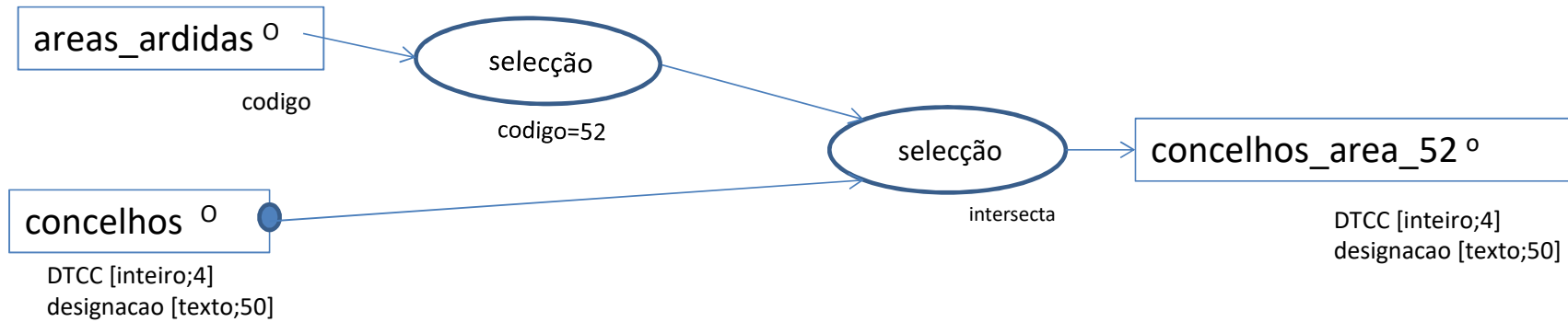




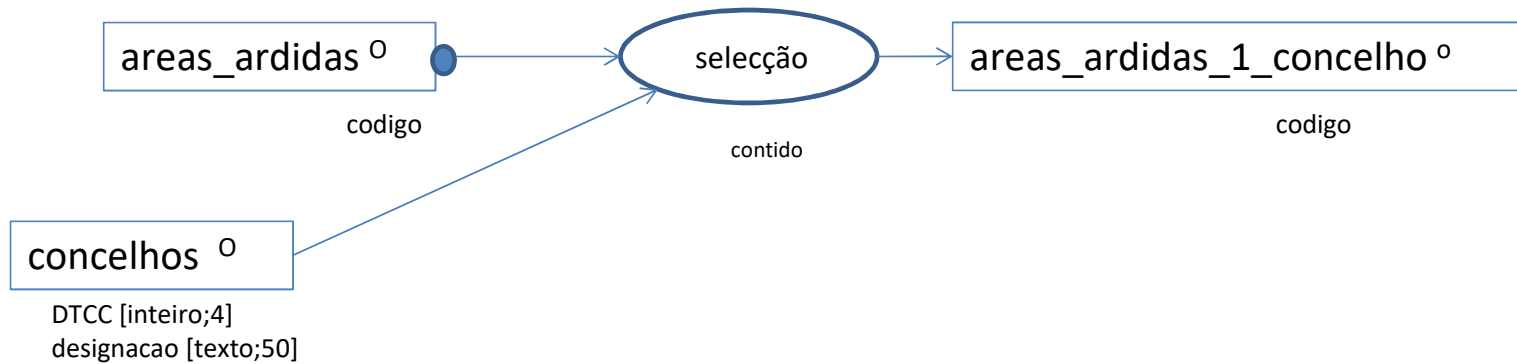


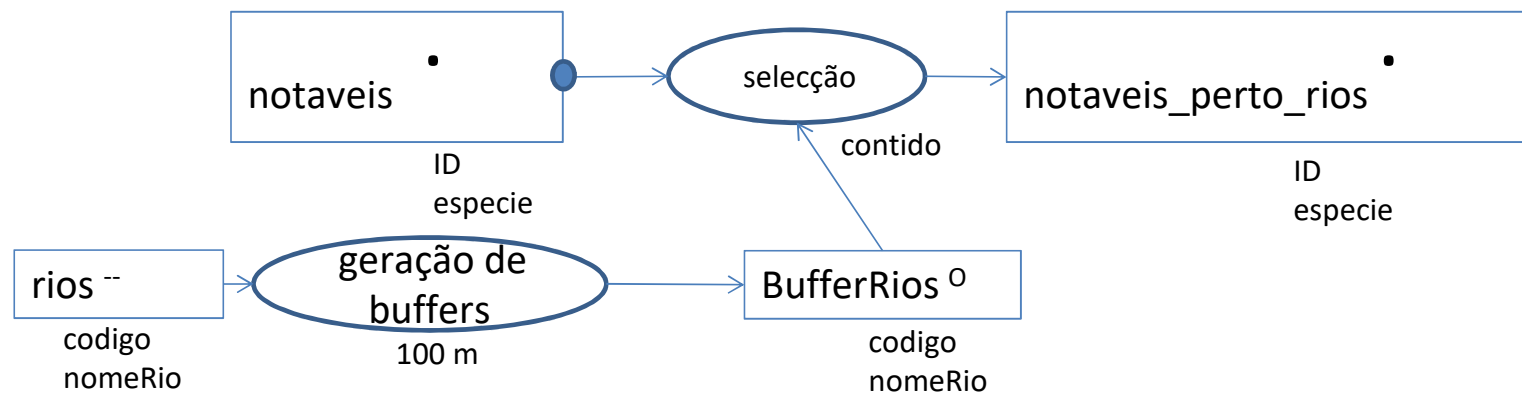
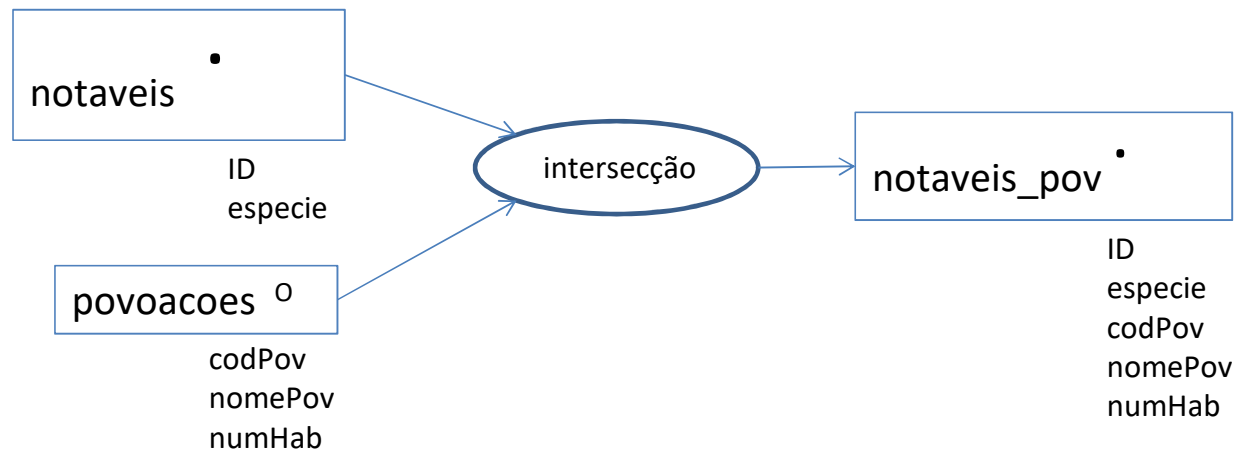
Questões slide 79

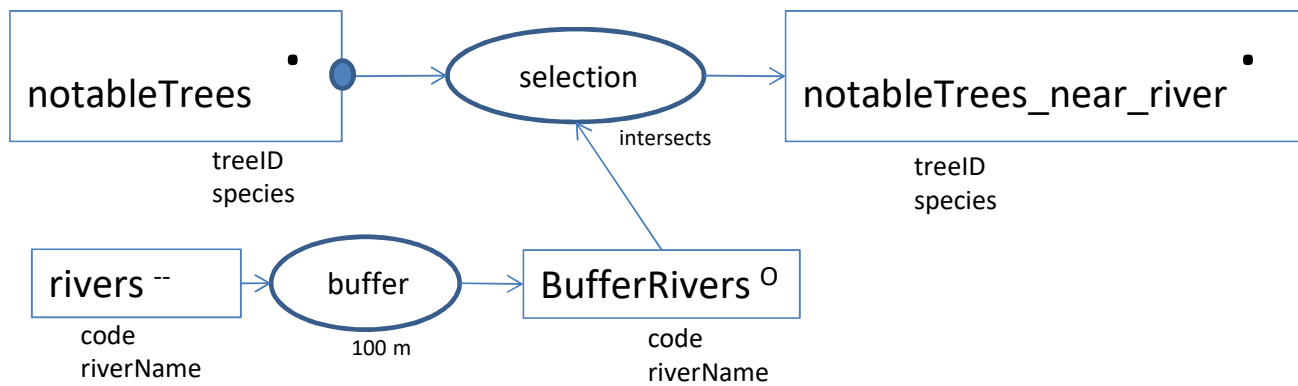
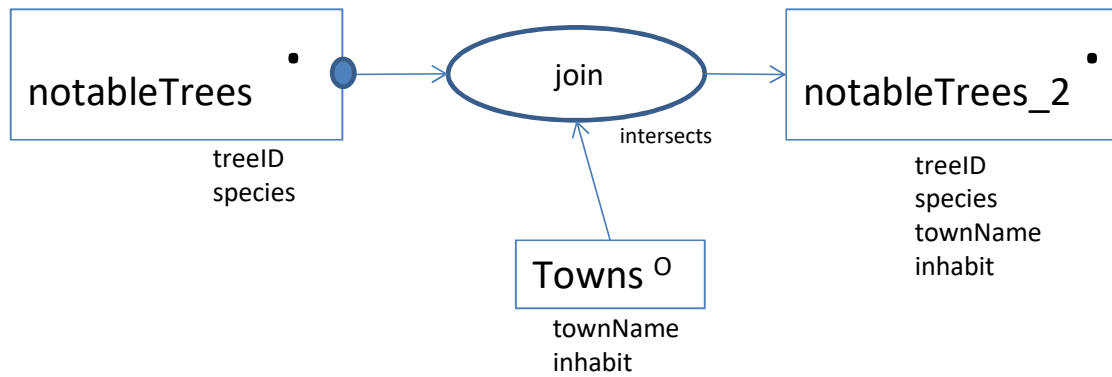
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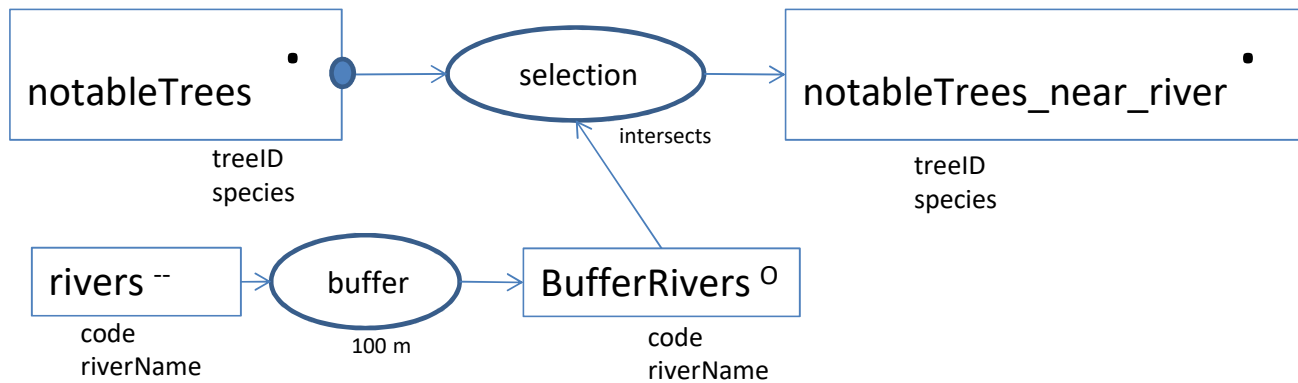
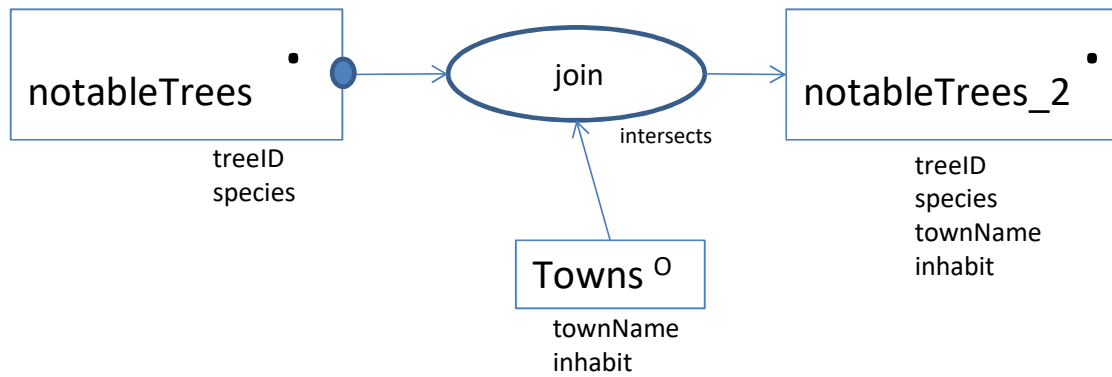


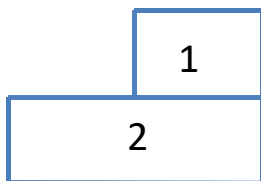
3.



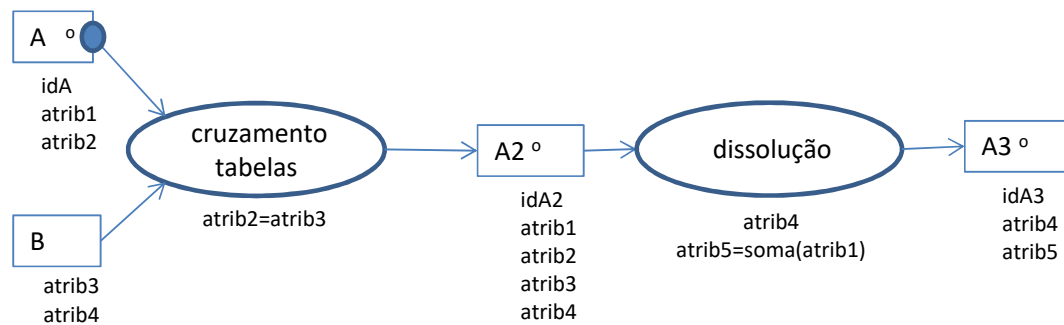
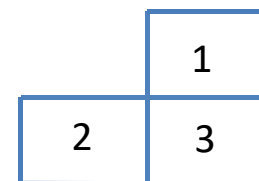


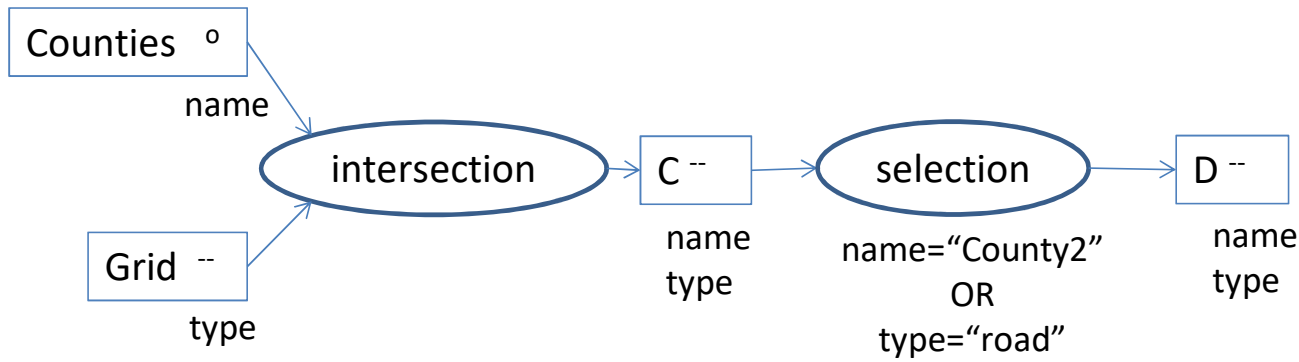






idE	atrib1	atrib4
1	X	3
2	Y	17



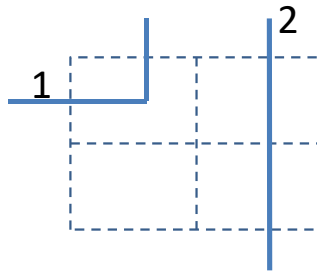


Counties

1	2
3	4

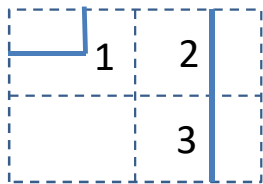
	name
1	County1
2	County1
3	County1
4	County2

Grid



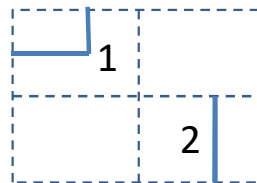
	type
1	road
2	highway

C

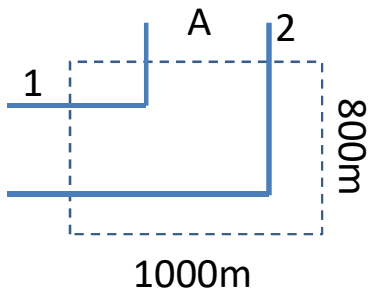
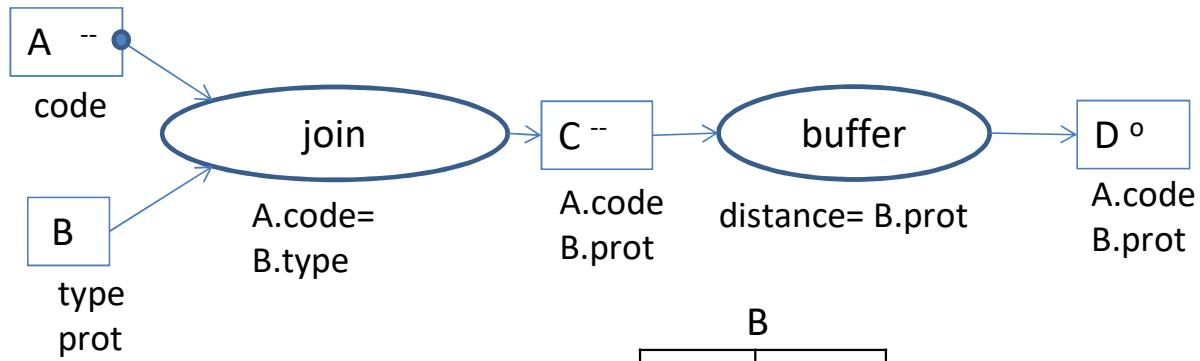


	name	type
1	County1	road
2	County1	highway
3	County2	highway

D

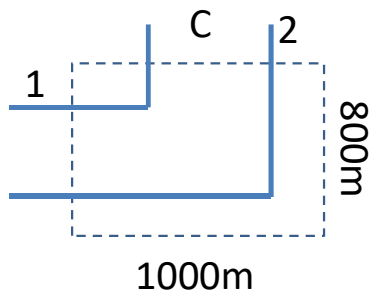


	name	type
1	County1	road
2	County2	highway

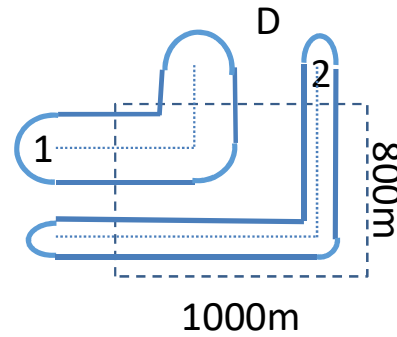


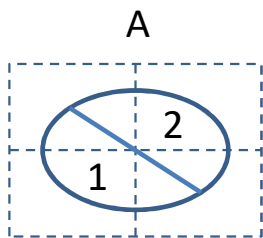
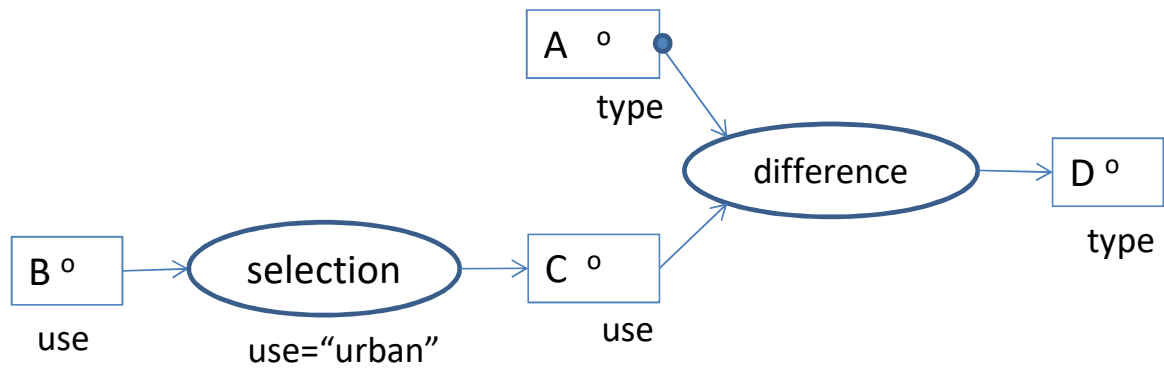
	code
1	M
2	S

B	
type	prot
T	50
M	200
Q	25
S	100

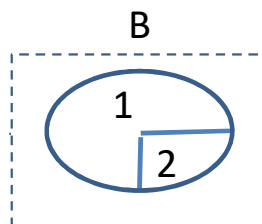


	A.code	B.prot
1	M	200
2	S	100

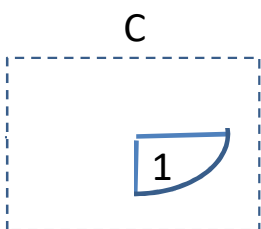




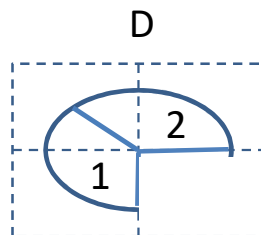
	type
1	sandy
2	clay



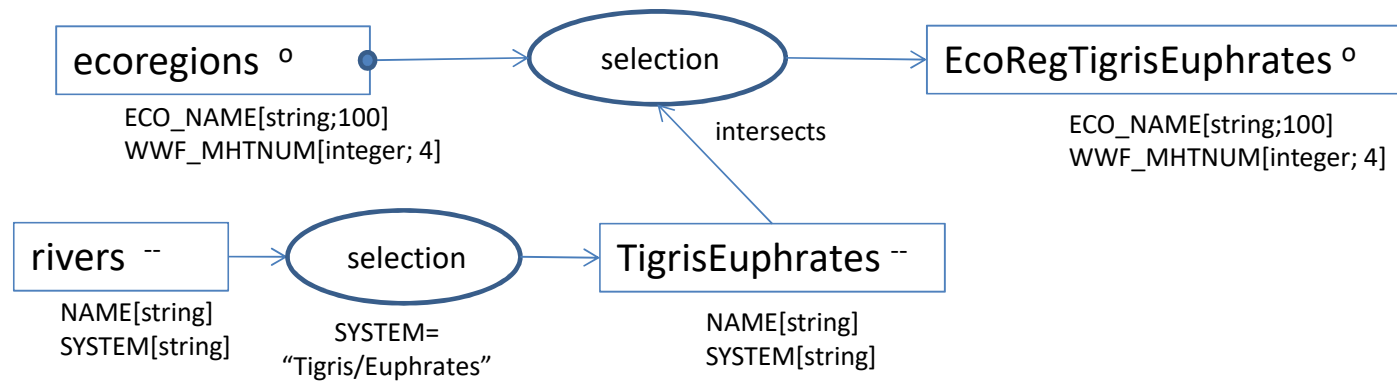
	use
1	farmland
2	urban



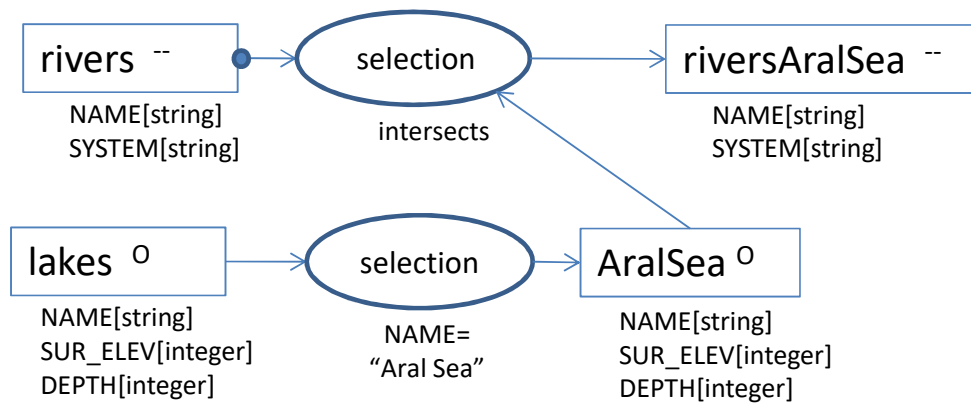
	use
1	urban



	type
1	sandy
2	clay

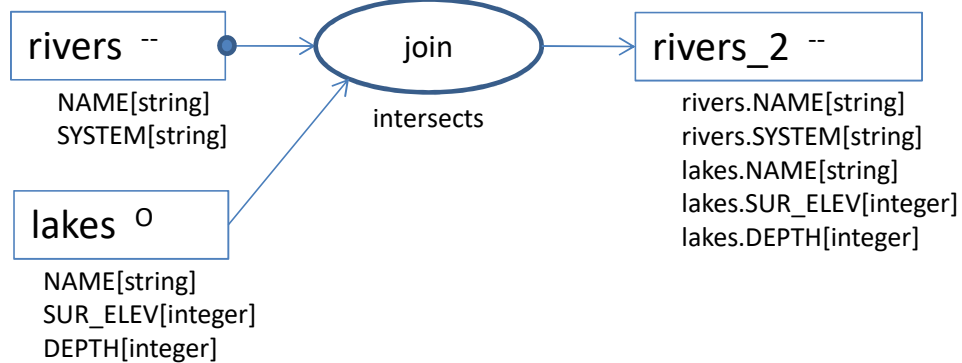
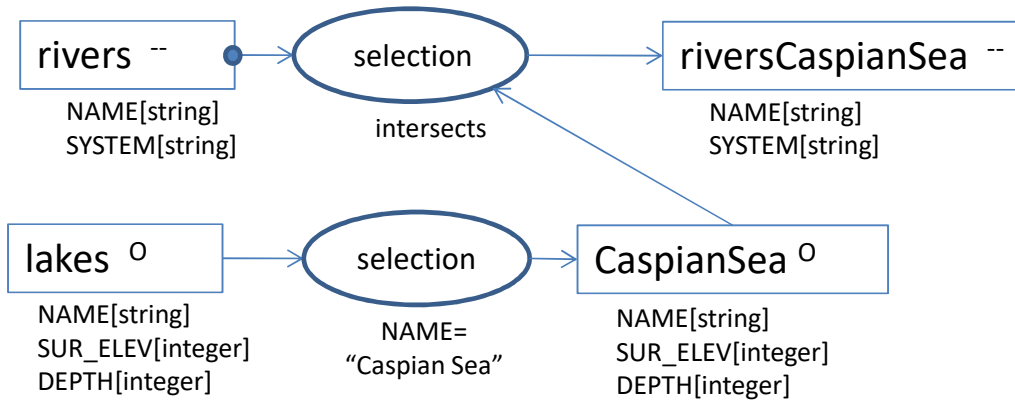


diagram_tigris_euphrates.JPG

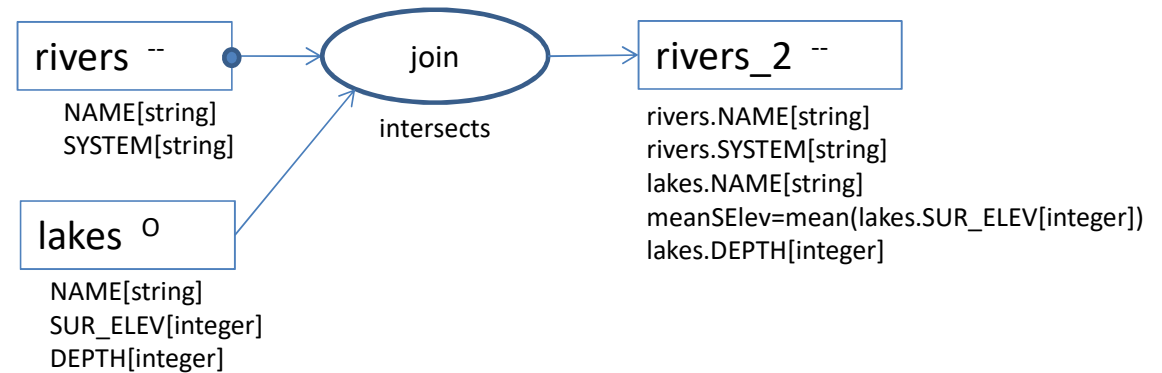


diagram_aral_sea.JPG

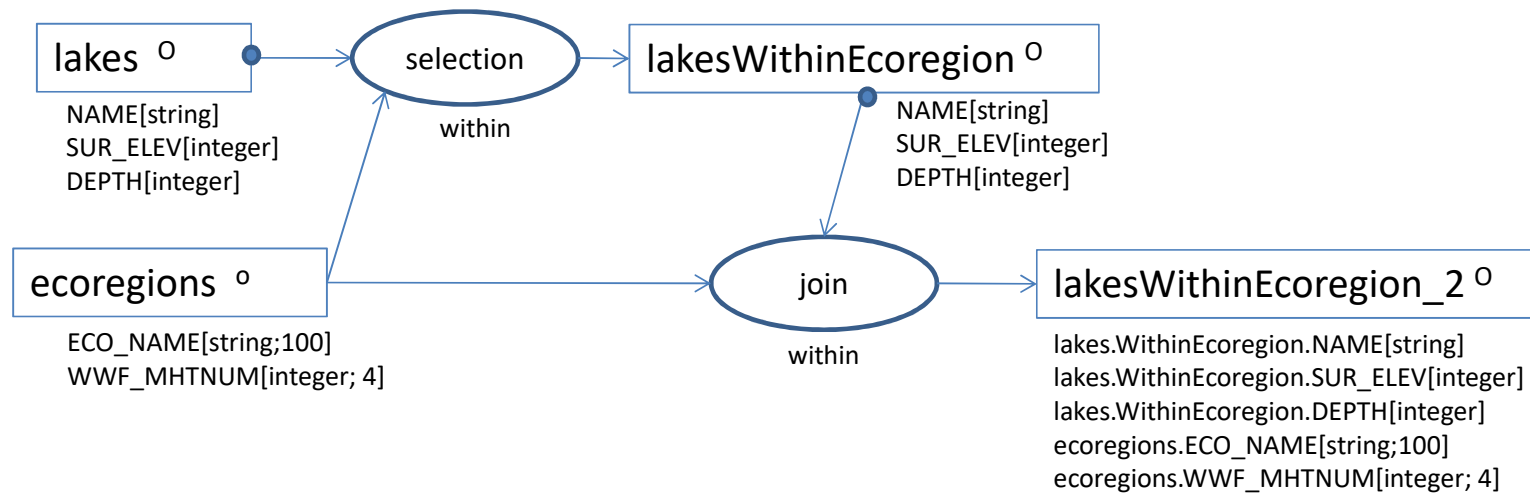
diagram_caspian_sea.JPG



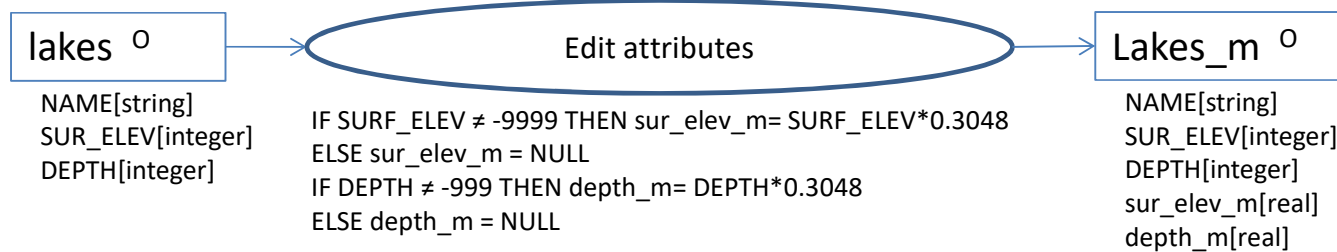
diagram_rivers_spatial_join_lakes.JPG



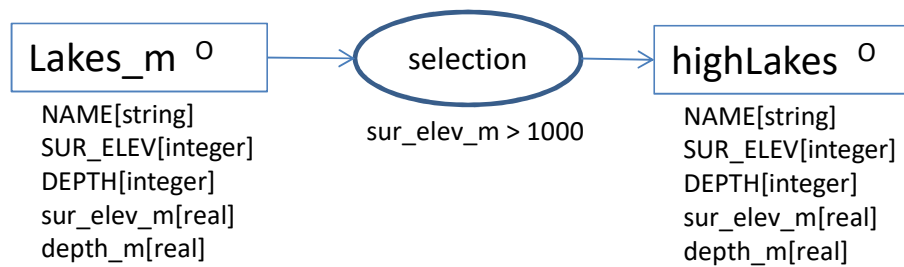
diagram_spatial_join_mean_elevation.JPG



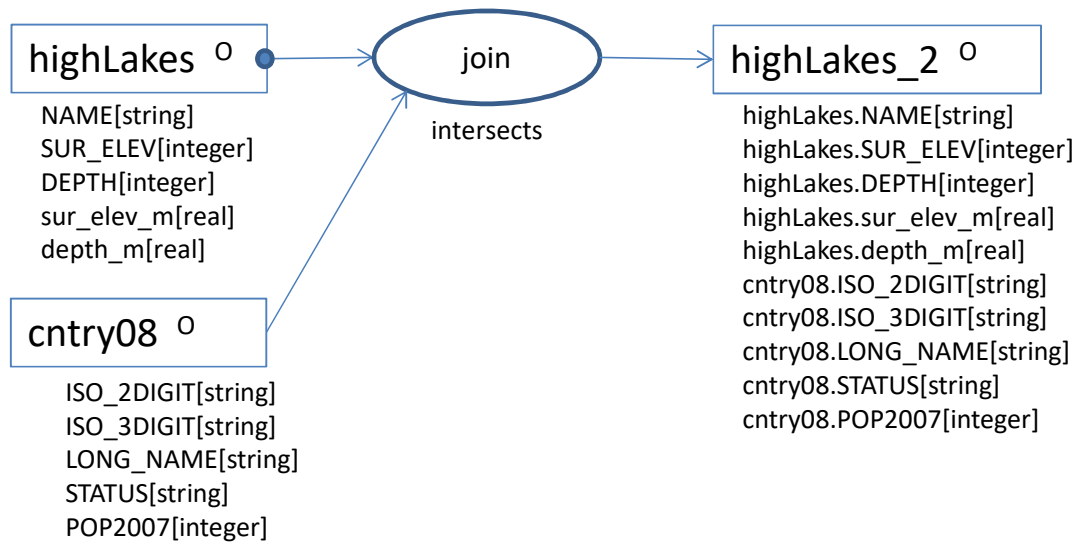
diagram_lakes_within_biome.JPG



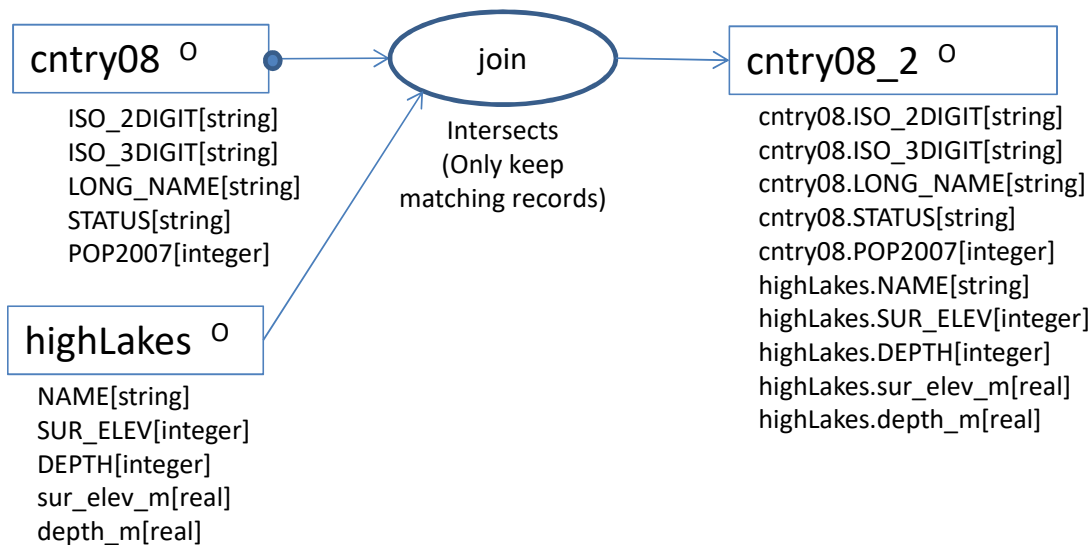
diagram_lakes_feet_to_meters.JPG



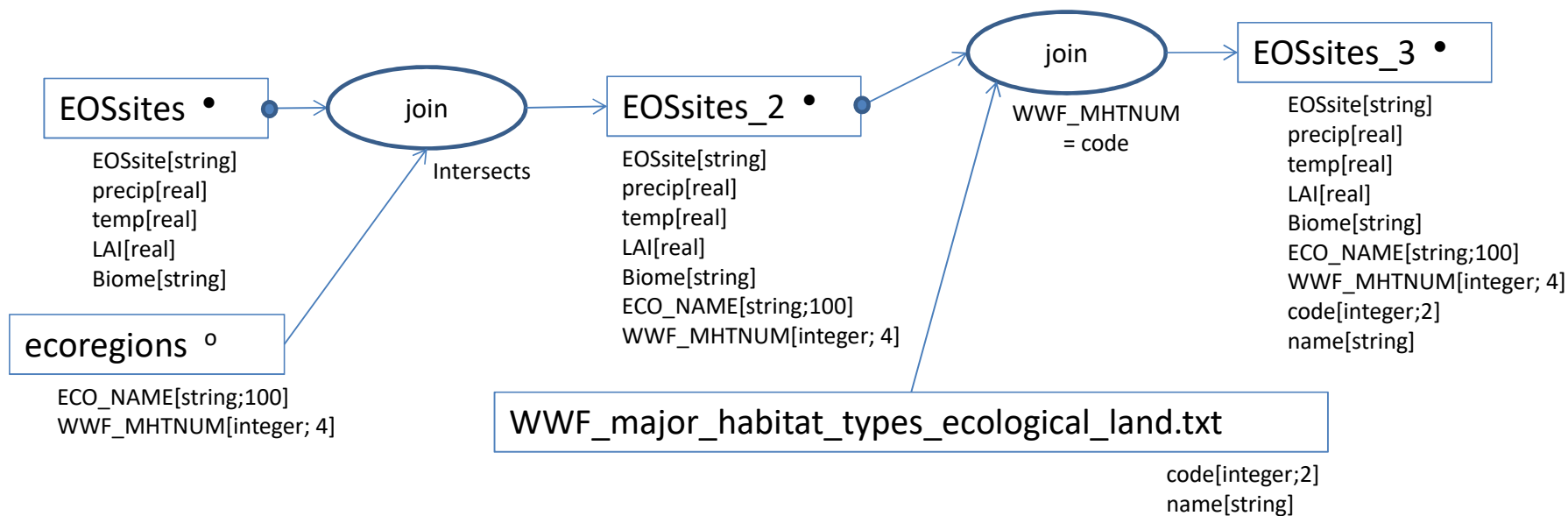
diagram_high_lakes.JPG



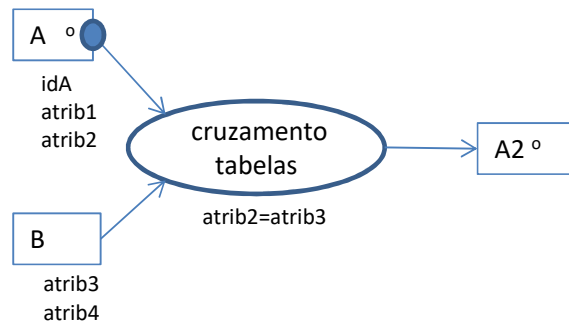
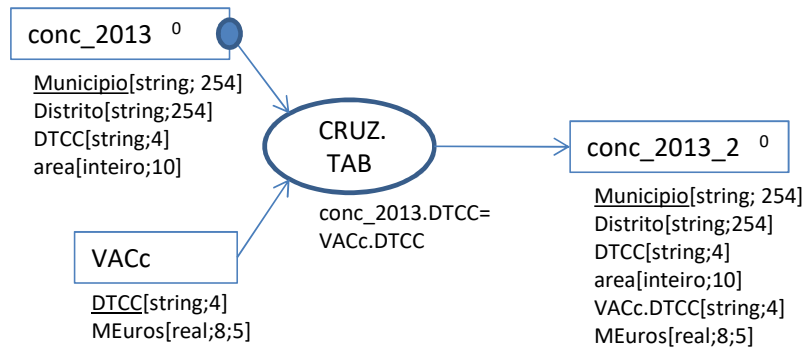
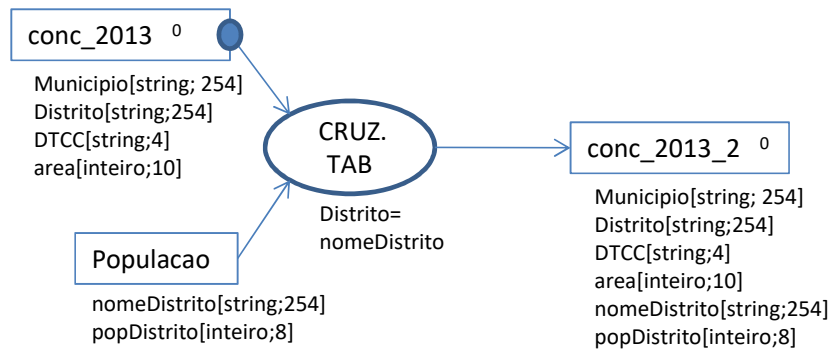
diagram_highlakes_join_countries.JPG

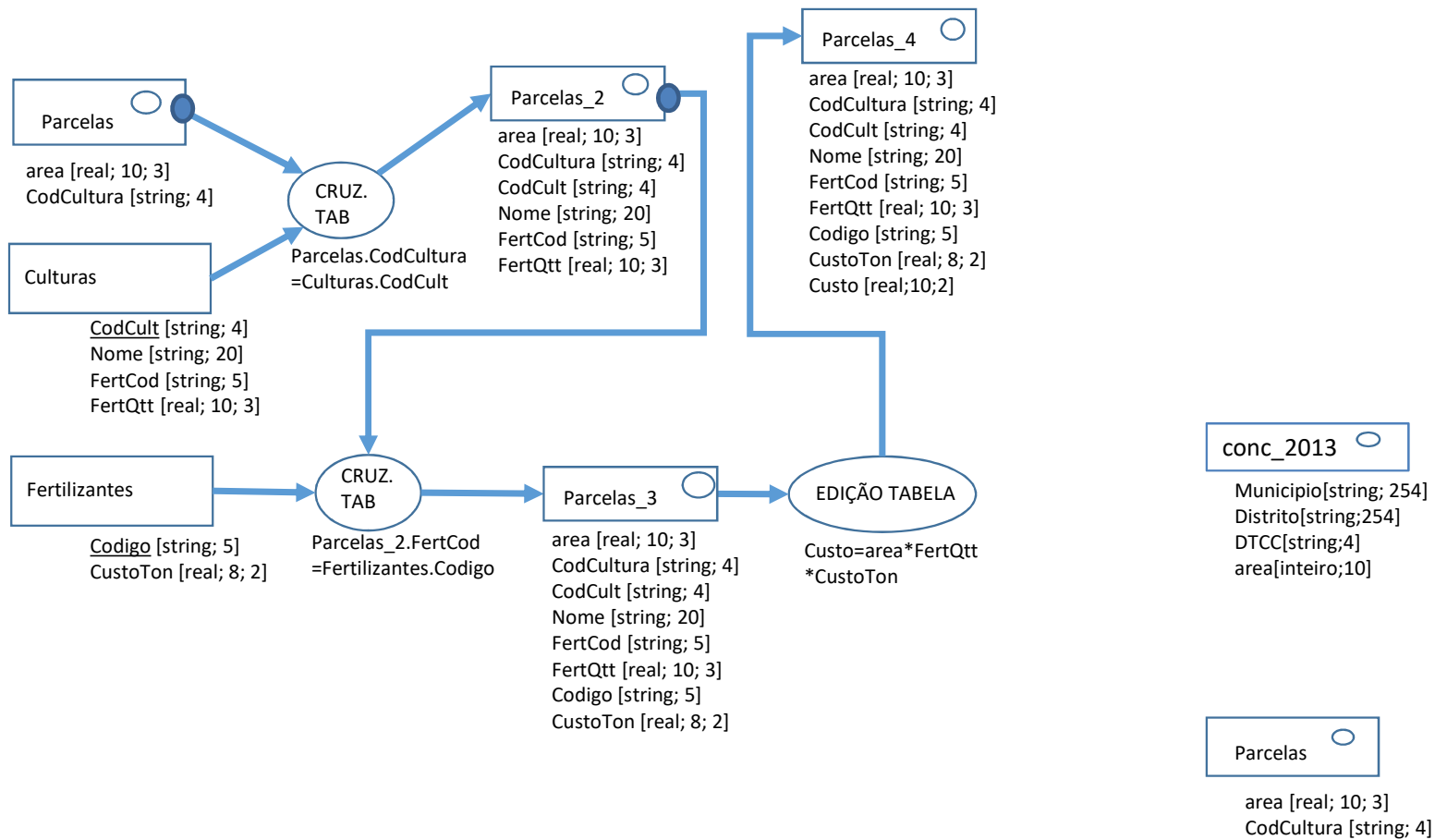


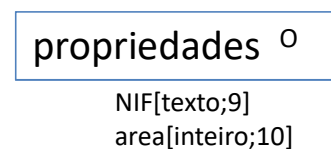
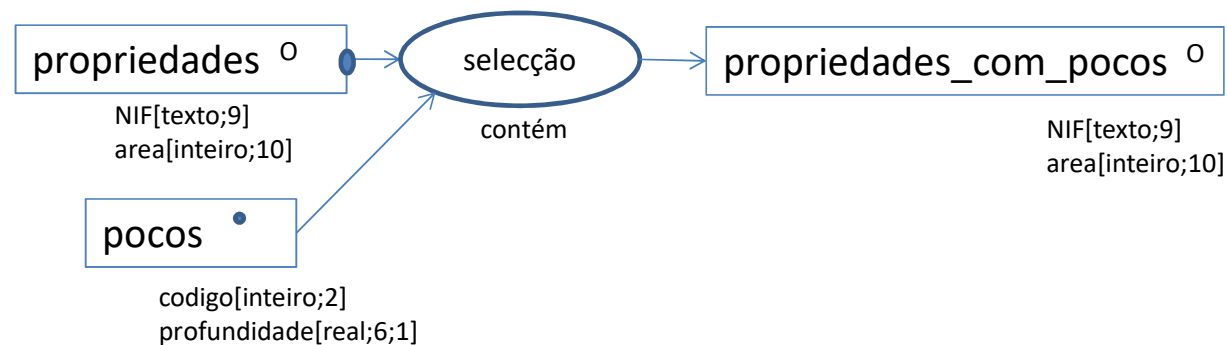
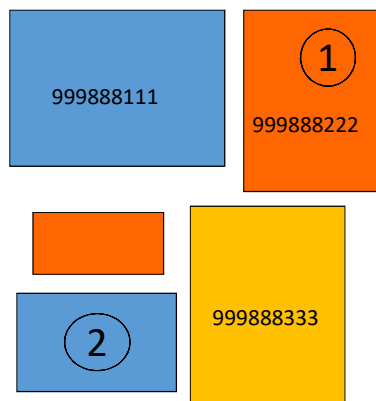
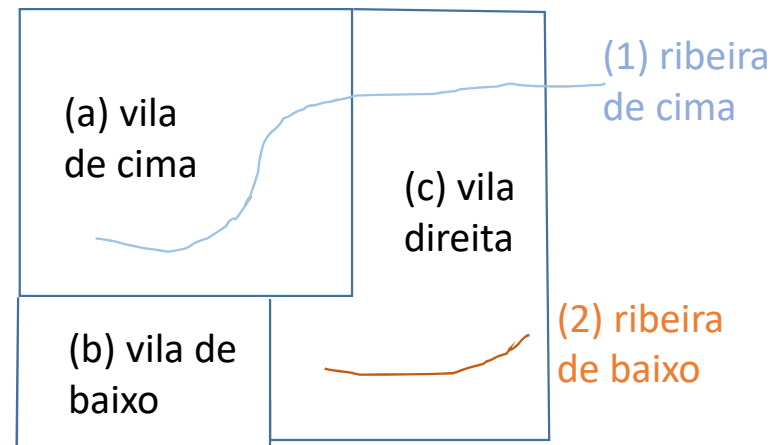
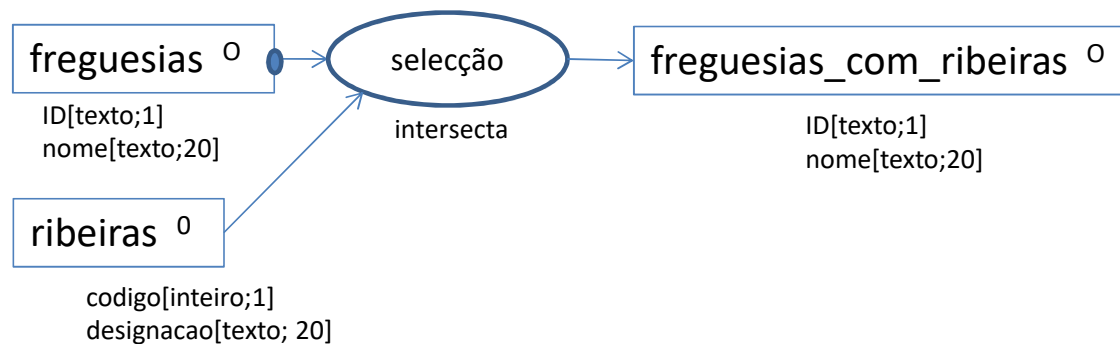
diagram_countries_join_highlakes.JPG



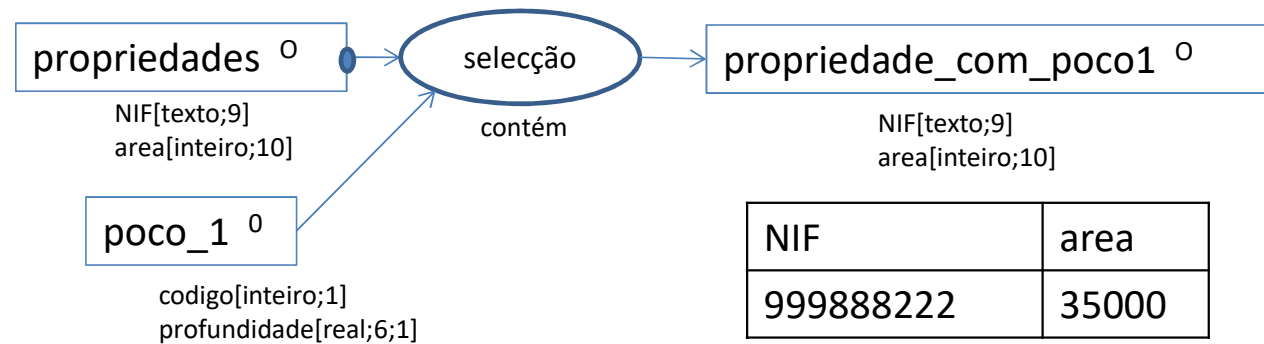
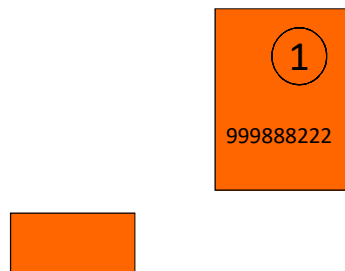
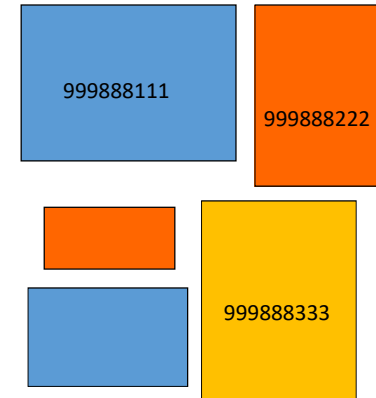
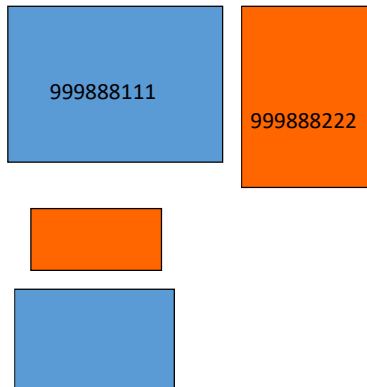
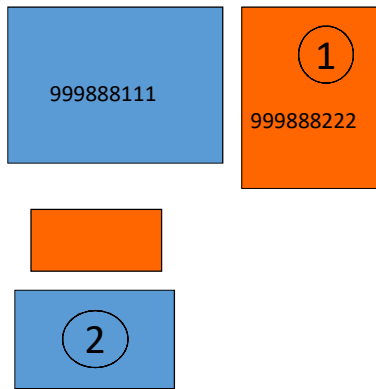
diagram_eos_join_ecoregions.JPG





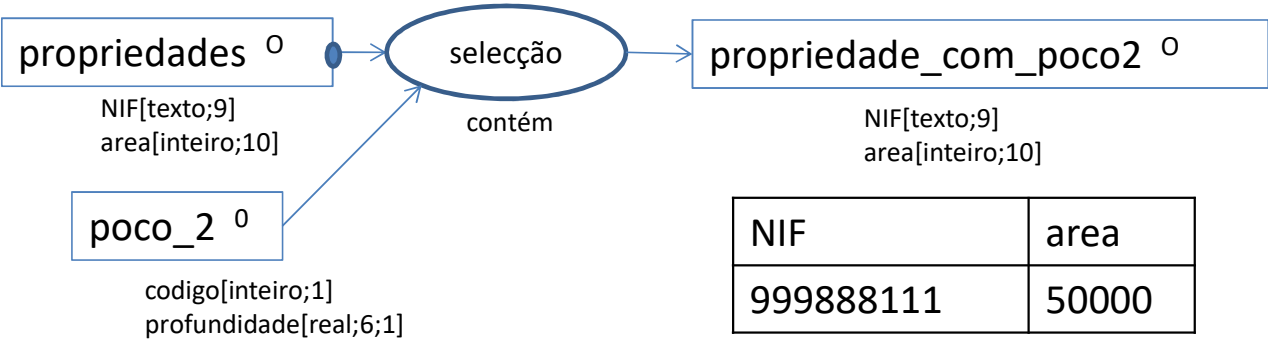


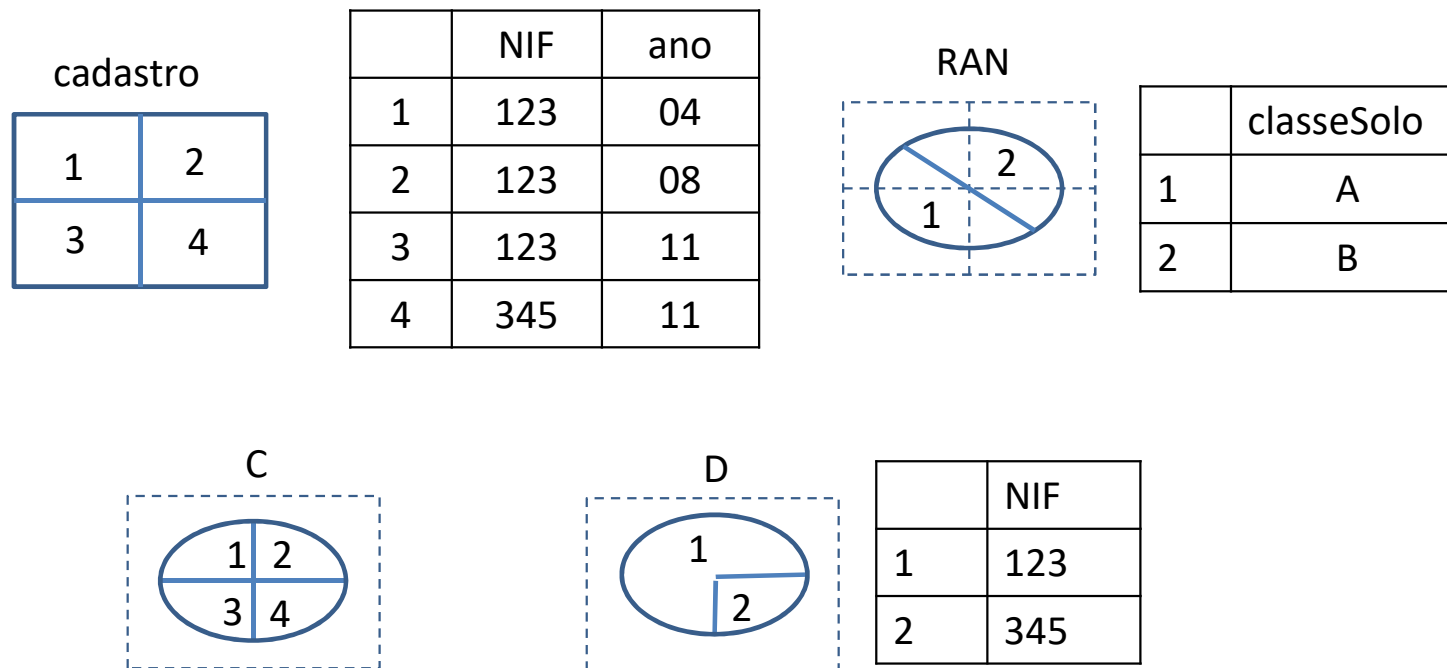
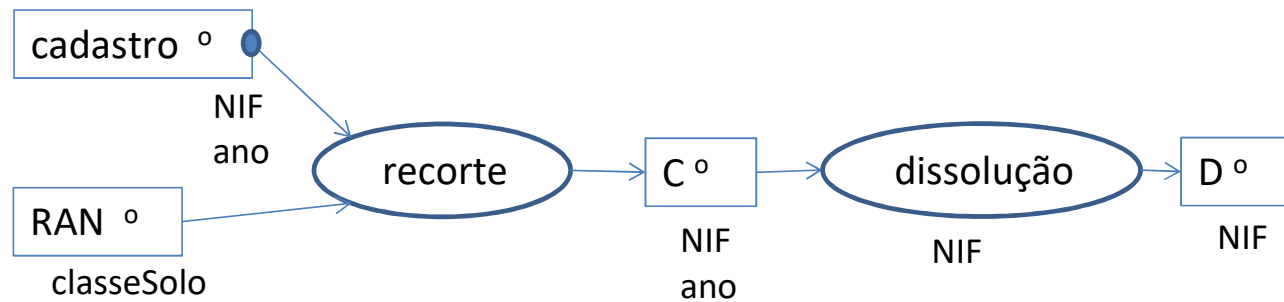
NIF	area
999888111	50000
999888222	35000

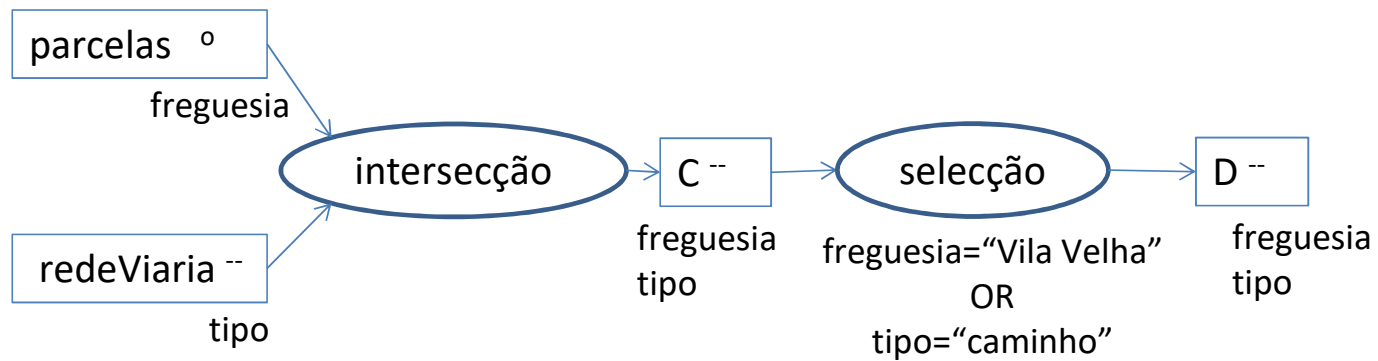


999888111

2



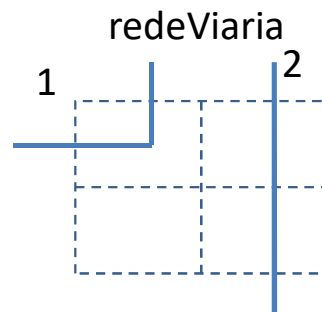




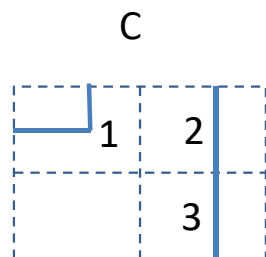
parcelas

1	2
3	4

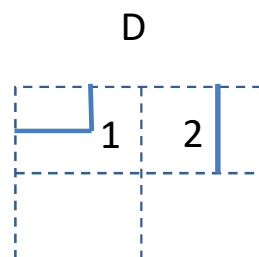
	freguesia
1	Vila Velha
2	Vila Velha
3	Vila Velha
4	Vila Nova



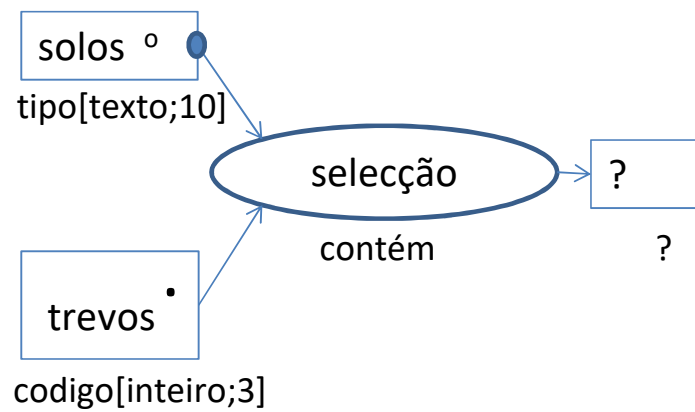
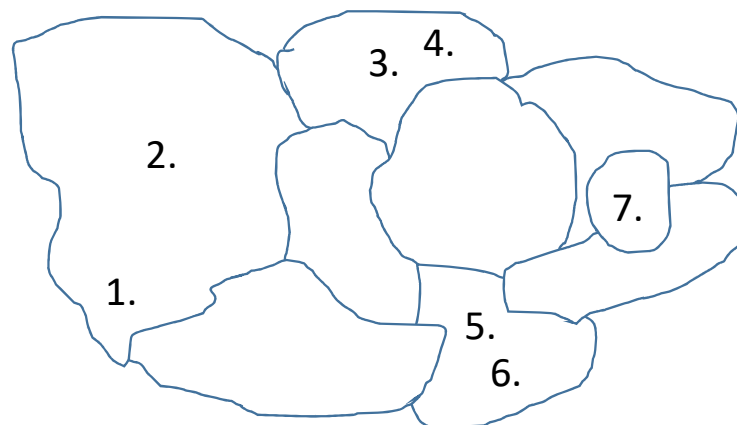
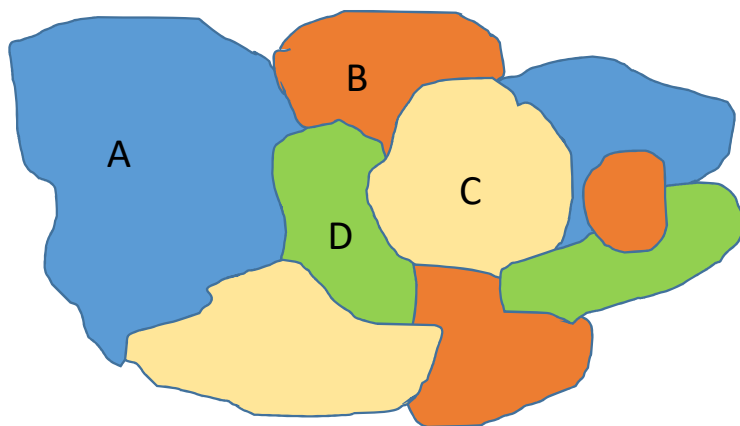
	tipo
1	caminho
2	estrada

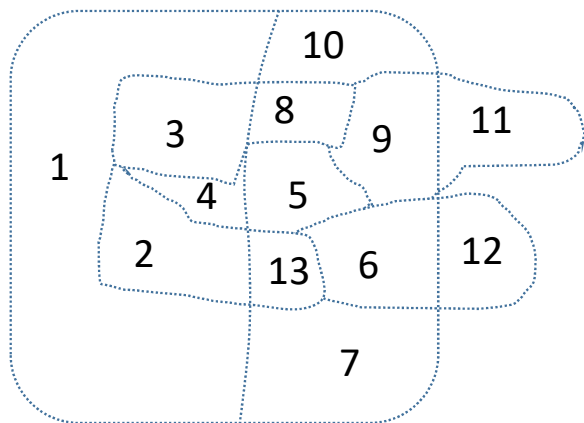
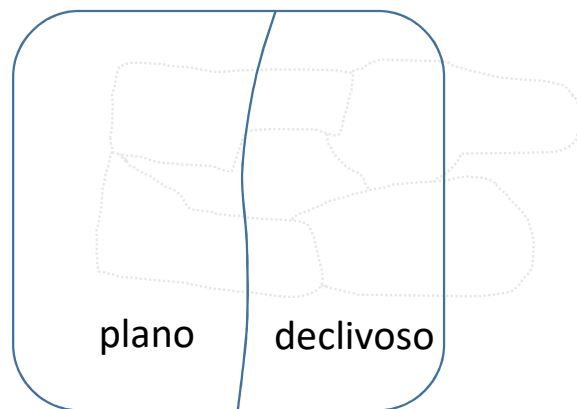
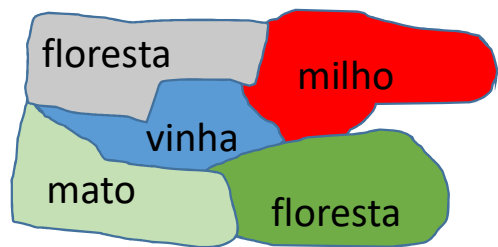


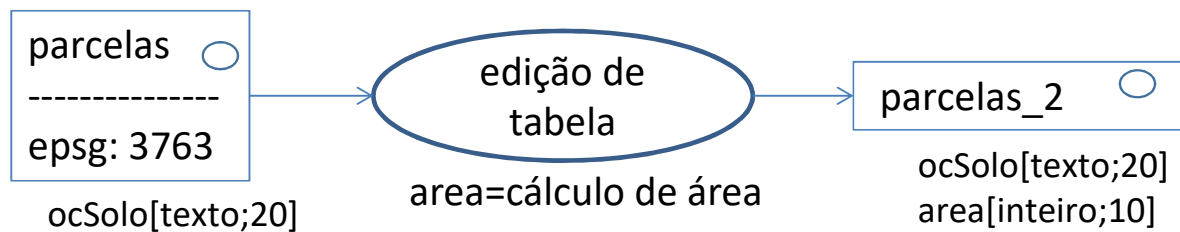
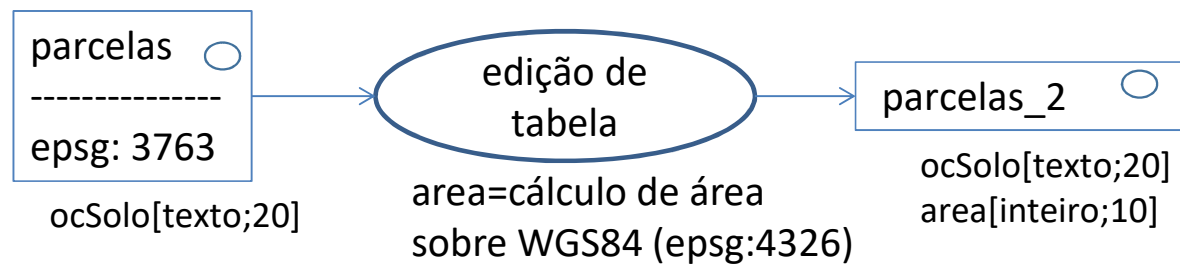
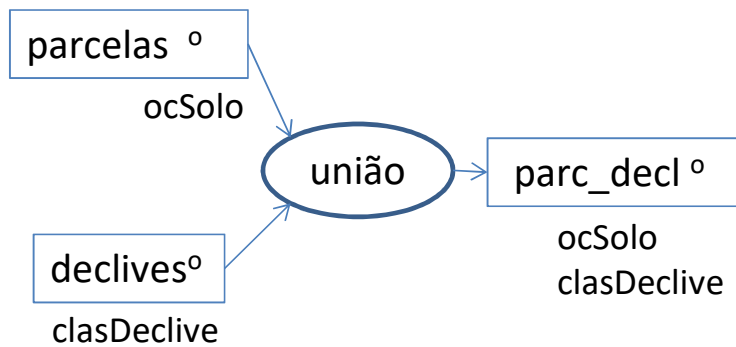
	freguesia	tipo
1	Vila Velha	caminho
2	Vila Velha	estrada
3	Vila Nova	estrada

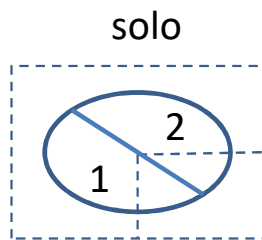
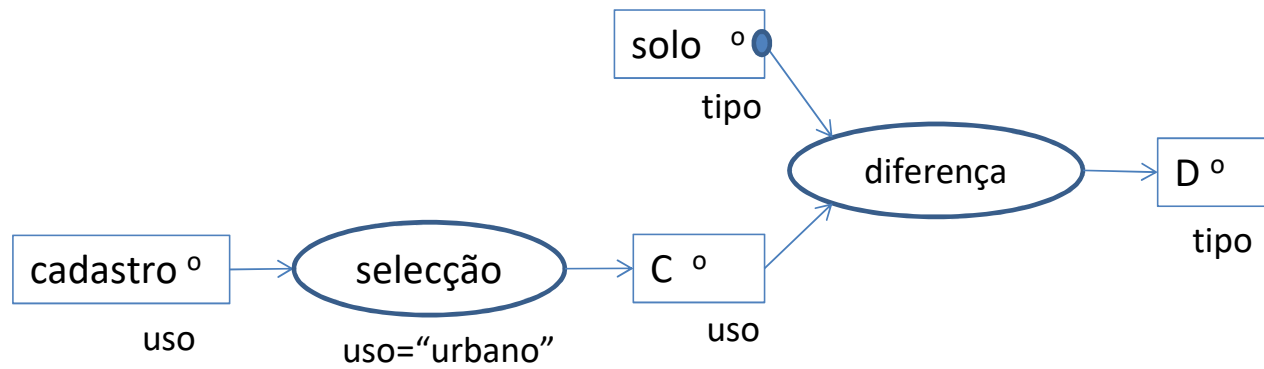


	freguesia	tipo
1	Vila Velha	caminho
2	Vila Velha	estrada

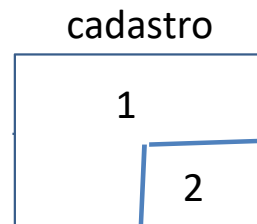




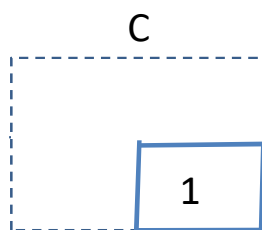




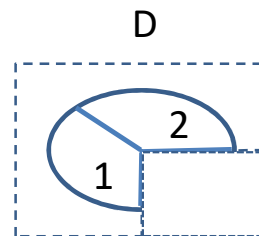
	tipo
1	arenoso
2	argiloso



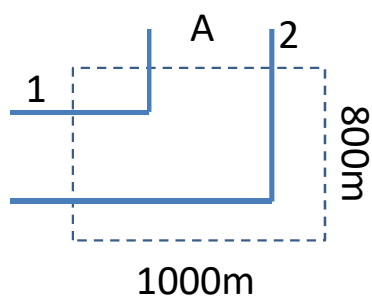
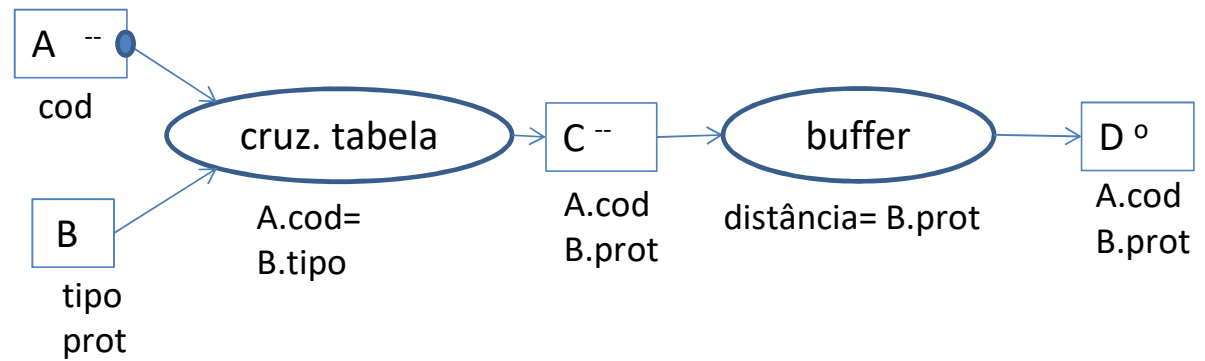
	uso
1	agrícola
2	urbano



	uso
1	urbano

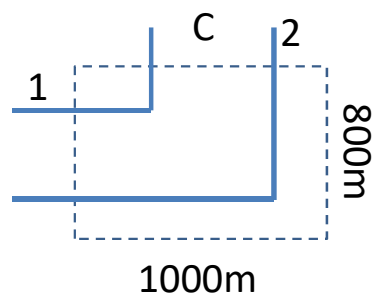


	tipo
1	arenoso
2	argiloso

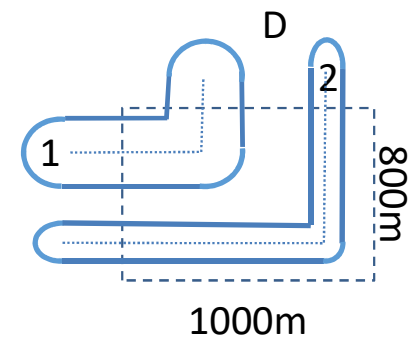


	cod
1	M
2	S

B	
tipo	prot
T	50
M	200
Q	25
S	100



	A.cod	B.prot
1	M	200
2	S	100



propriedades °

artigo[texto;9]
area[inteiro;10]

101345111

101345222

101345333

artigo	area
101345111	50000
101345222	35000
101345333	40000

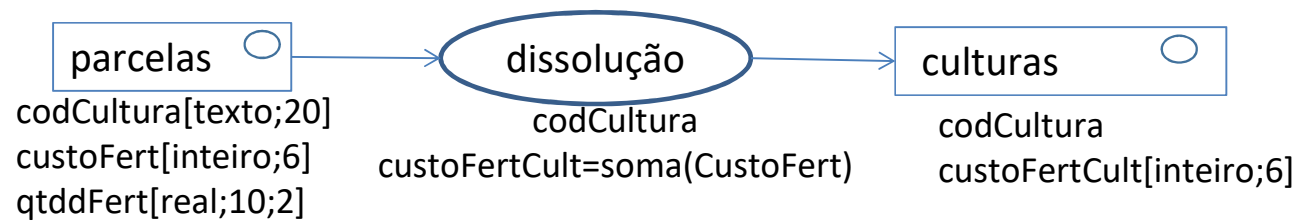
parcelas °

freguesia[texto;50]

parcelas

1	2
3	4

	freguesia
1	Vila Velha
2	Vila Velha
3	Vila Velha
4	Vila Nova



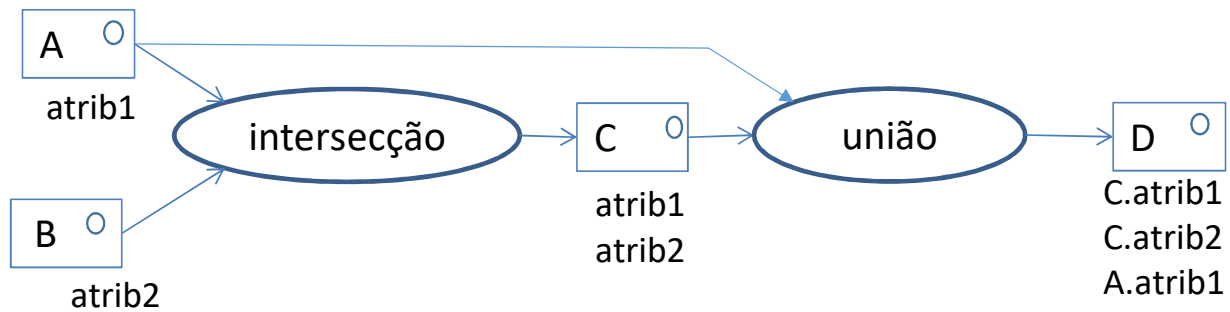
A

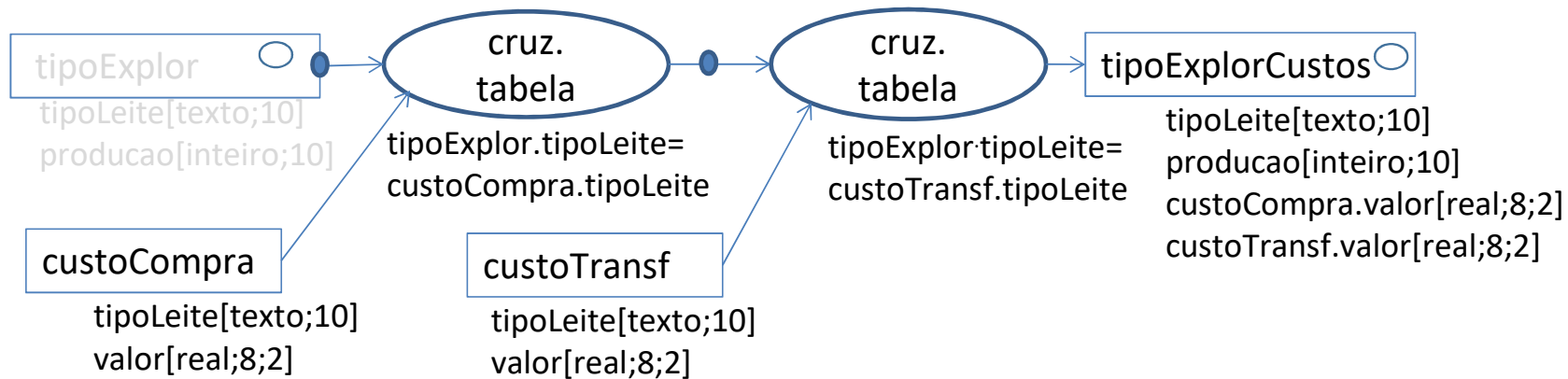
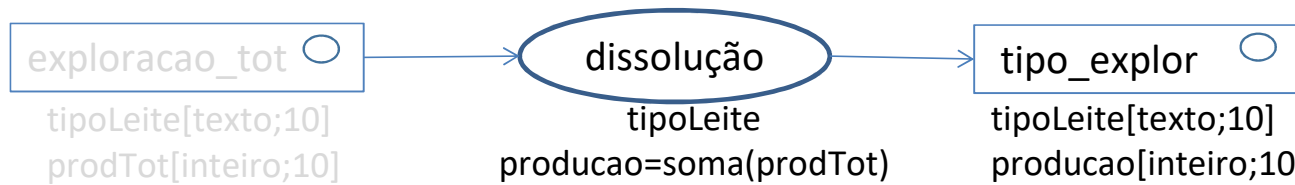
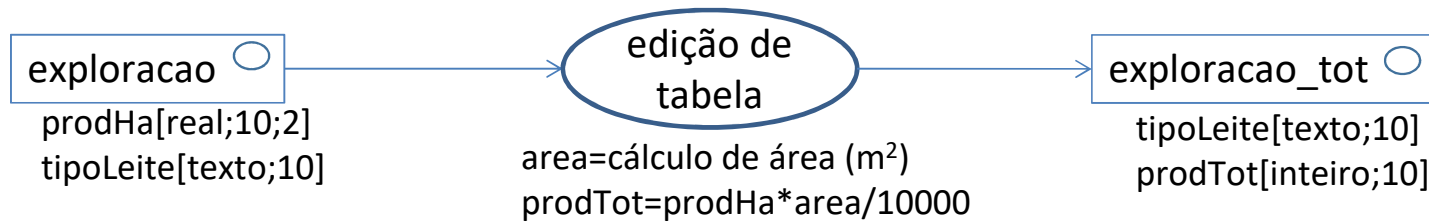
1	2
3	

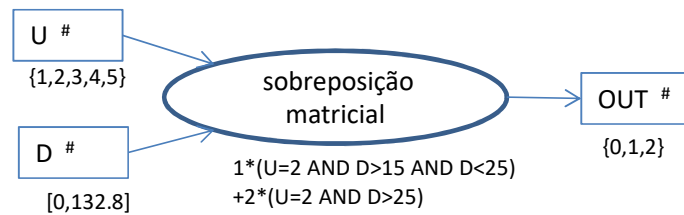
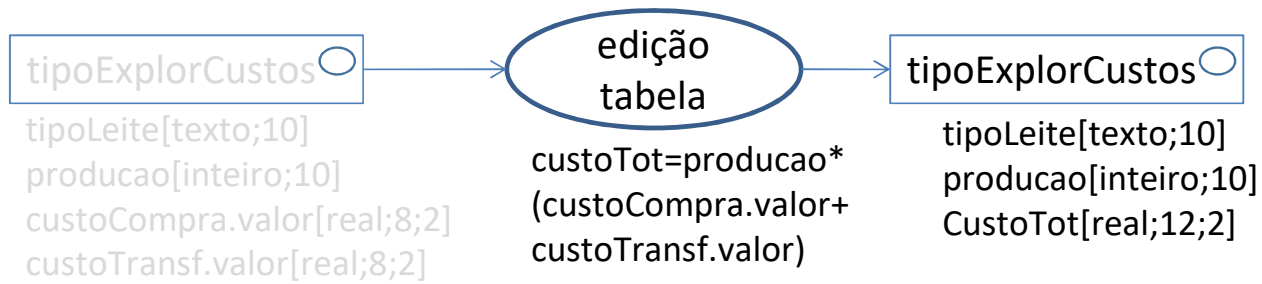
	atrib1
1	a
2	b
3	b

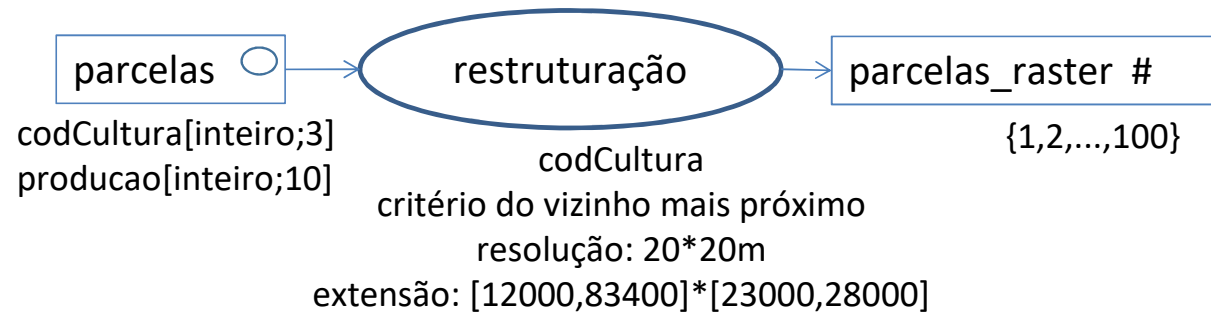
B

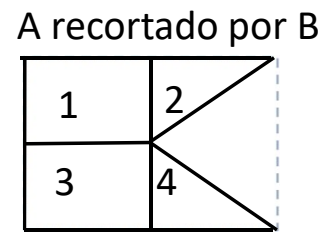
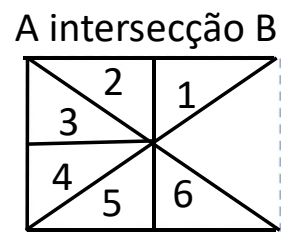
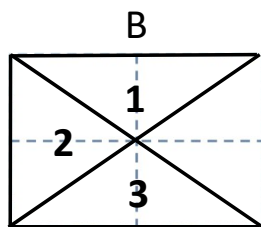
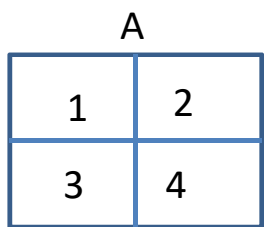
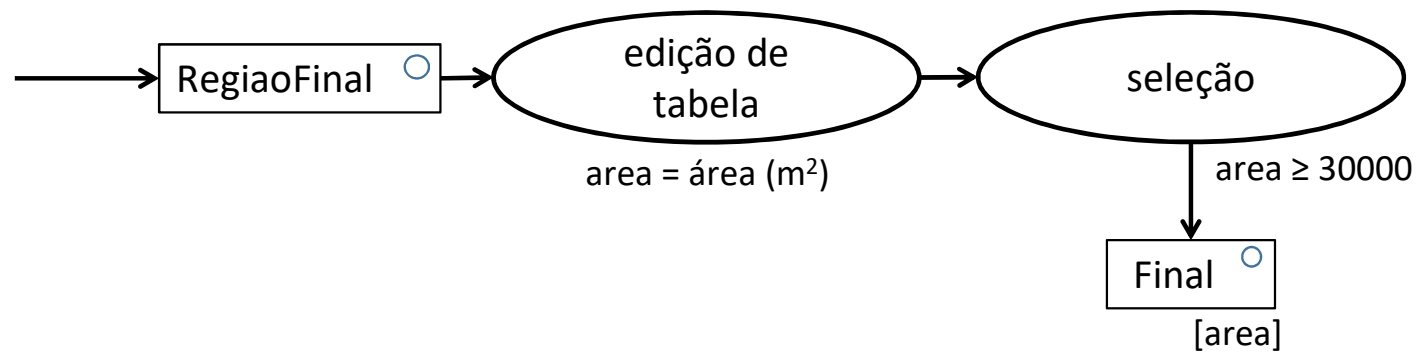
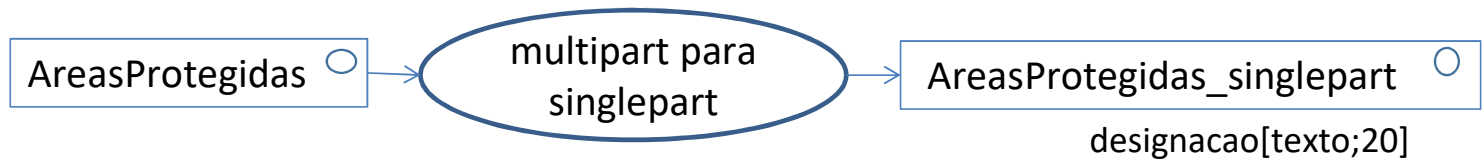
1	10
2	15
3	10



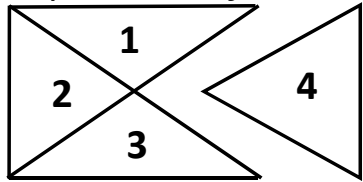




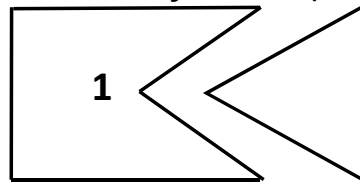




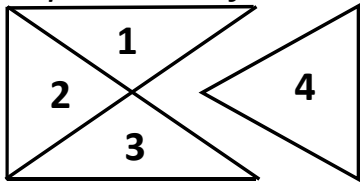
input com 4 features



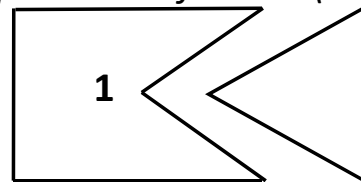
output com 1 feature (multipart)

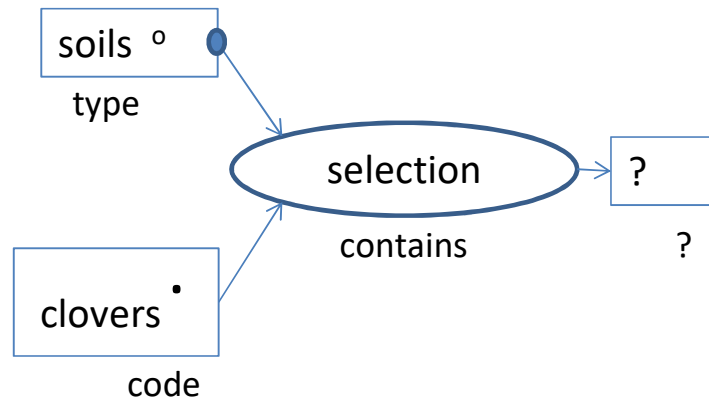
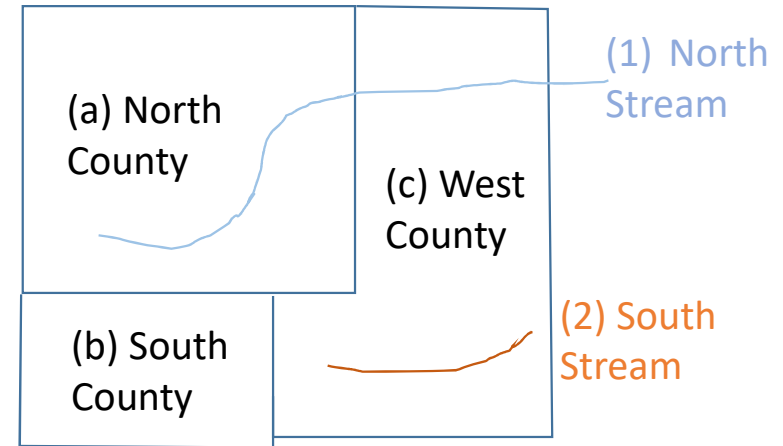
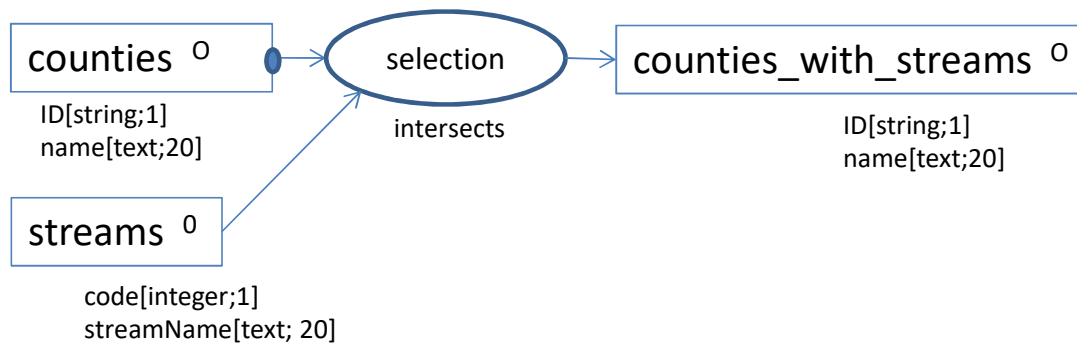


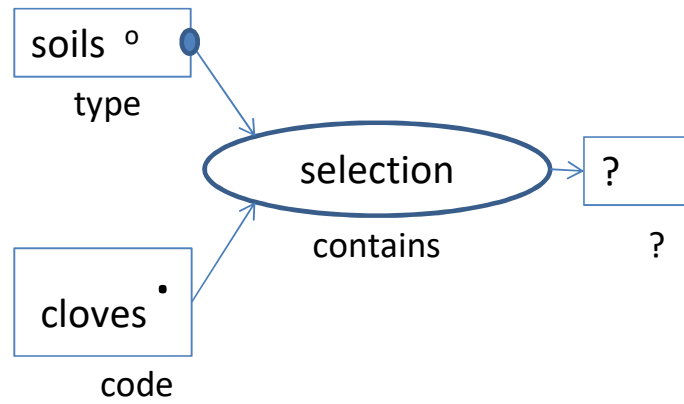
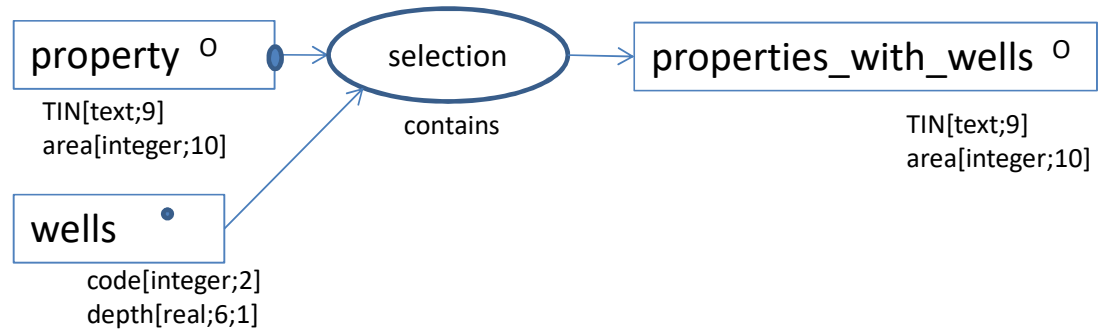
input with 4 features



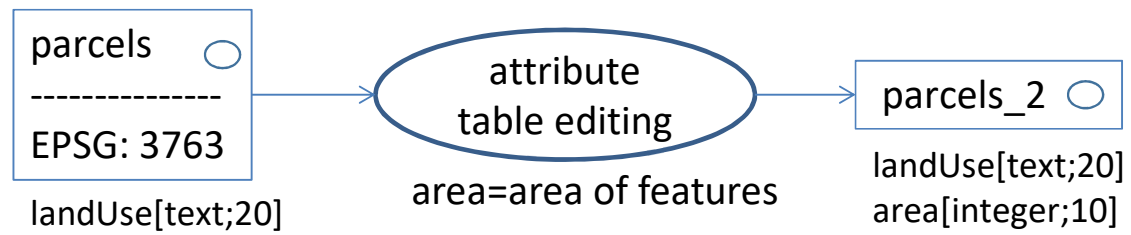
output with 1 feature (multipart)

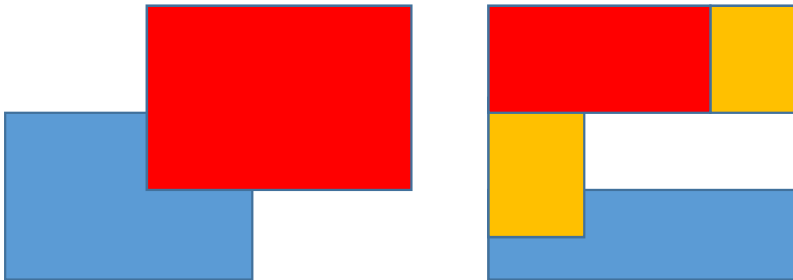
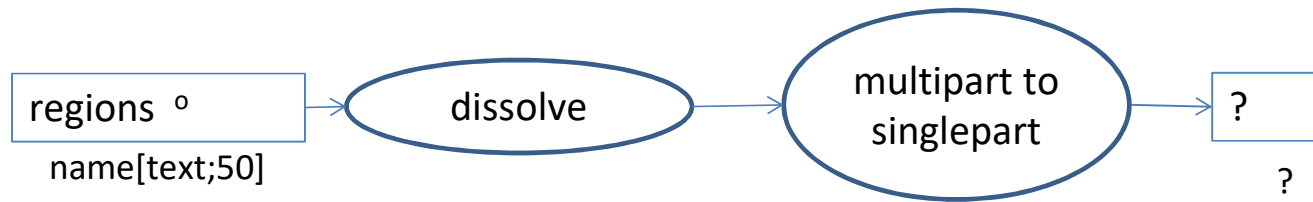
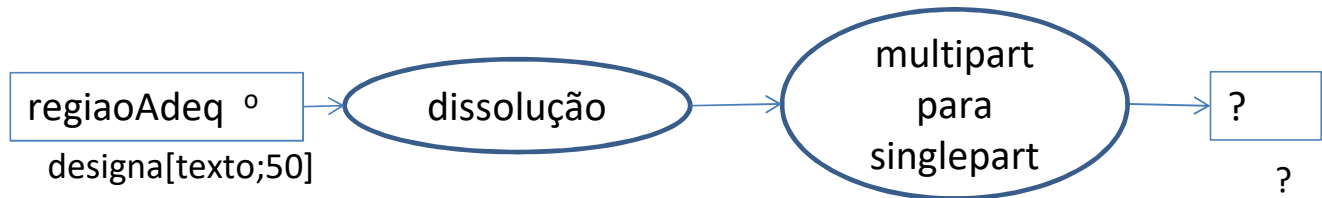


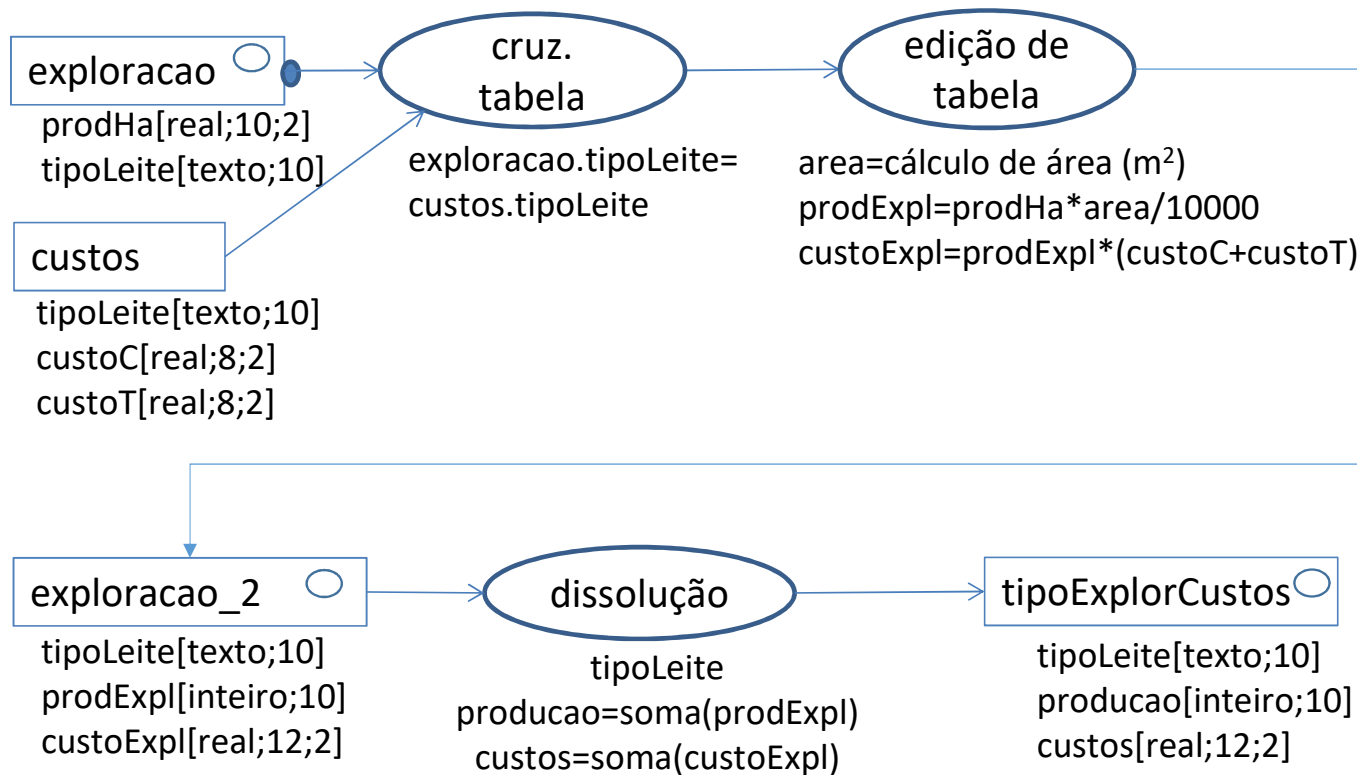




diagram_compute_area_epsg_3763.PNG







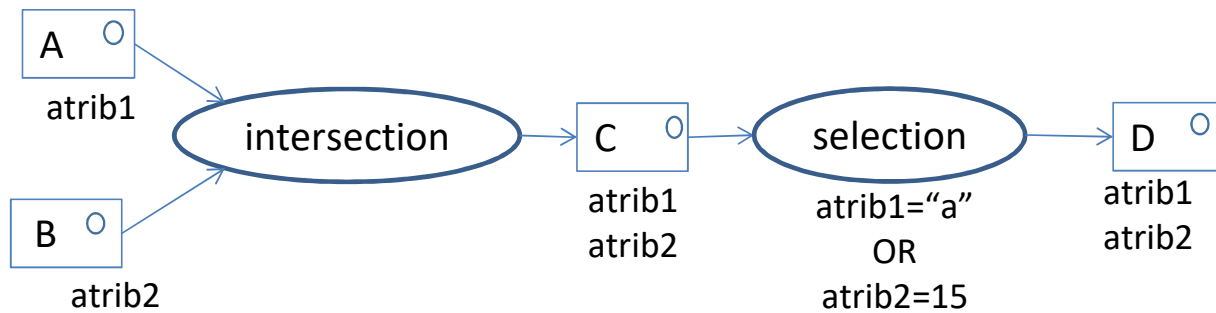
A

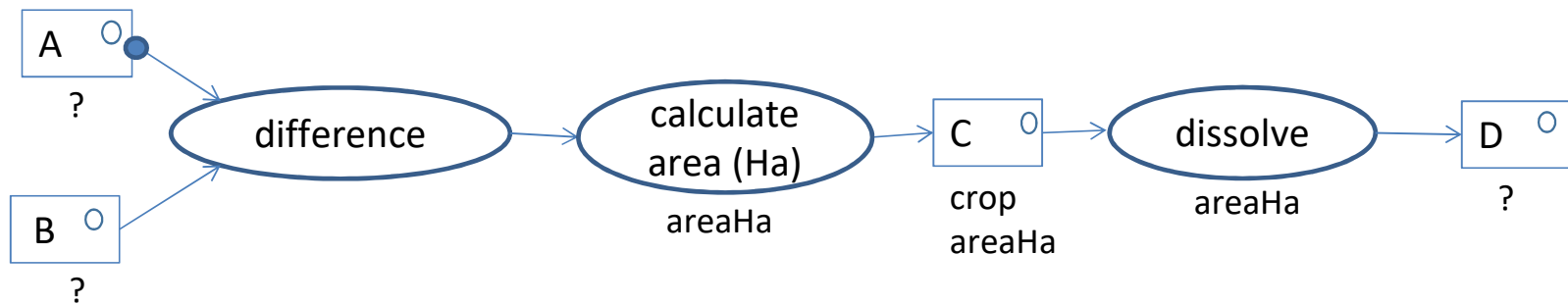
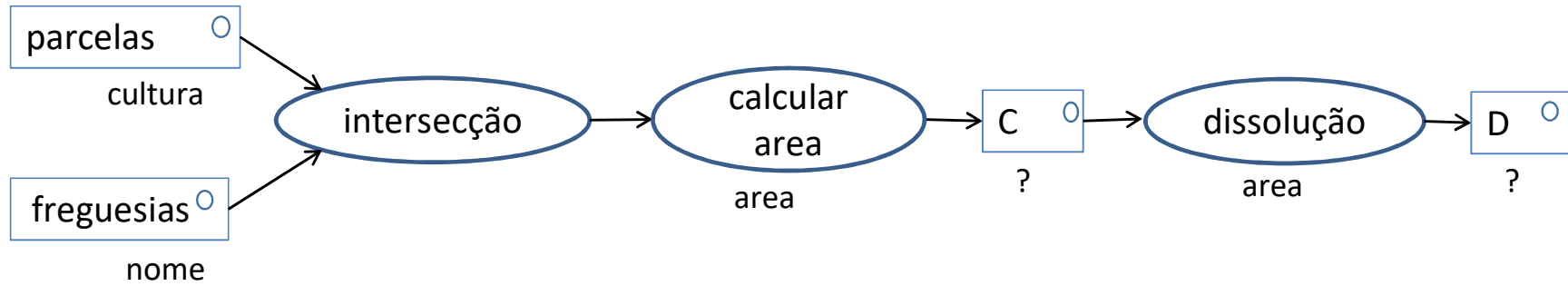
1	2
3	

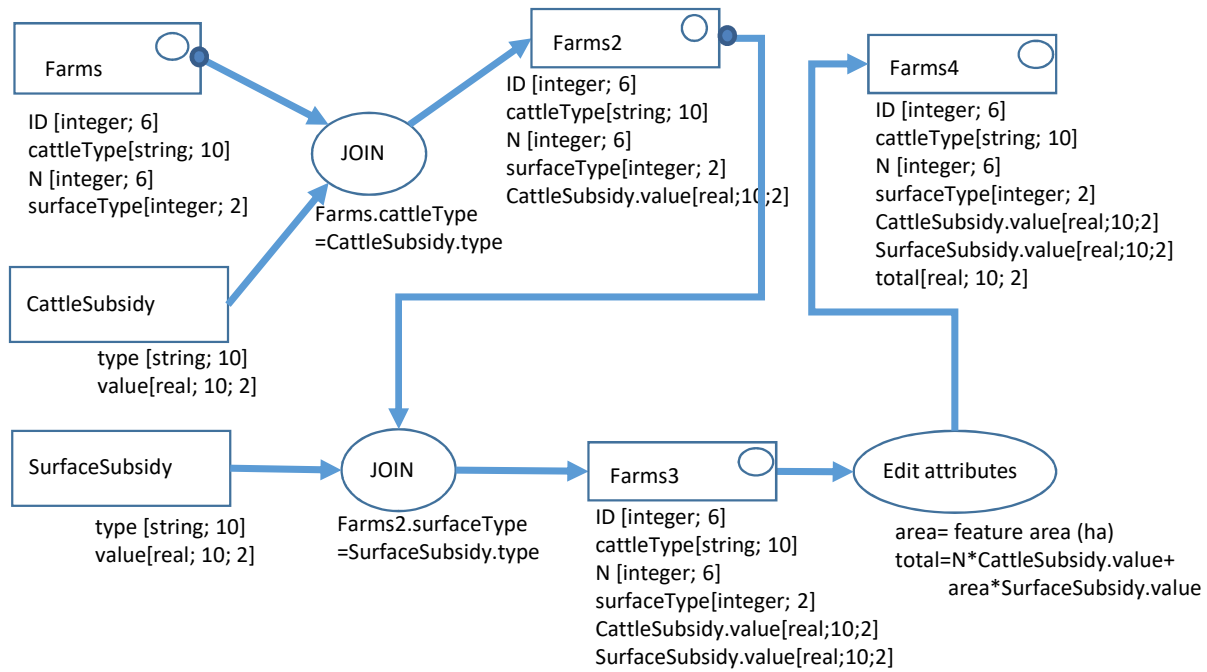
	atrib1
1	a
2	b
3	b

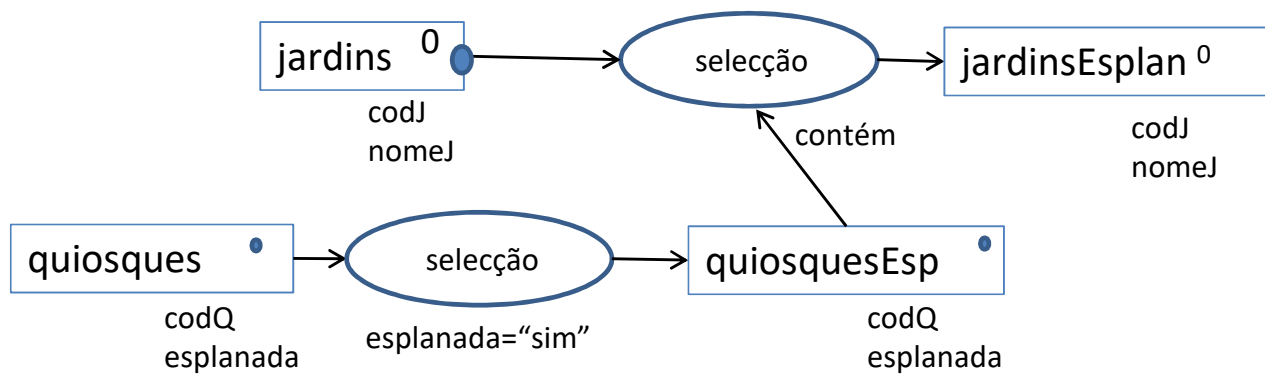
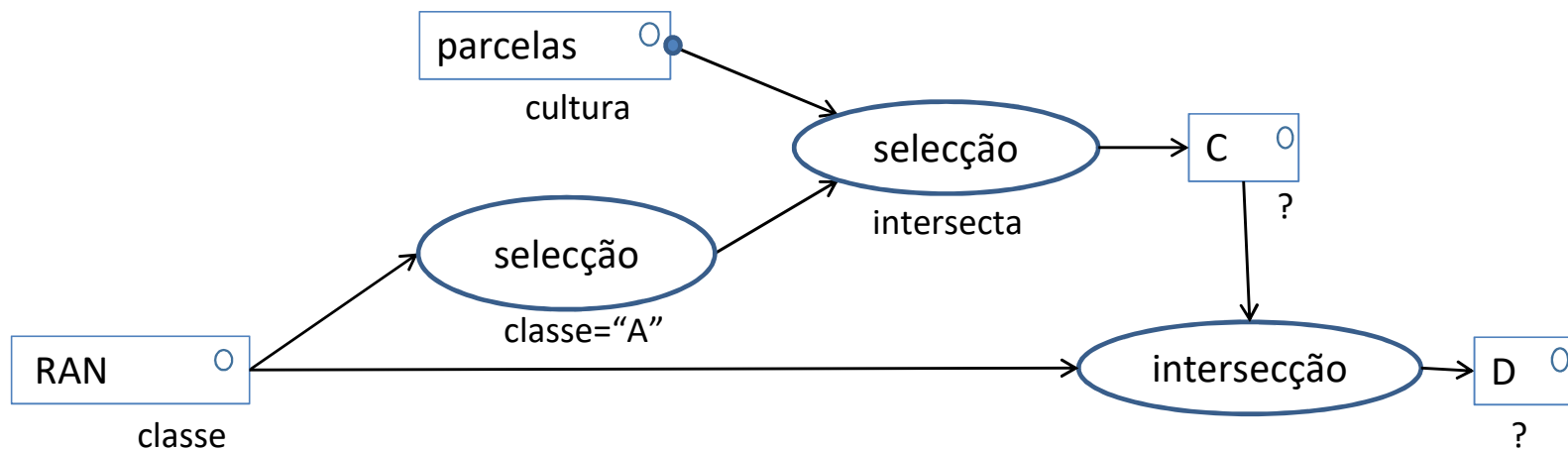
B

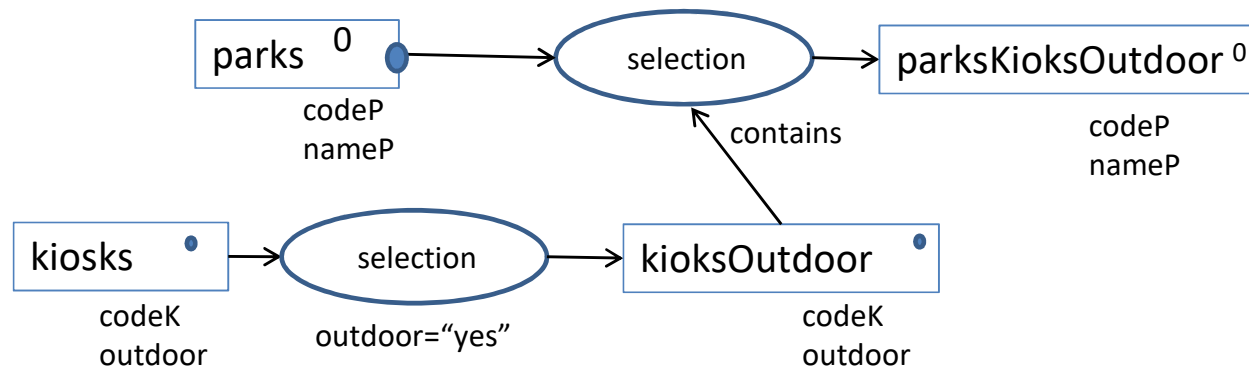
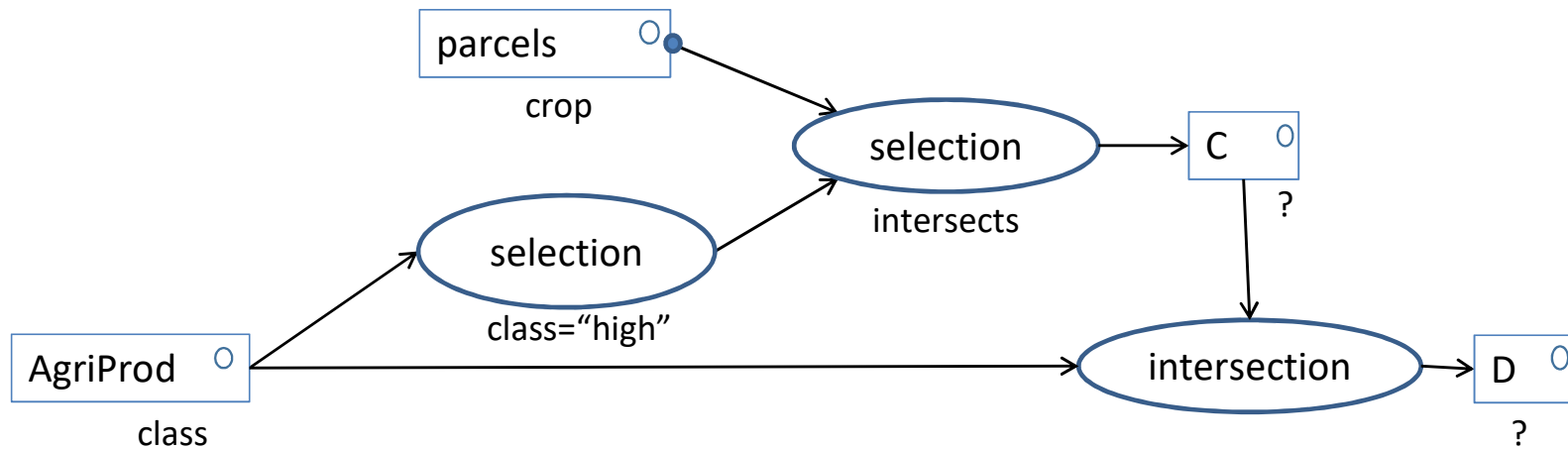
	atrib2
1	10
2	15
3	10

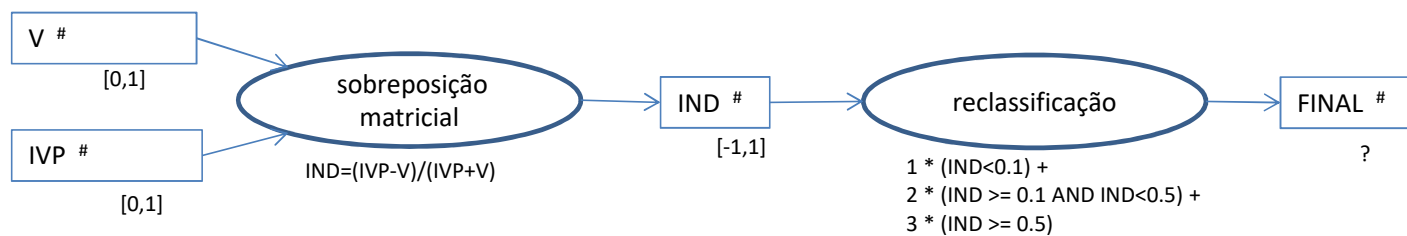
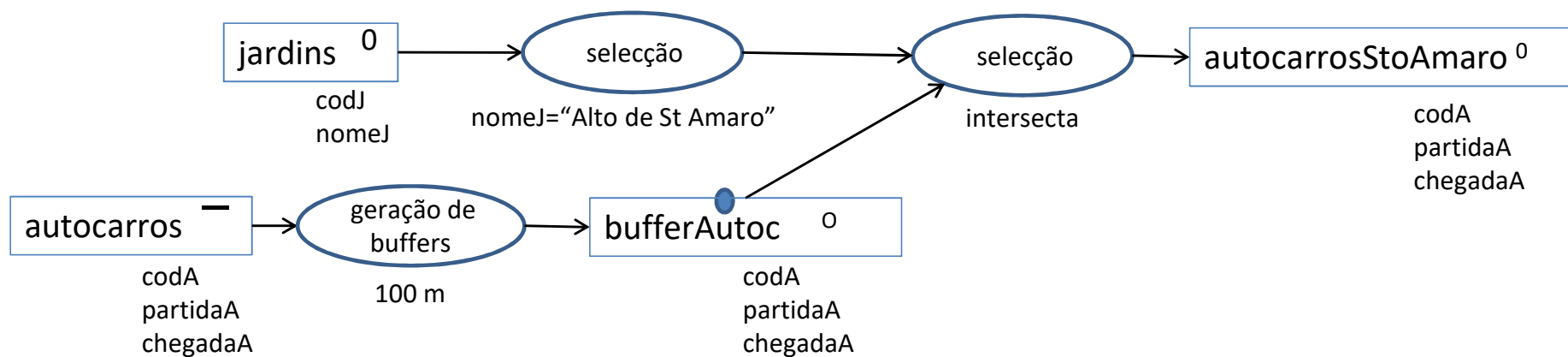
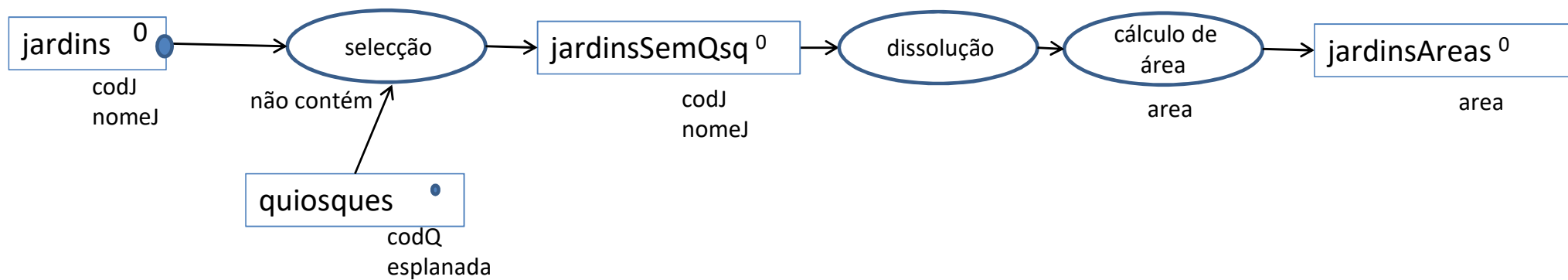


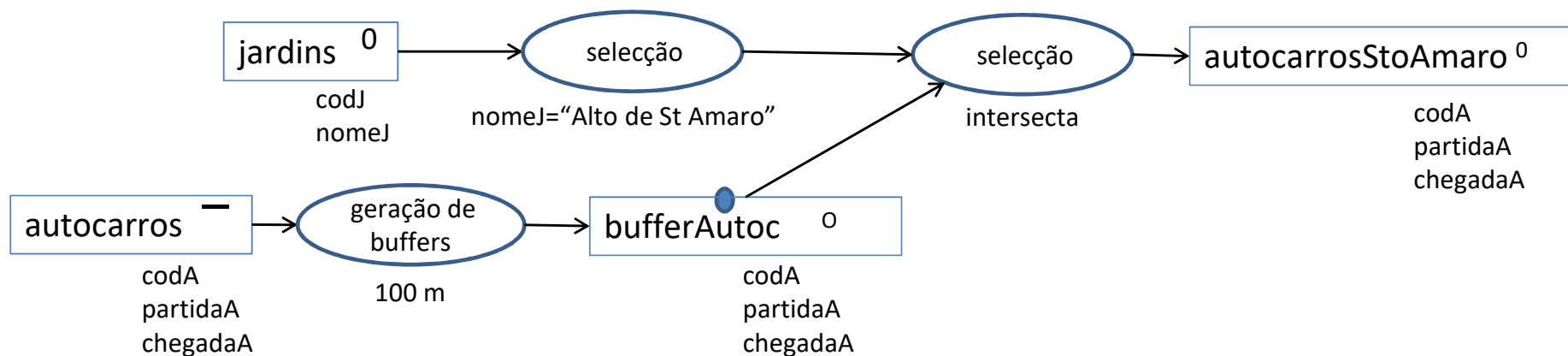
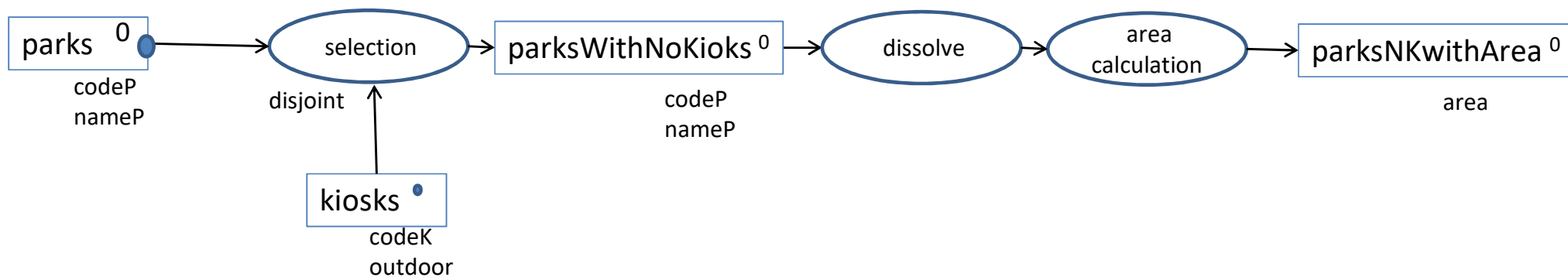


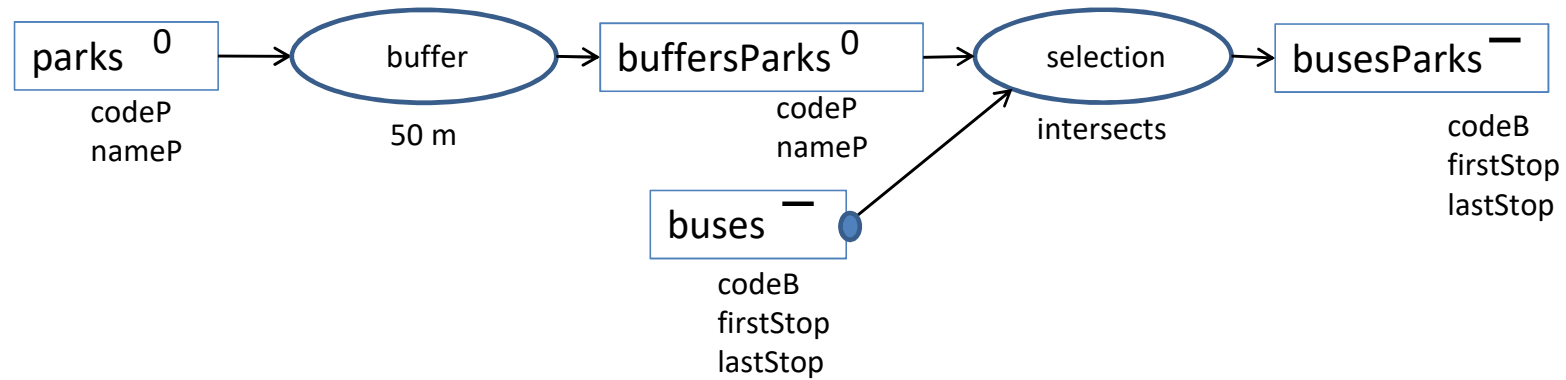
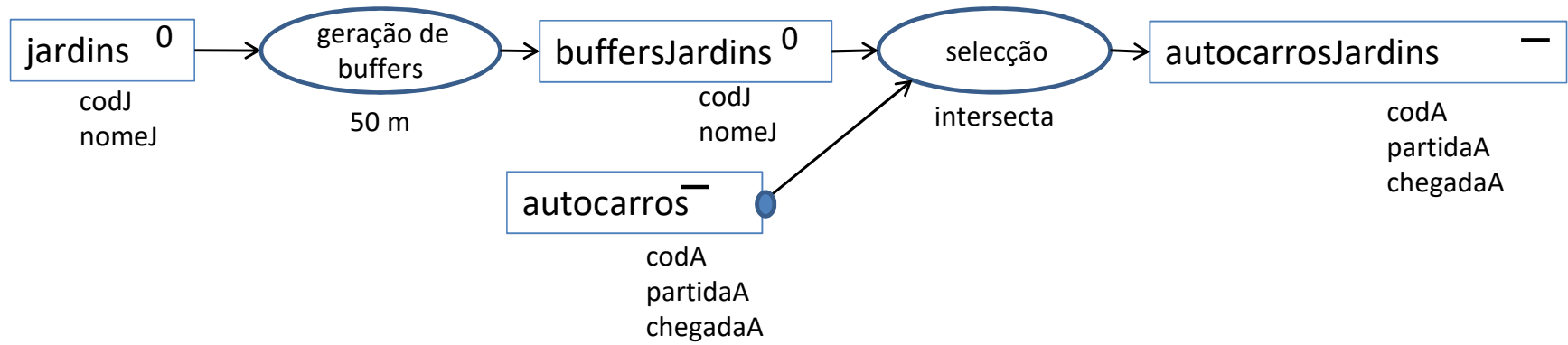


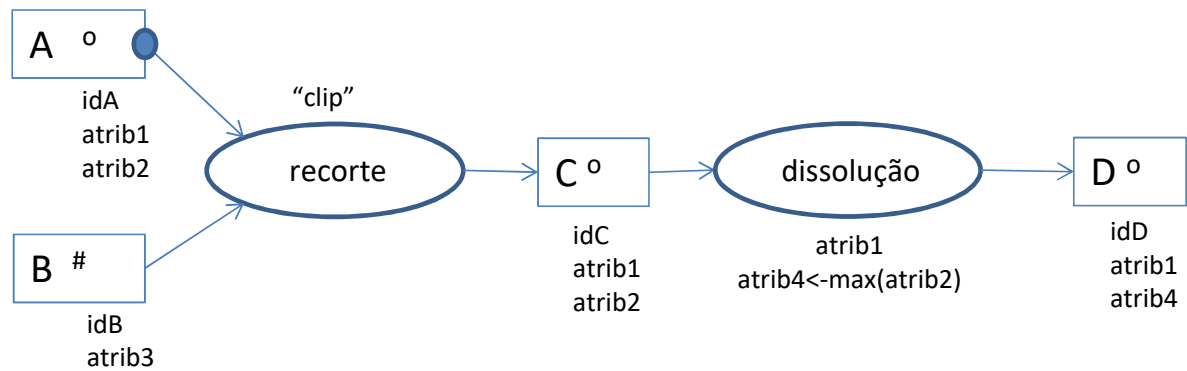




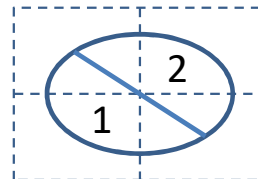






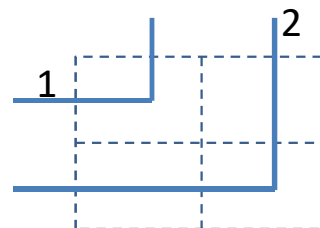
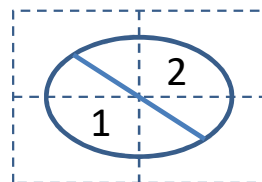
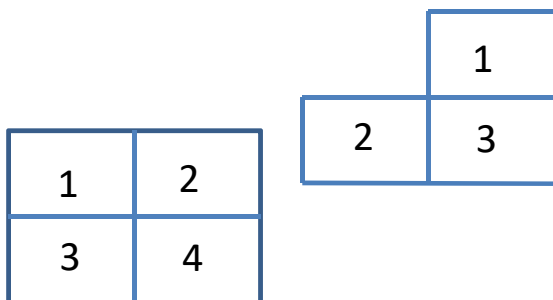
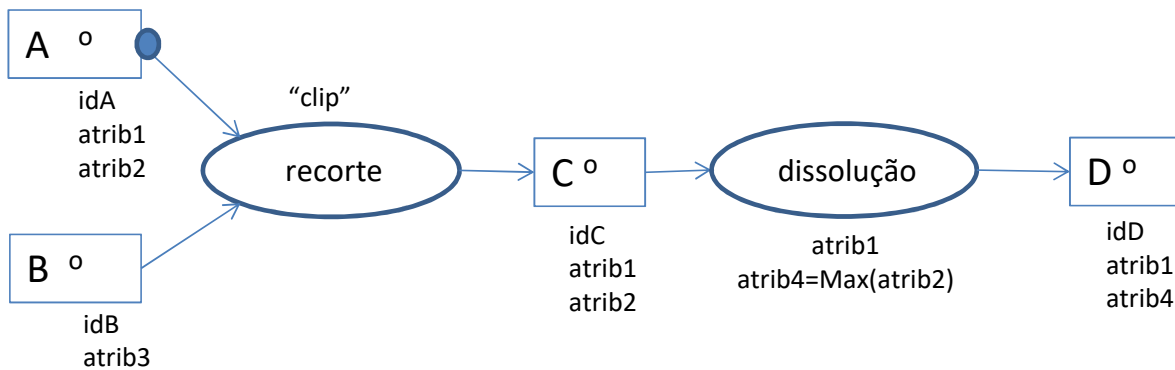


1	2
3	4



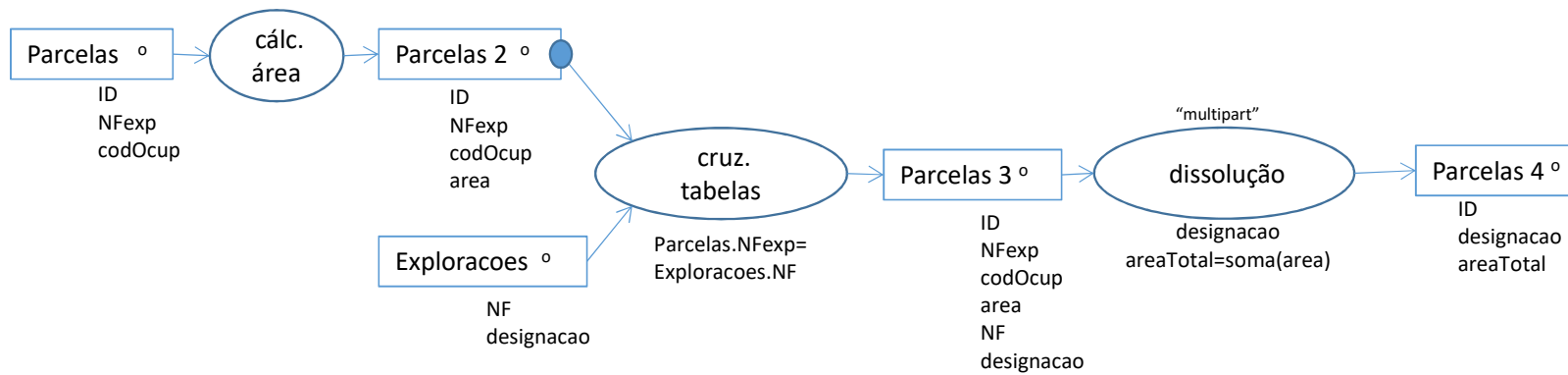
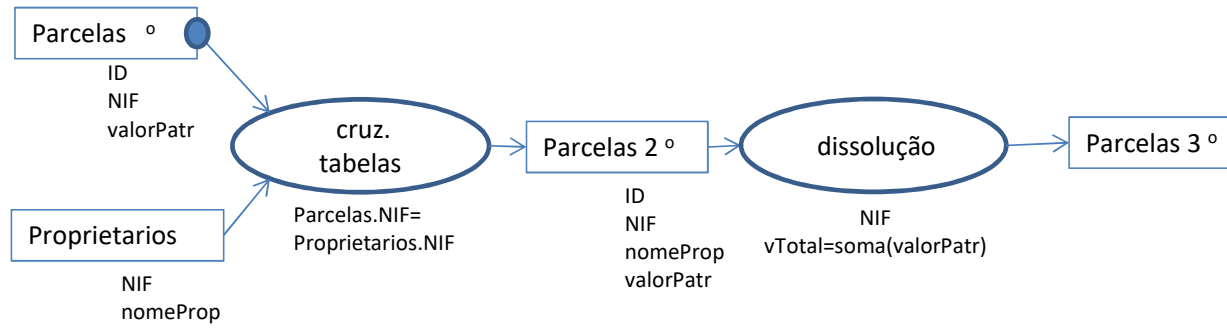
idA	atrib1	atrib2
1	X	4
2	X	3
3	X	6
4	Y	11

idB	atrib3
1	4
2	-2

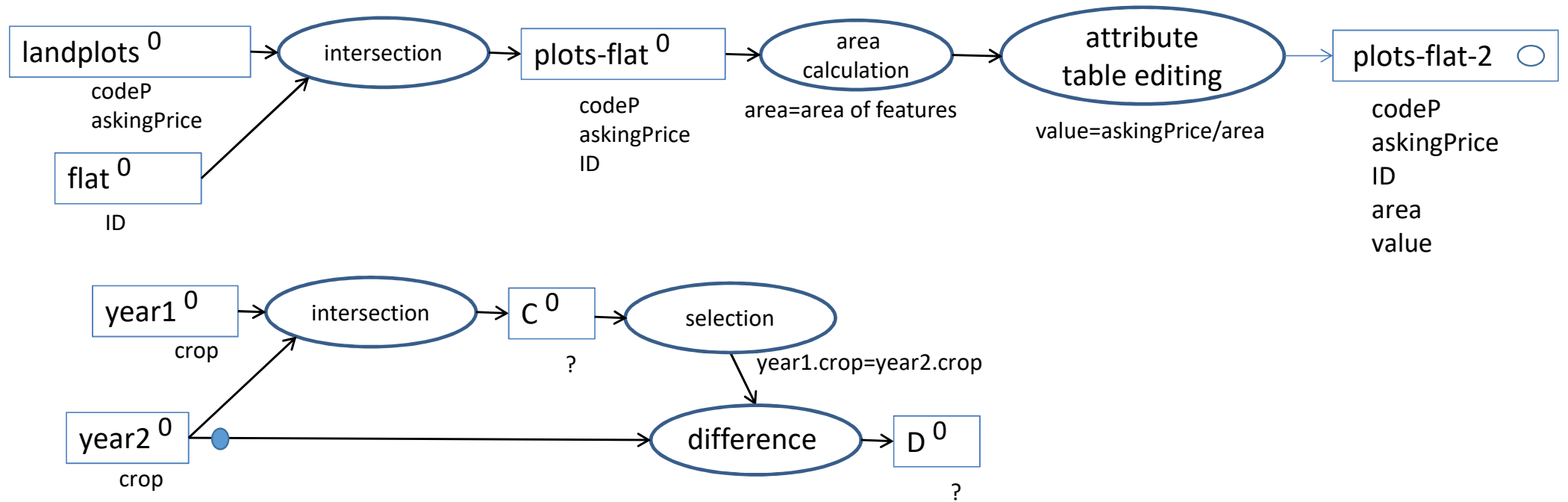


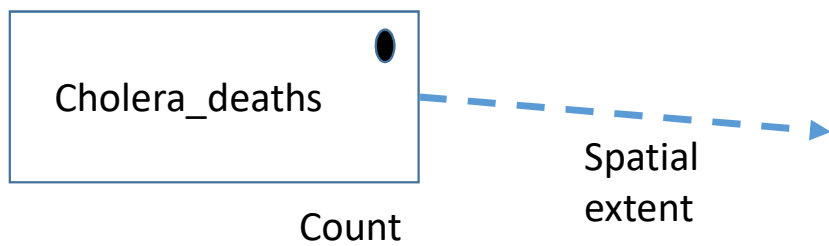
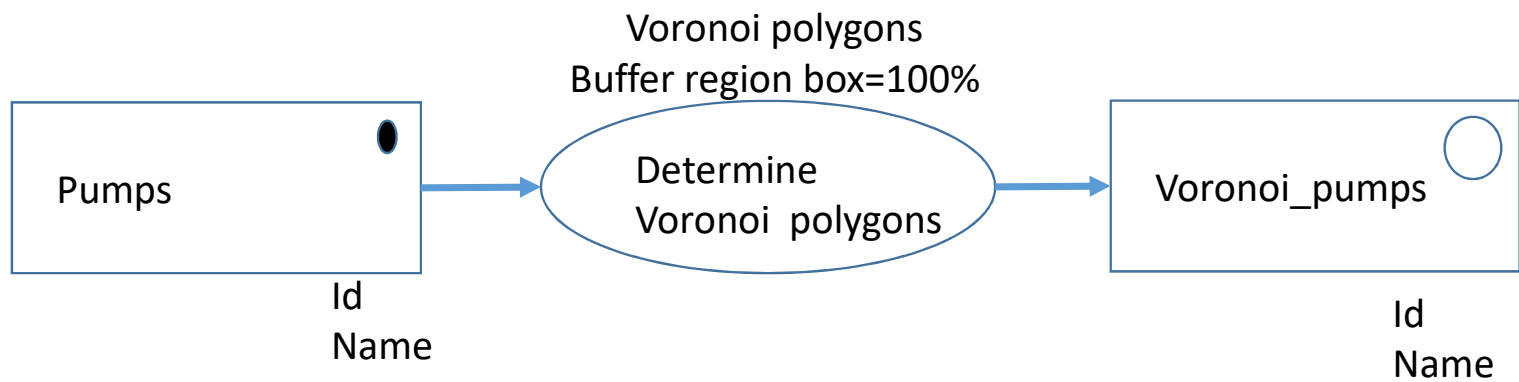
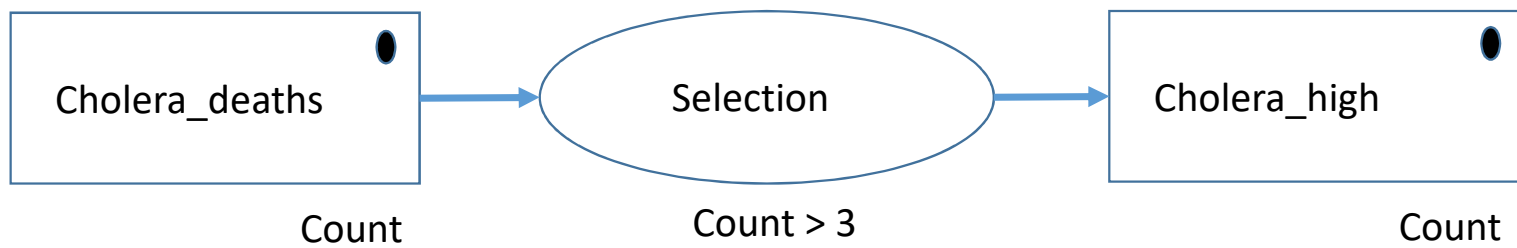
idA	atrib1	atrib2
1	X	4
2	X	3
3	X	6
4	Y	11

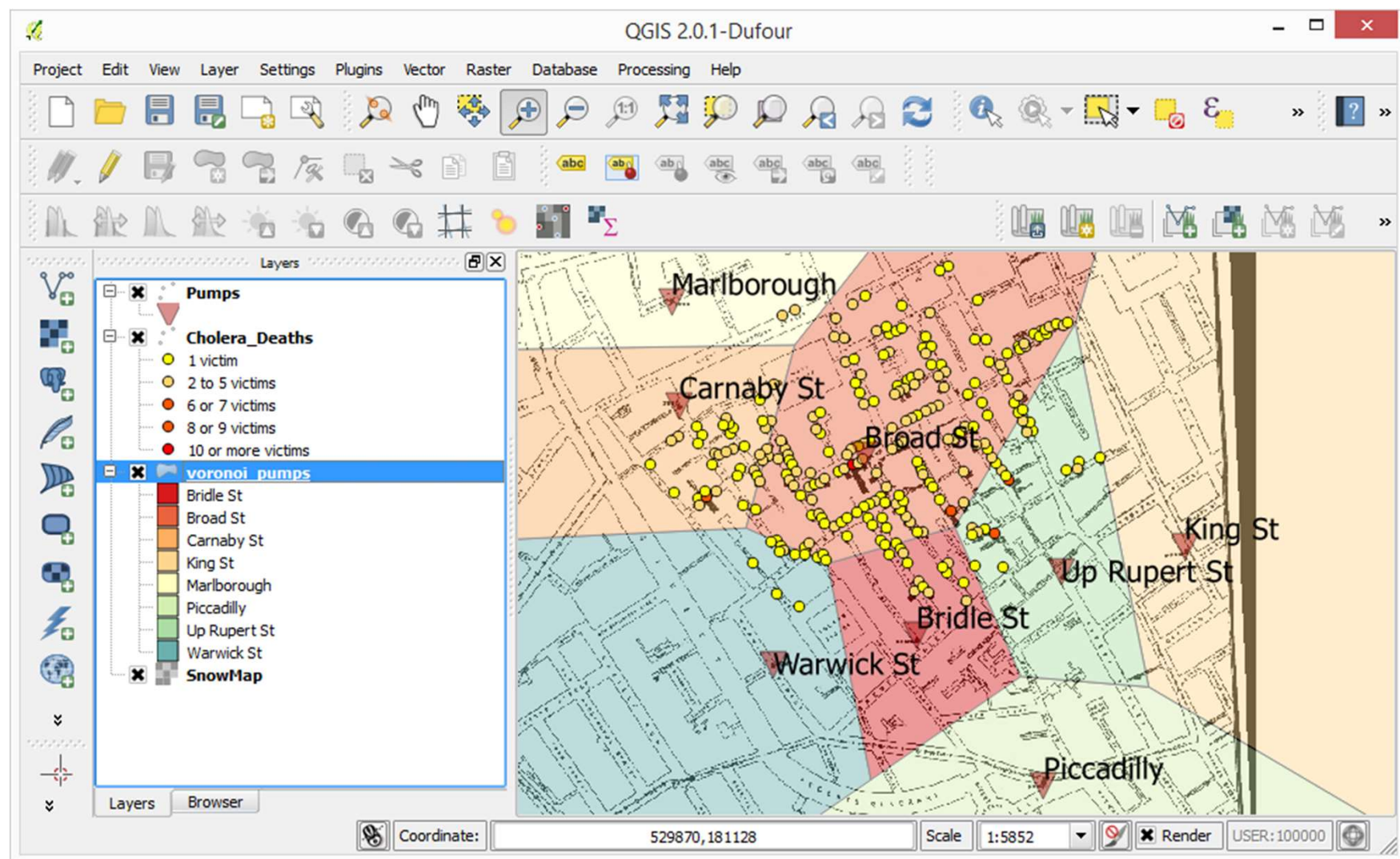
idB	atrib3
1	A1
2	N10



GIS 2016-2017





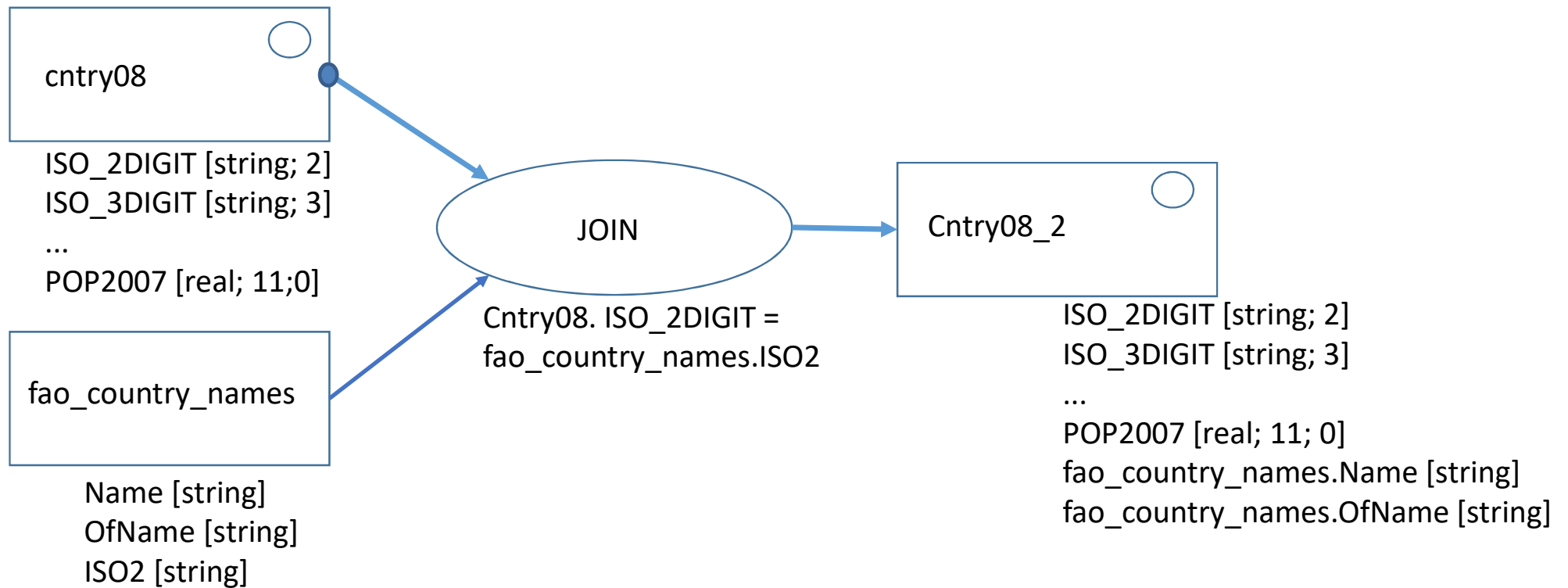











WGS84 Ellipsoid

Geodetic height=-20m



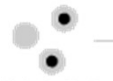






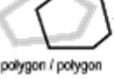


Mean sea level, approximated
by the Geoid



 point / point → nil	 point / point → multipoint	 point / multipoint → multipoint
 multipoint / multipoint → nil	 multipoint / multipoint → multipoint	 linestring / linestring → multilinestring
 linestring / linestring → nil	 polygon / polygon → nil	 polygon / polygon → polygon

Difference

 point / point → multipoint	 point / multipoint → multipoint
 multipoint / multipoint → multipoint	 point / linestring → multipoint
 multipoint / linestring → multipoint	 linestring / linestring → multilinestring
 point / polygon → multipoint	 multipoint / polygon → multipoint
 linestring / polygon → multilinestring	 polygon / polygon → multipolygon

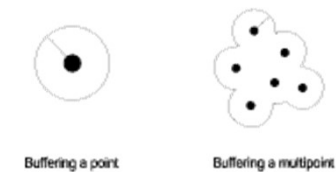
Intersection

From

<http://publib.boulder.ibm.com/infocenter/db2luw/v8/in>



Convex hull



Buffering a point

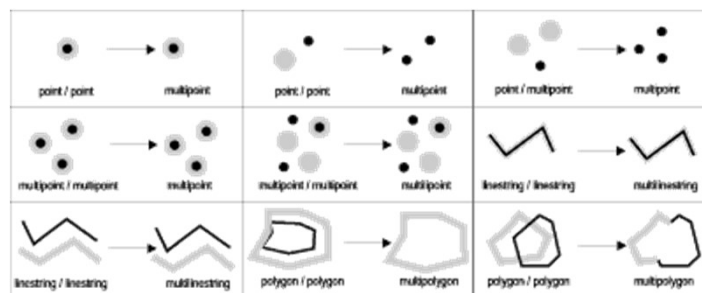
Buffering a multipoint



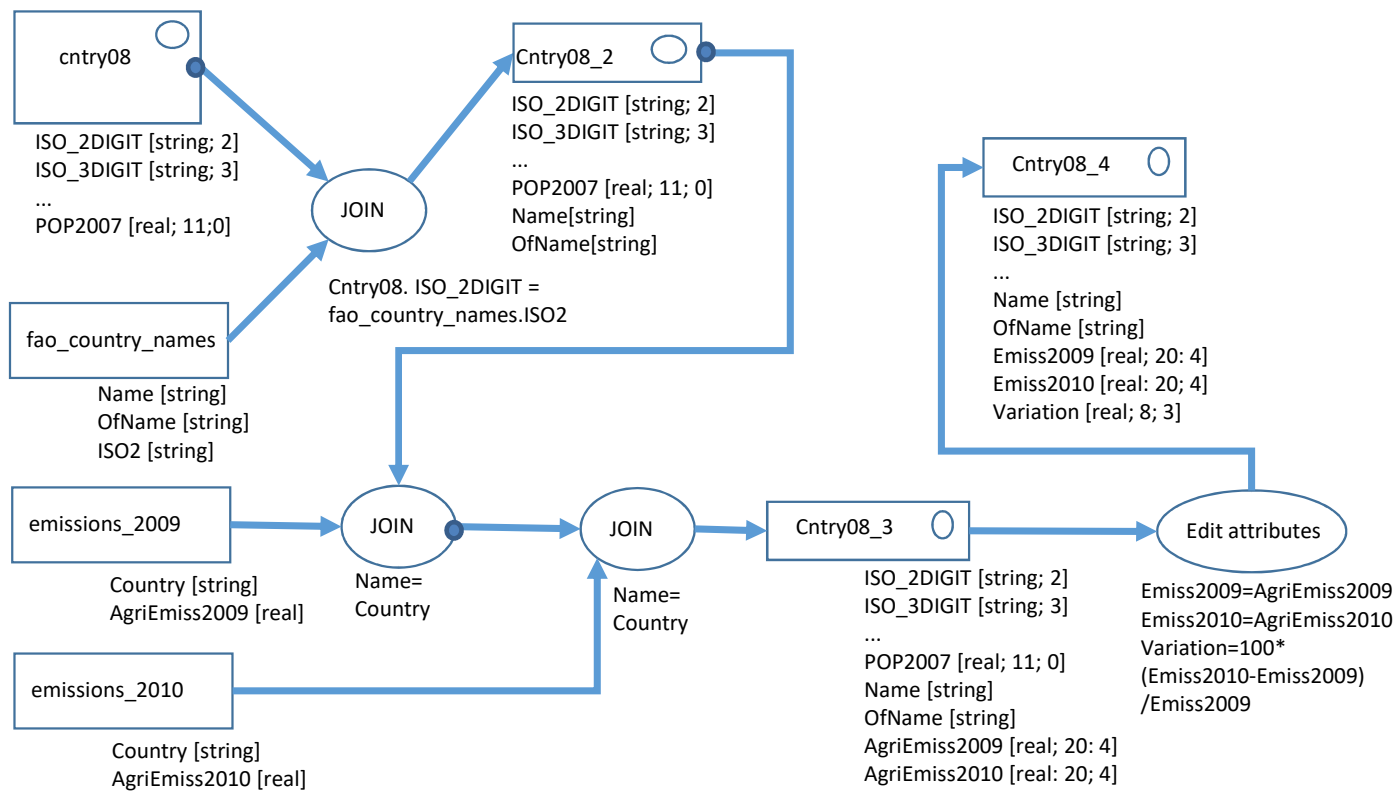
Buffering a linestring

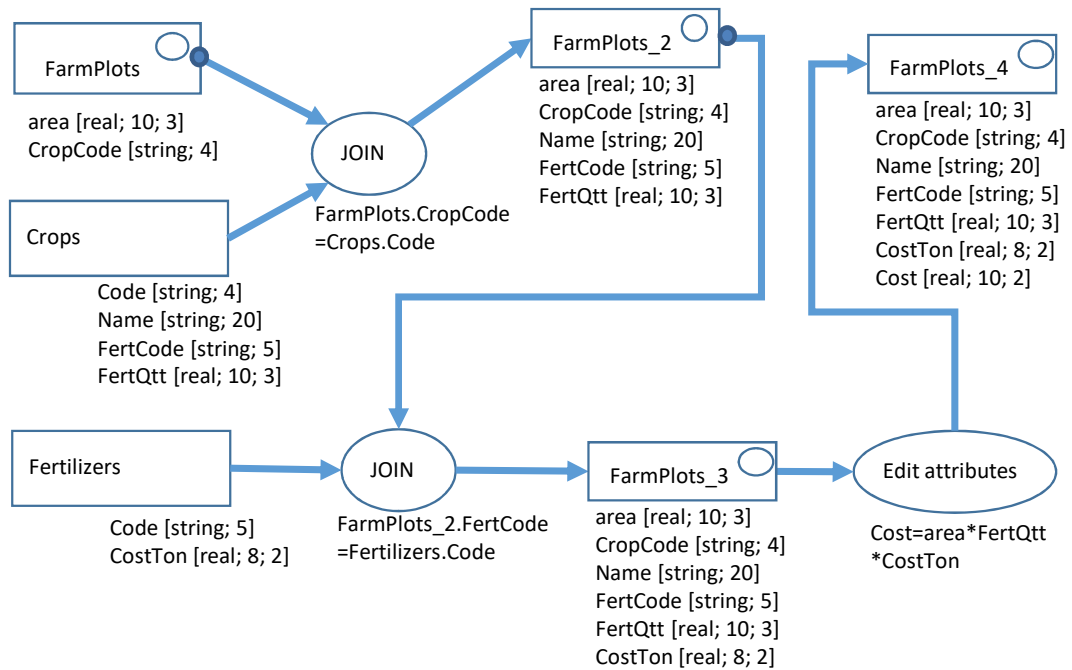
Buffering a polygon with one interior ring

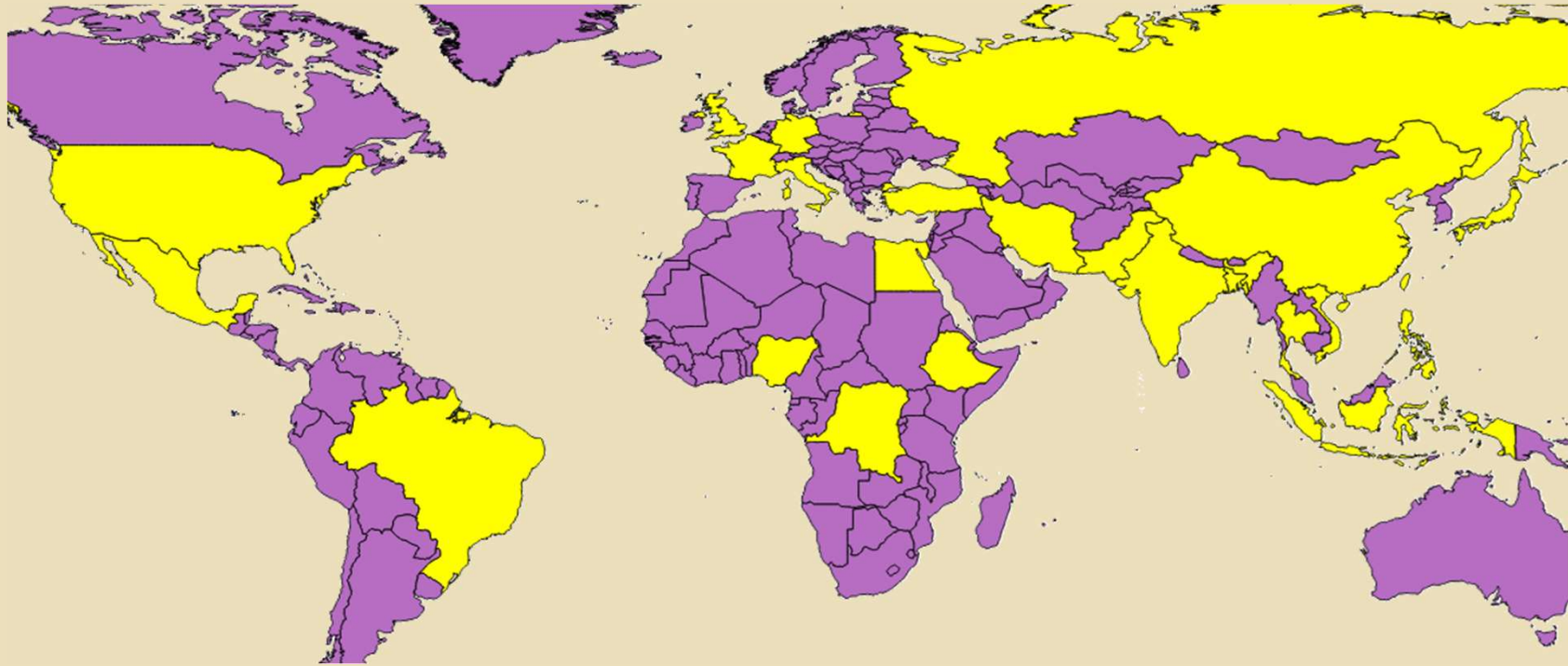
buffer



union

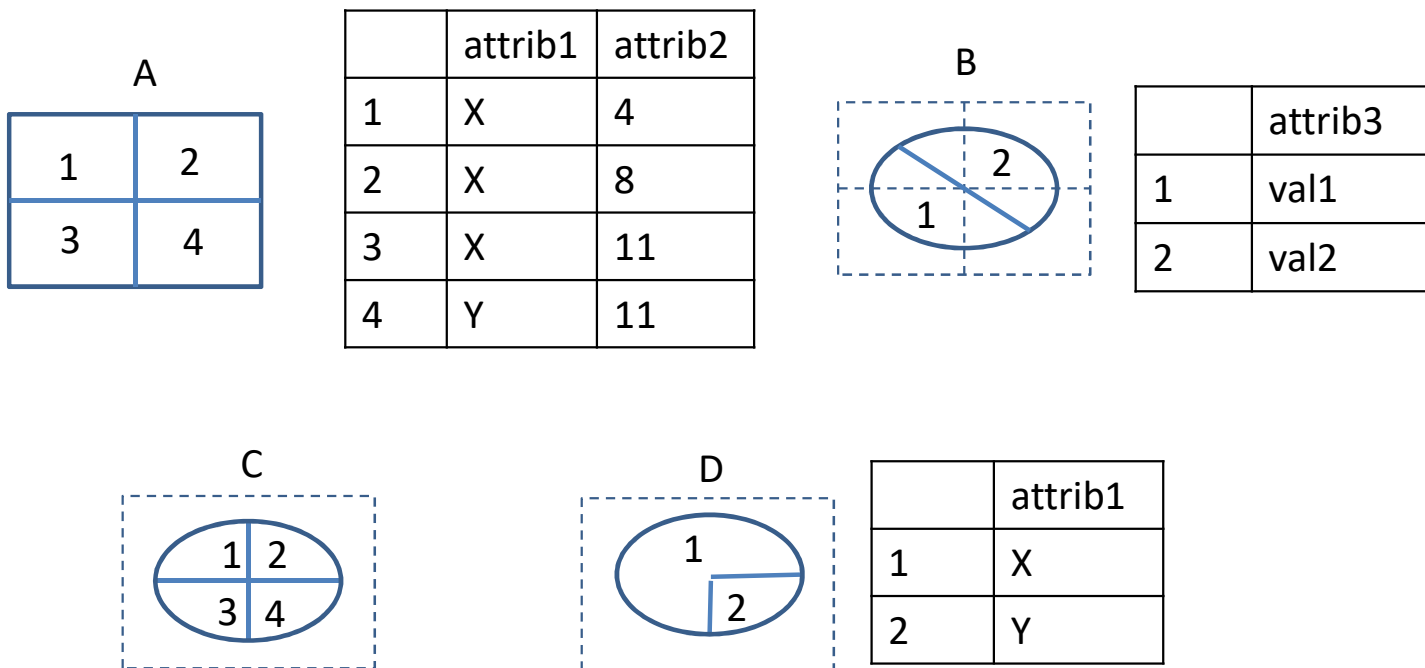
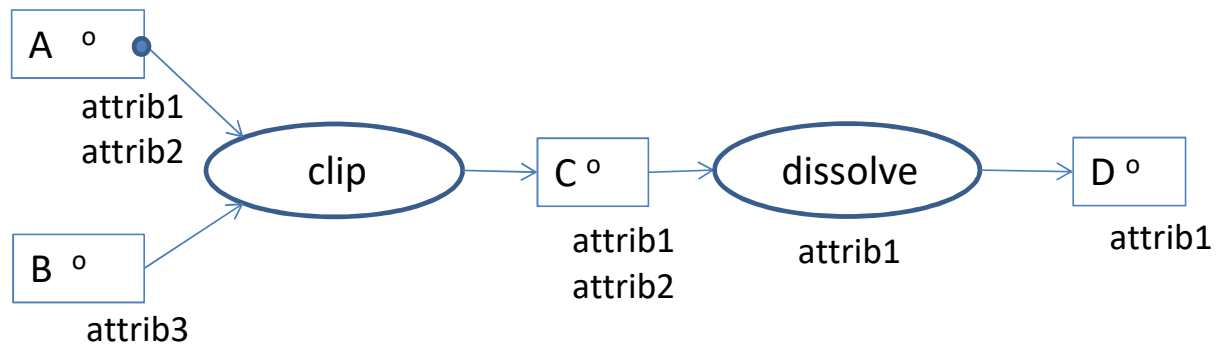


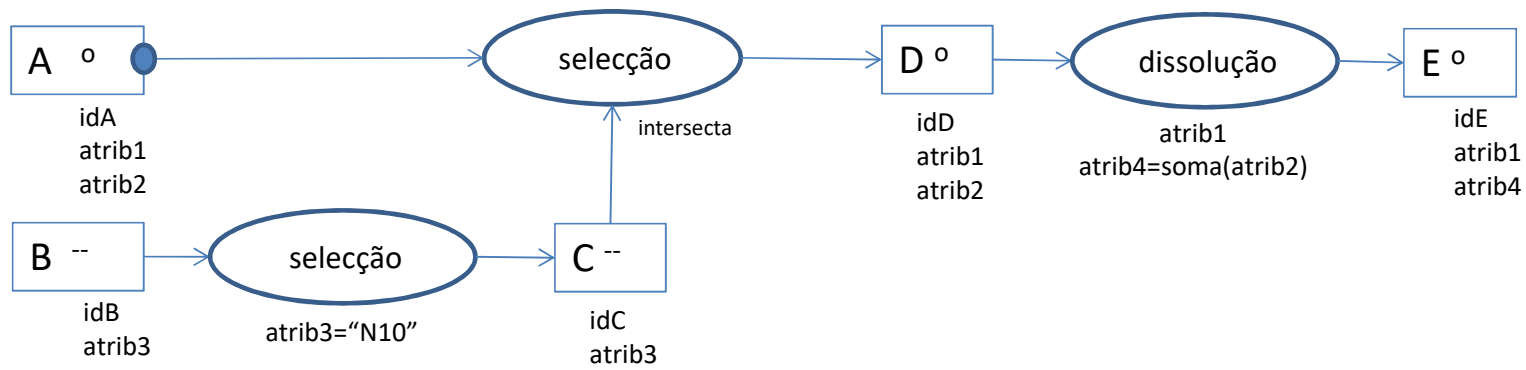




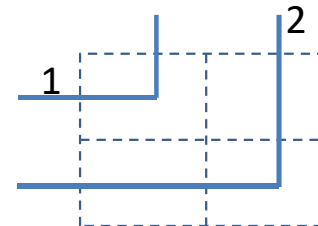
"POP2007" > 50000000

This is not spatial analysis.

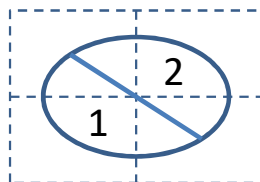




1	2
3	4

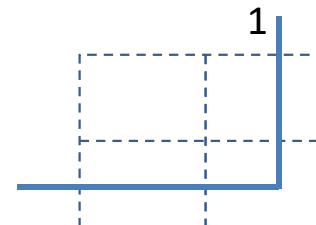


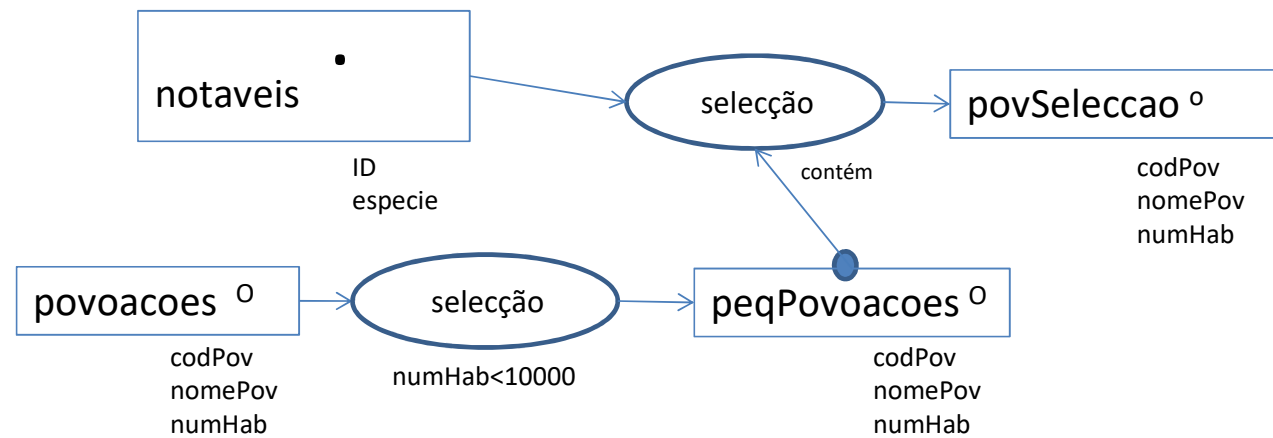
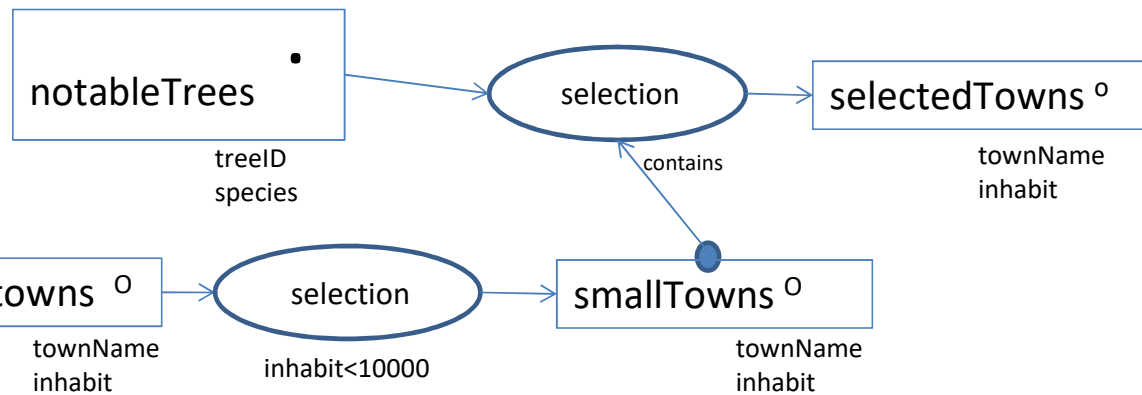
idA	atrib1	atrib2
1	X	4
2	X	3
3	Y	6
4	Y	11

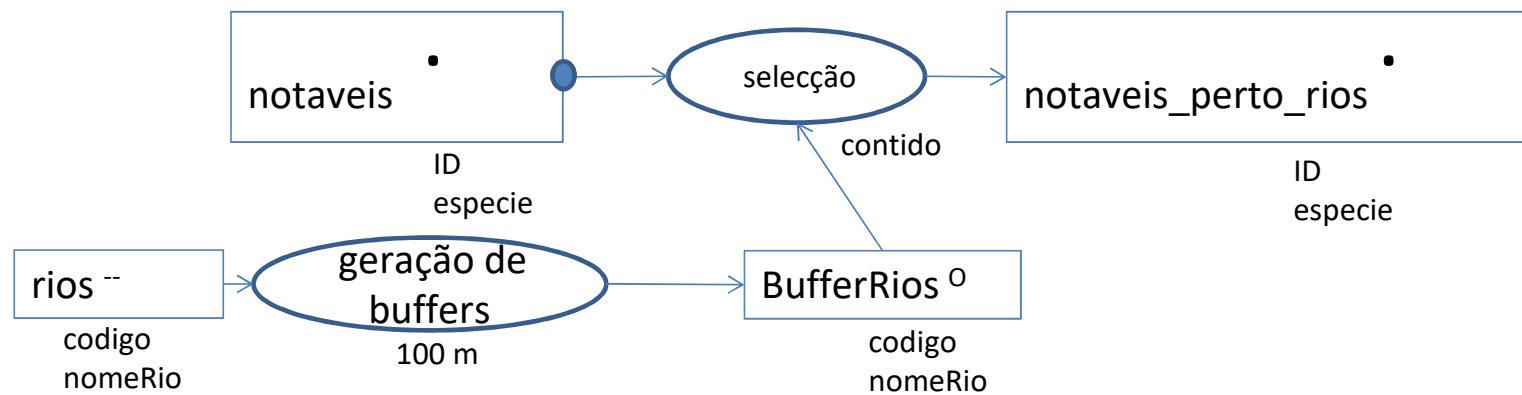
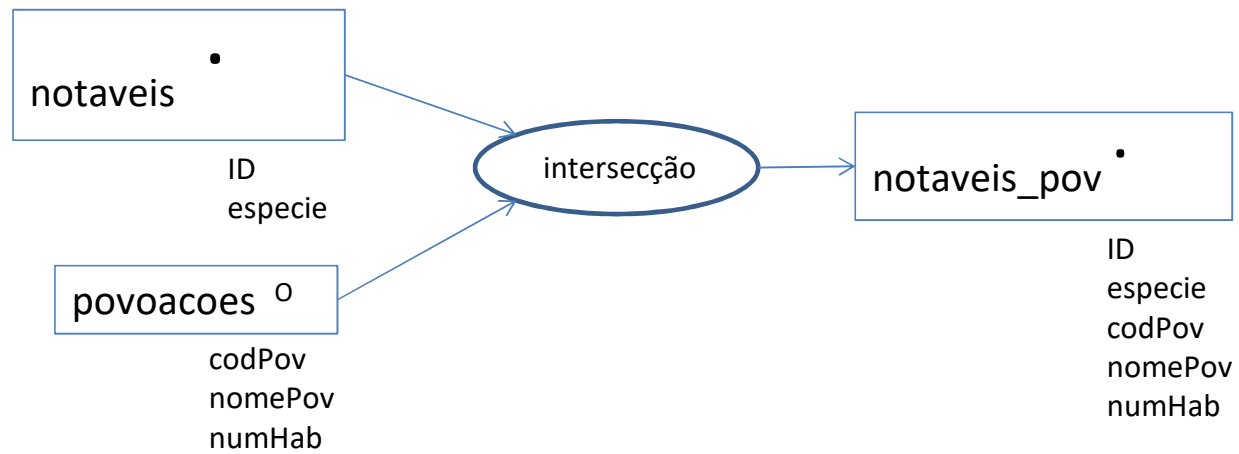


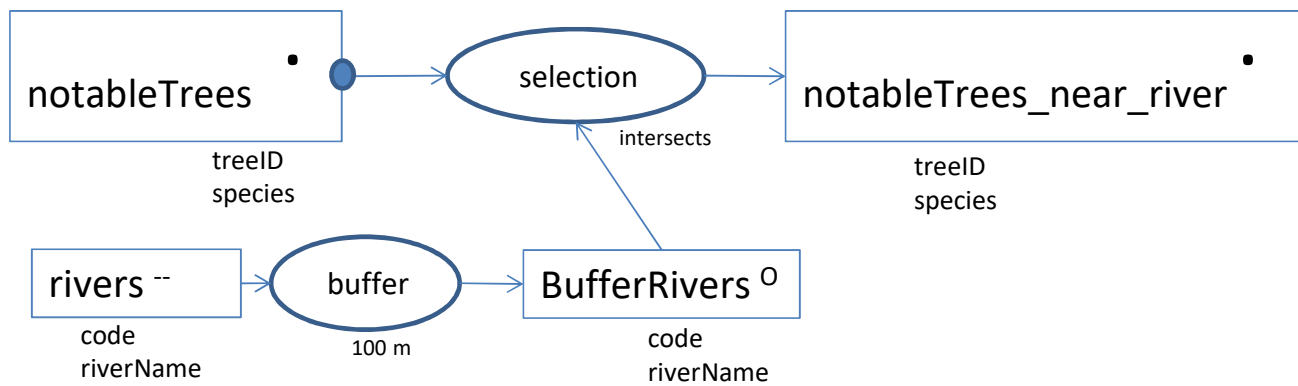
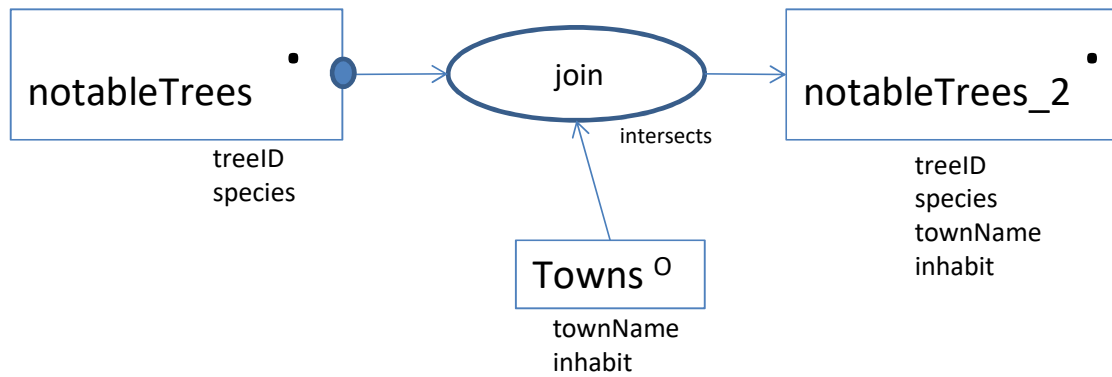
idB	atrib3
1	A1
2	N10

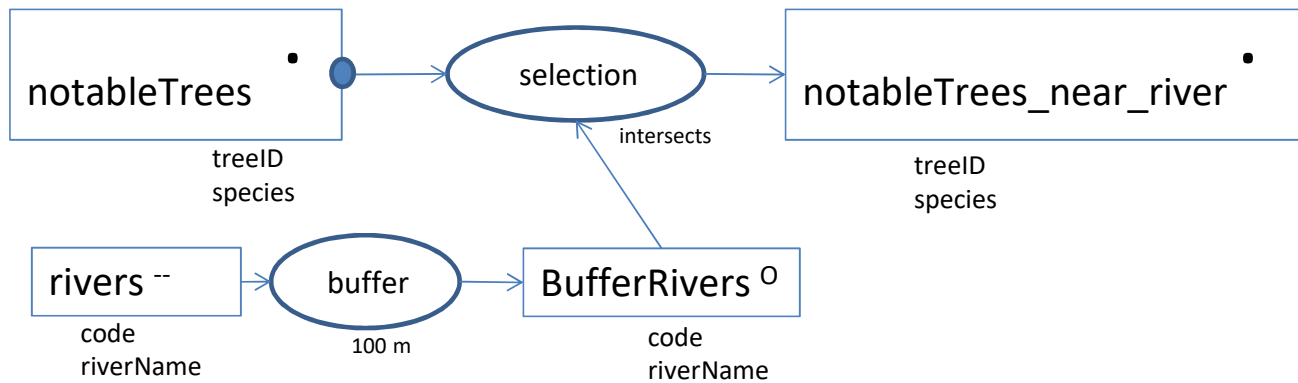
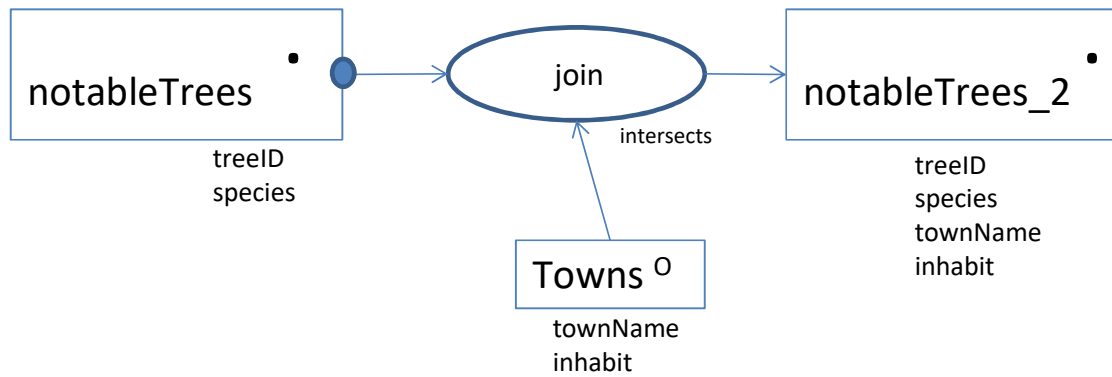
idC	atrib3
1	N10

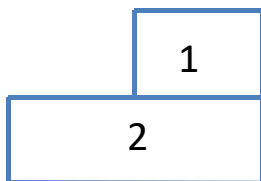




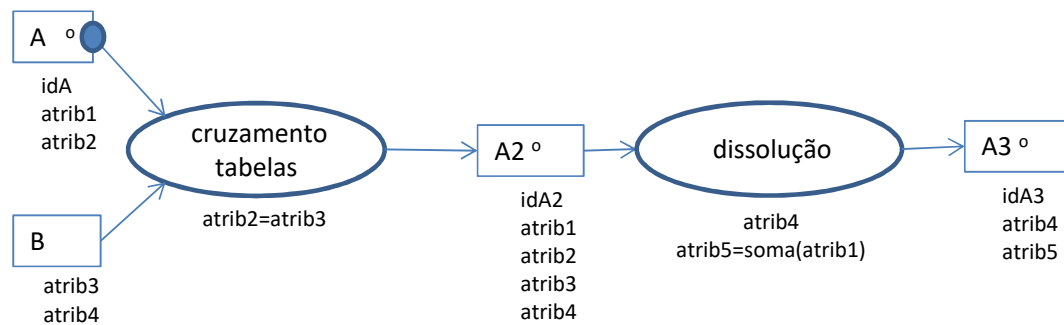
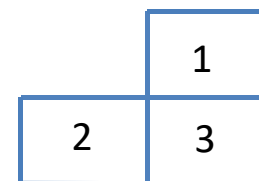


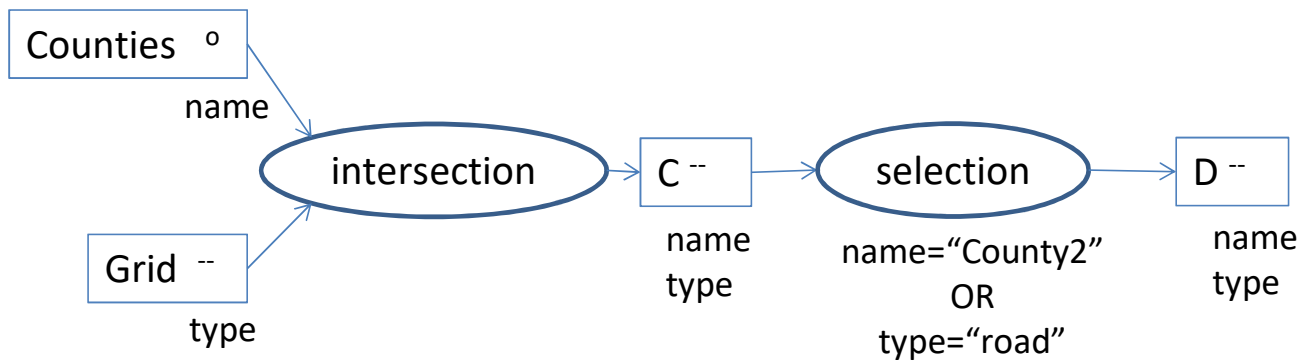






idE	atrib1	atrib4
1	X	3
2	Y	17



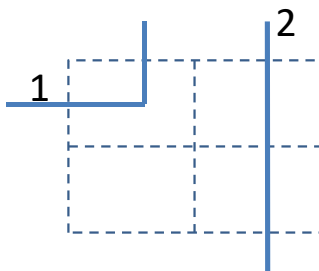


Counties

1	2
3	4

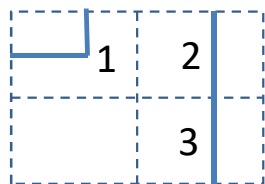
	name
1	County1
2	County1
3	County1
4	County2

Grid



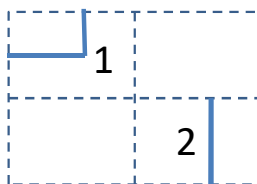
	type
1	road
2	highway

C

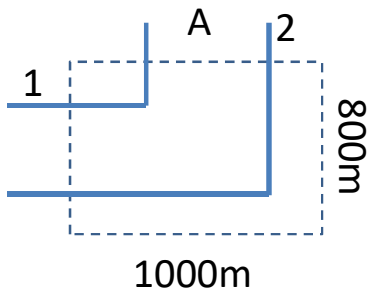
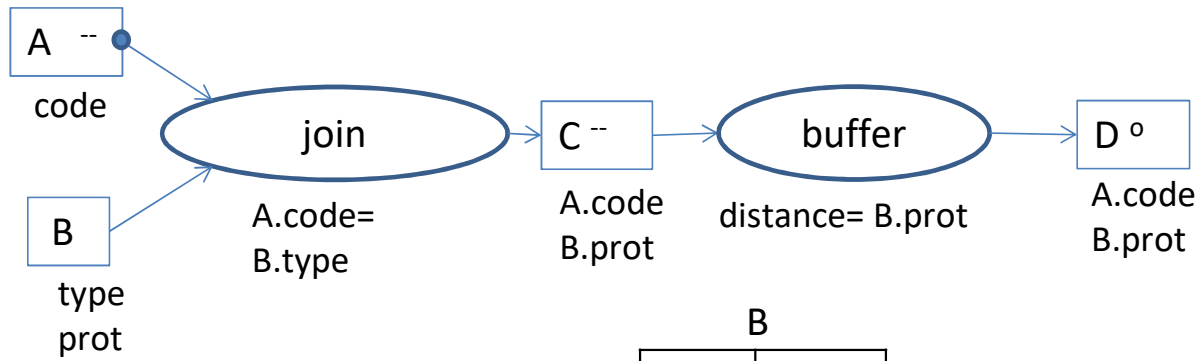


	name	type
1	County1	road
2	County1	highway
3	County2	highway

D

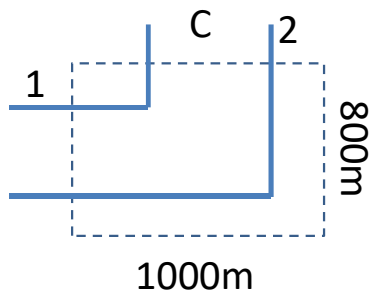


	name	type
1	County1	road
2	County2	highway

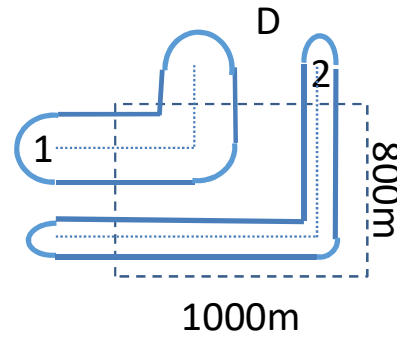


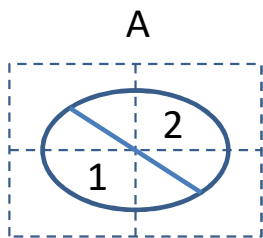
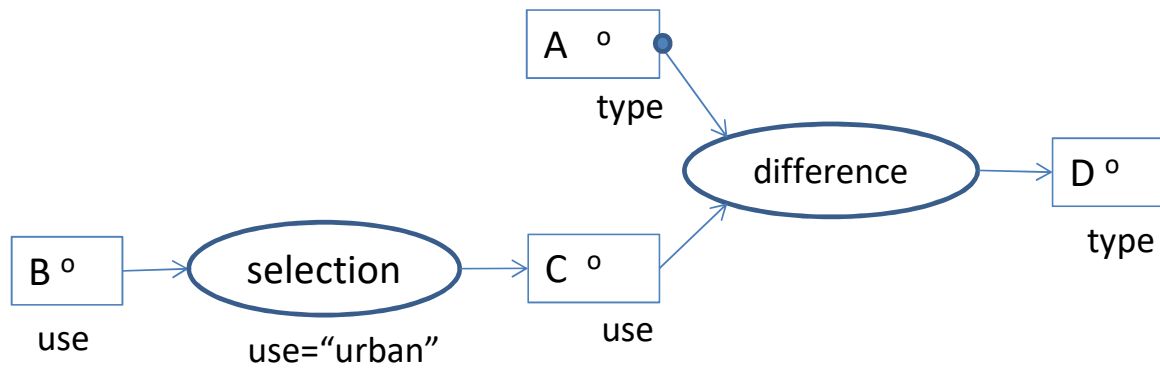
	code
1	M
2	S

B	
type	prot
T	50
M	200
Q	25
S	100

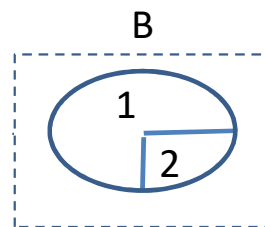


	A.code	B.prot
1	M	200
2	S	100

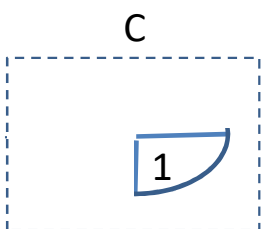




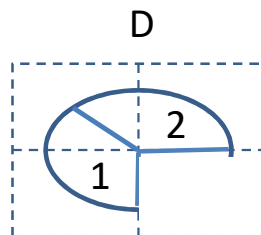
	type
1	sandy
2	clay



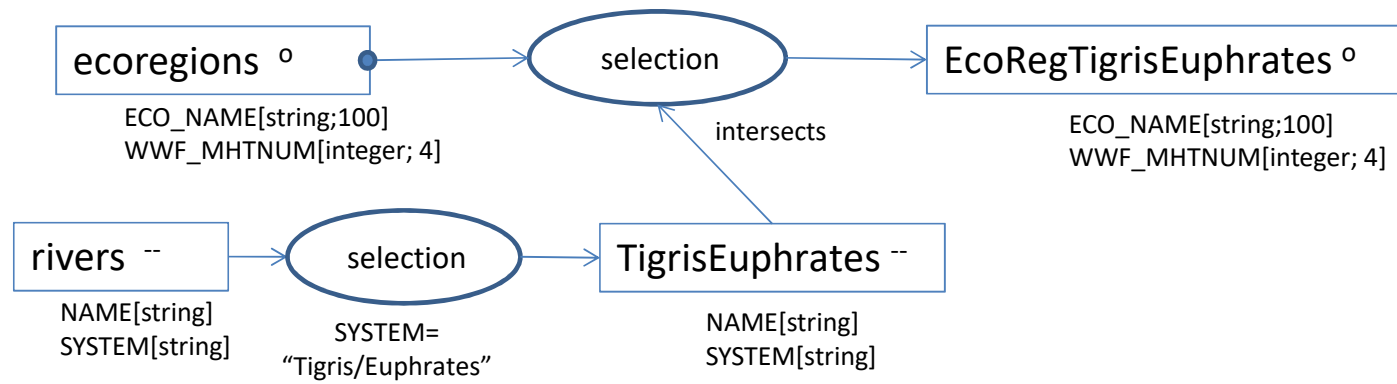
	use
1	farmland
2	urban



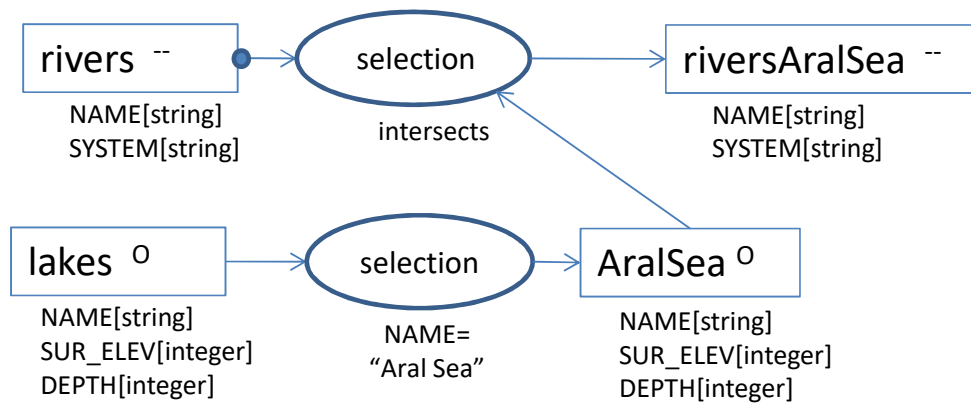
	use
1	urban



	type
1	sandy
2	clay

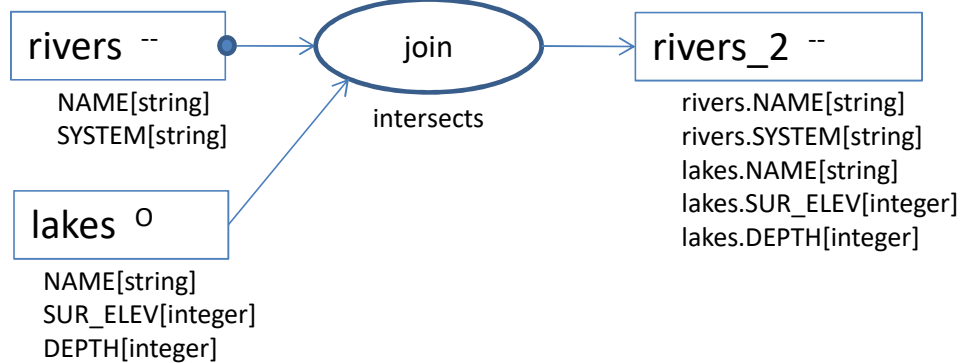
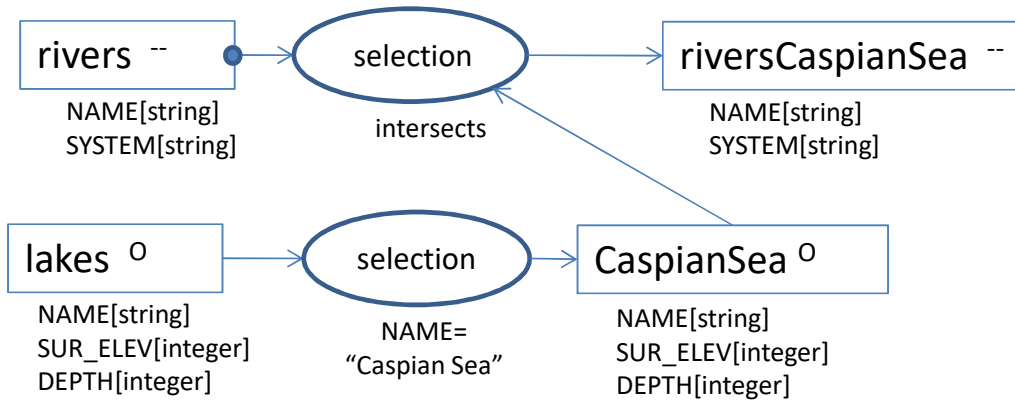


diagram_tigris_euphrates.JPG

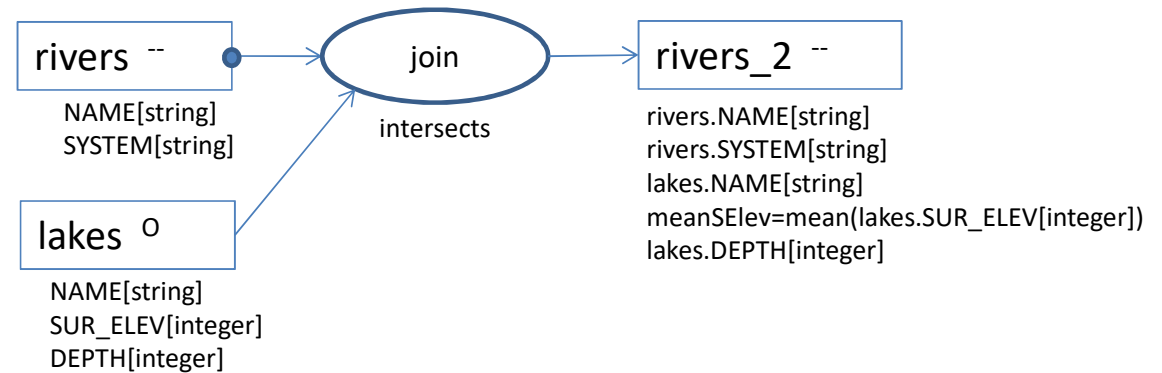


diagram_aral_sea.JPG

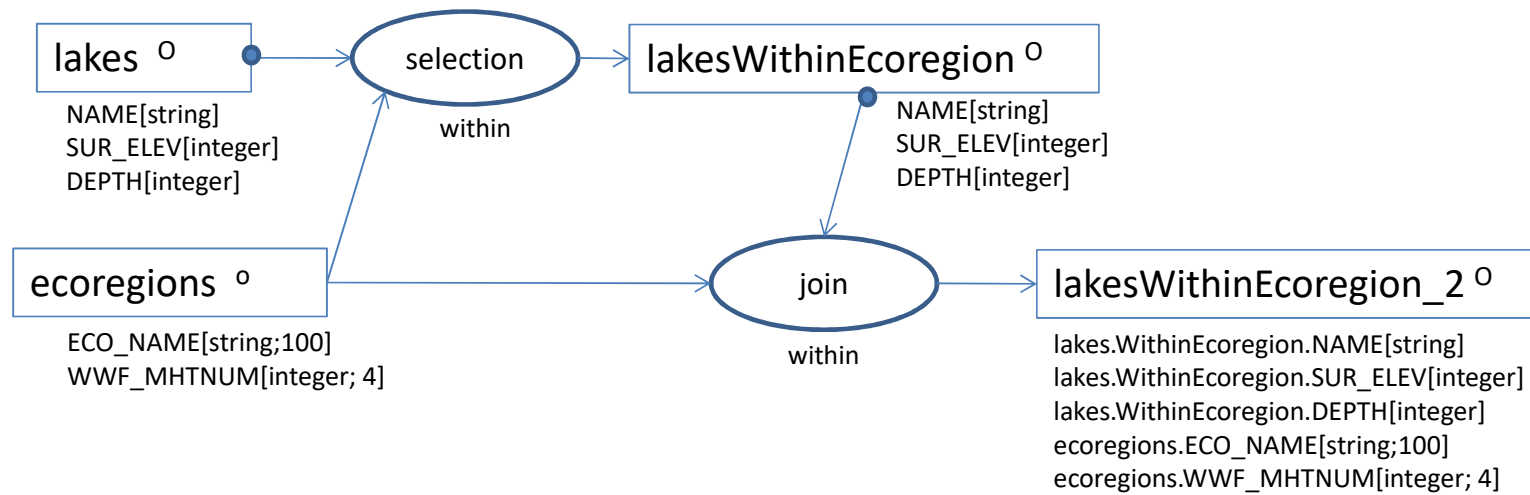
diagram_caspian_sea.JPG



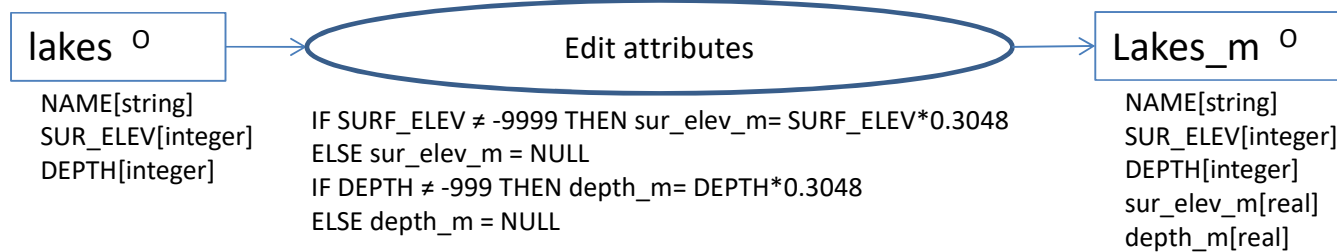
diagram_rivers_spatial_join_lakes.JPG



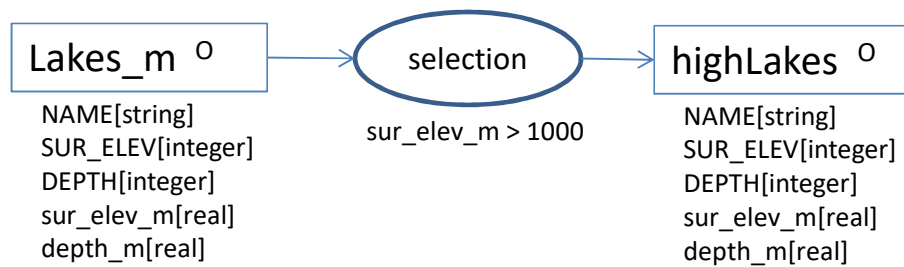
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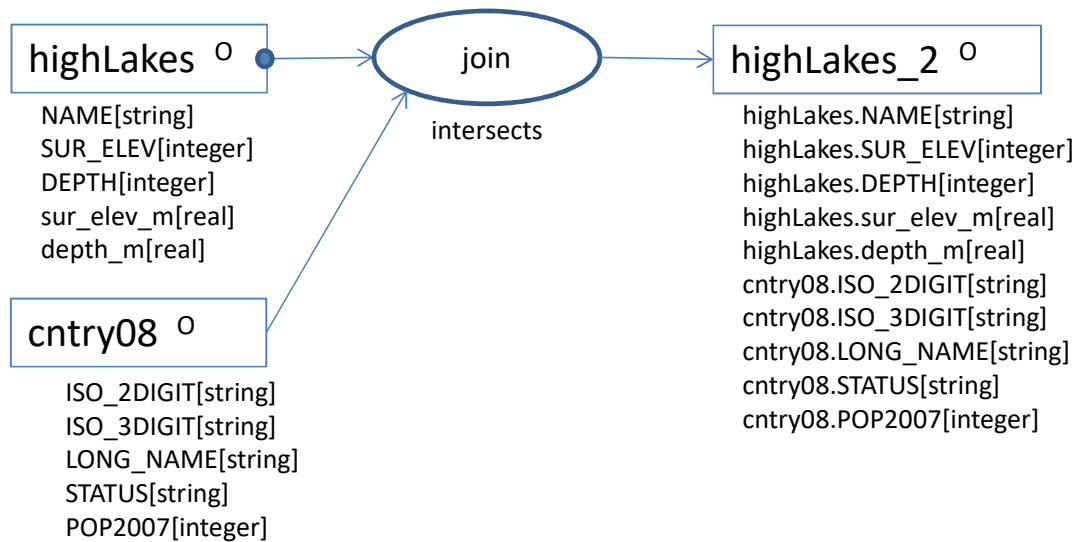
diagram_lakes_within_biome.JPG



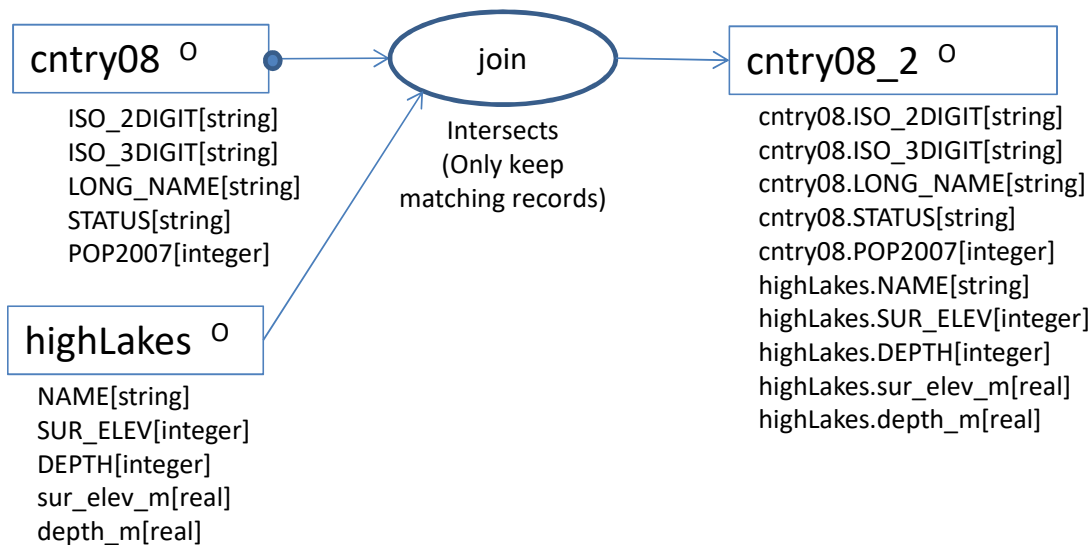
diagram_lakes_feet_to_meters.JPG



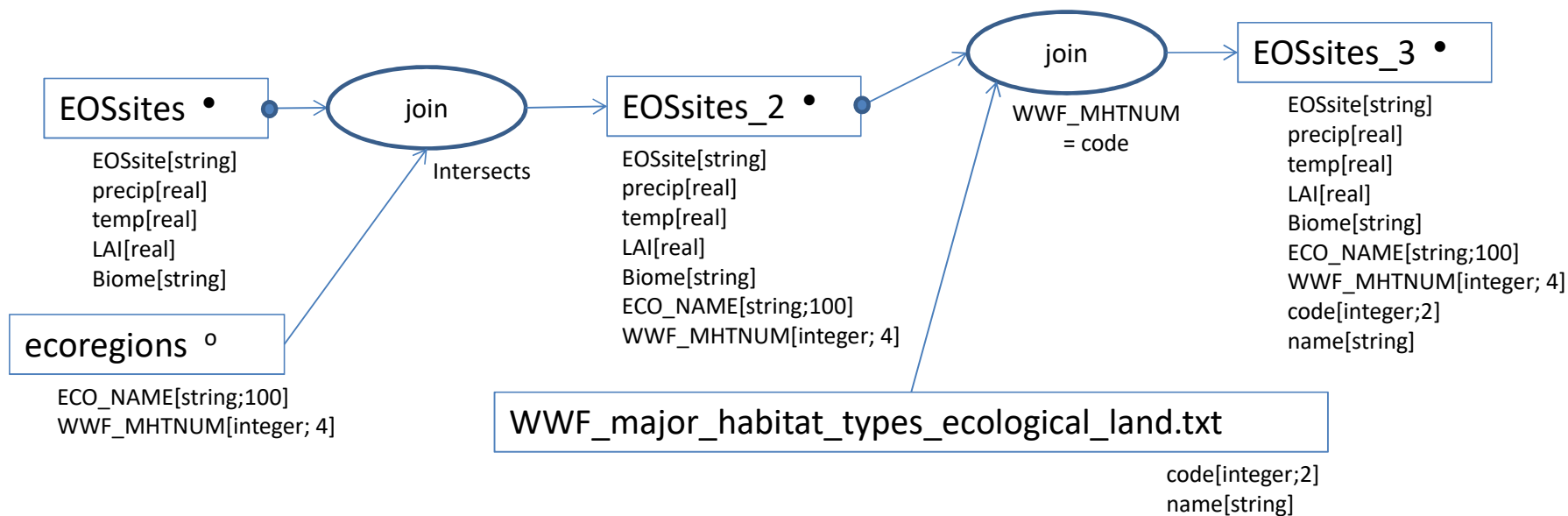
diagram_high_lakes.JPG



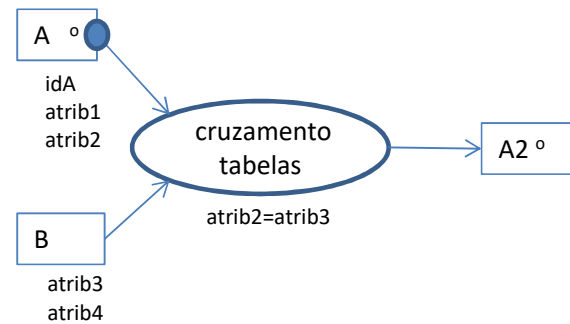
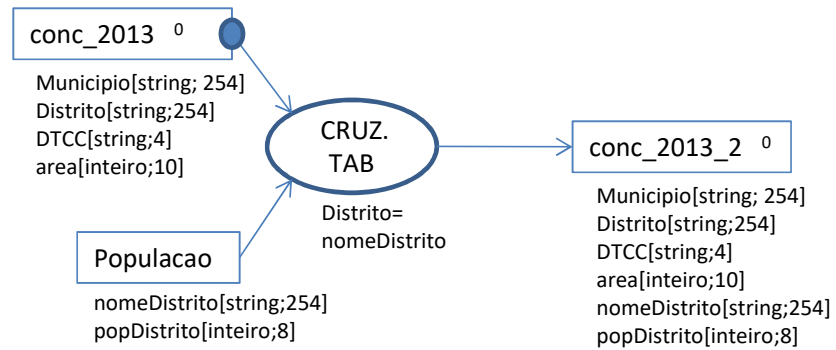
diagram_highlakes_join_countries.JPG

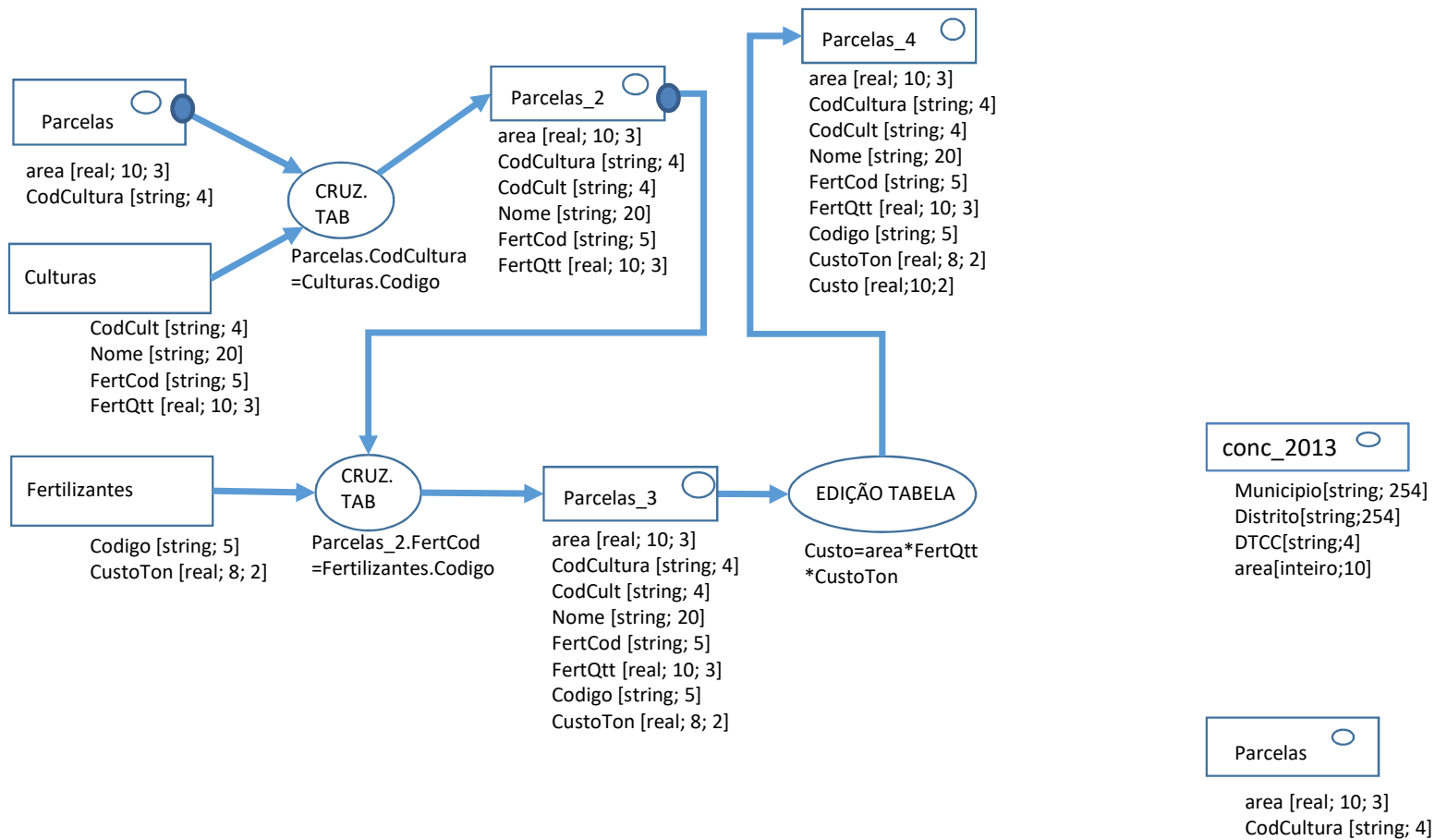


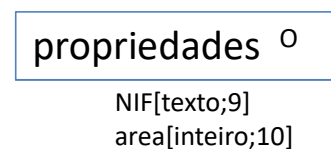
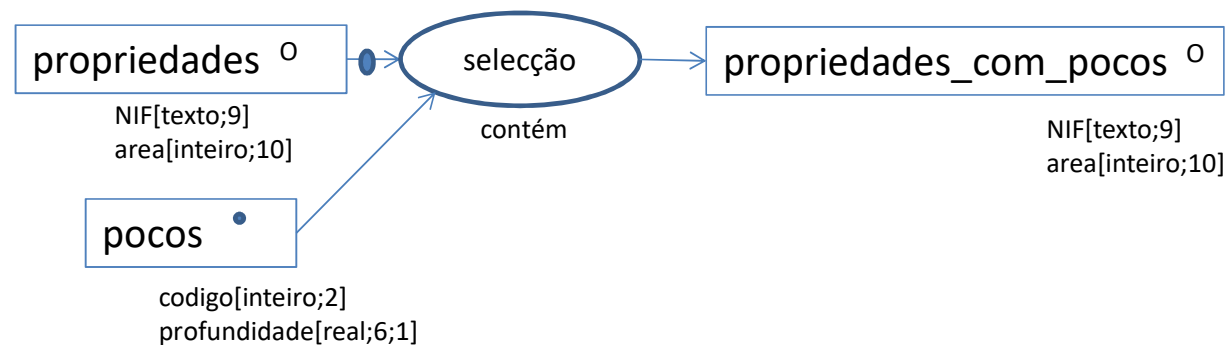
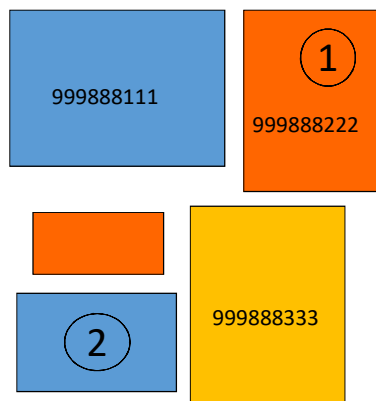
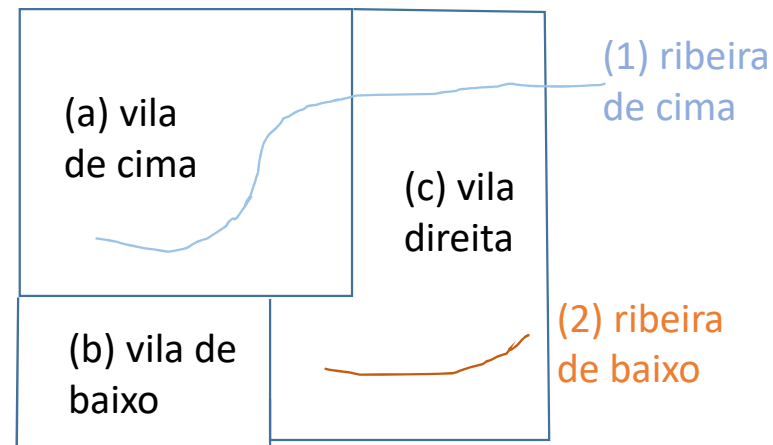
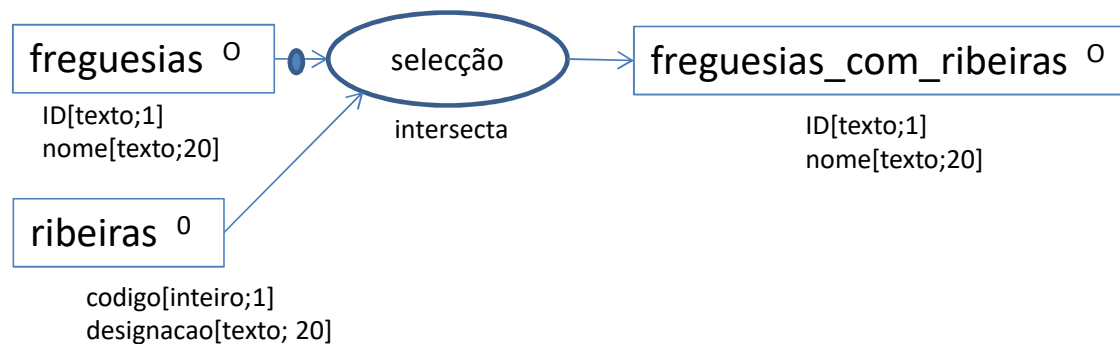
diagram_countries_join_highlakes.JPG



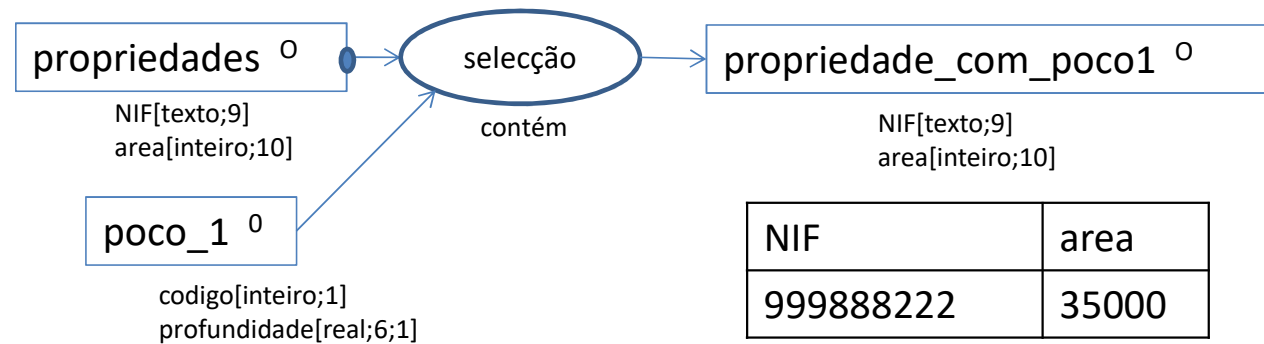
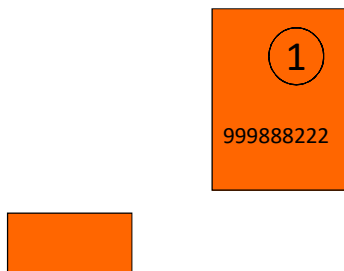
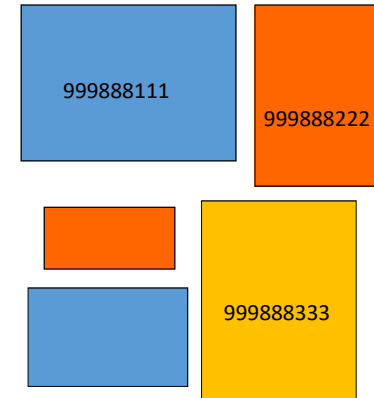
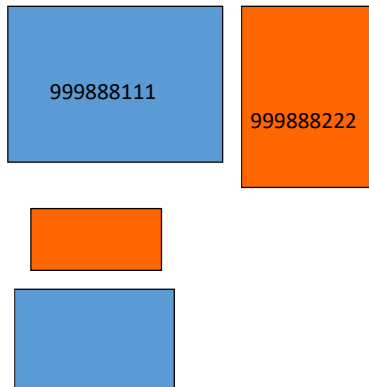
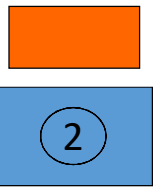
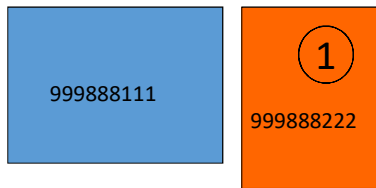
diagram_eos_join_ecoregions.JPG





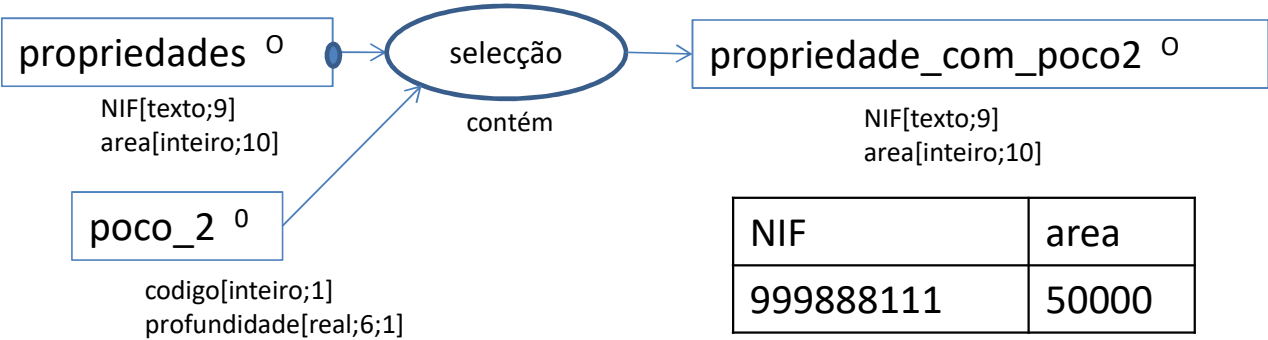


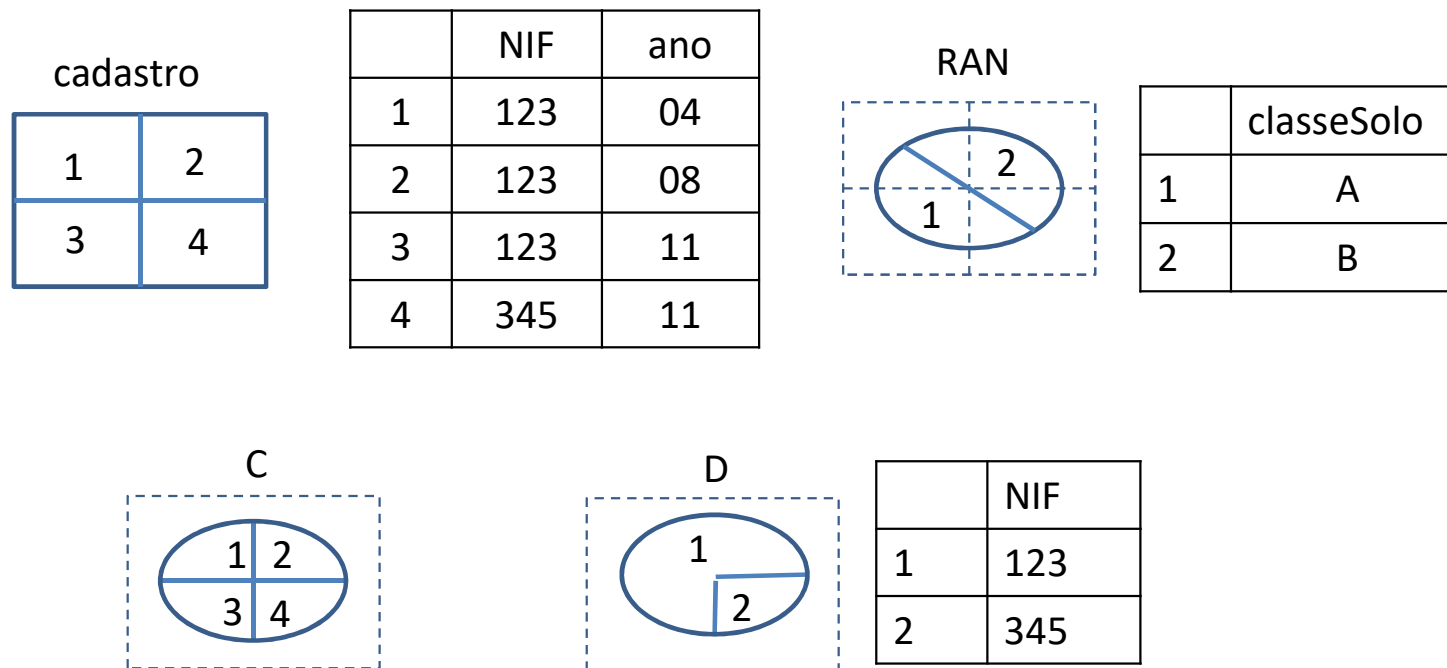
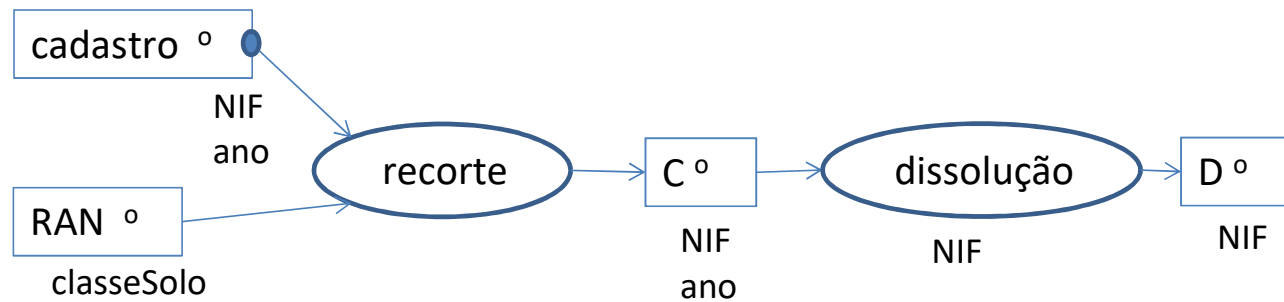
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999888222	35000

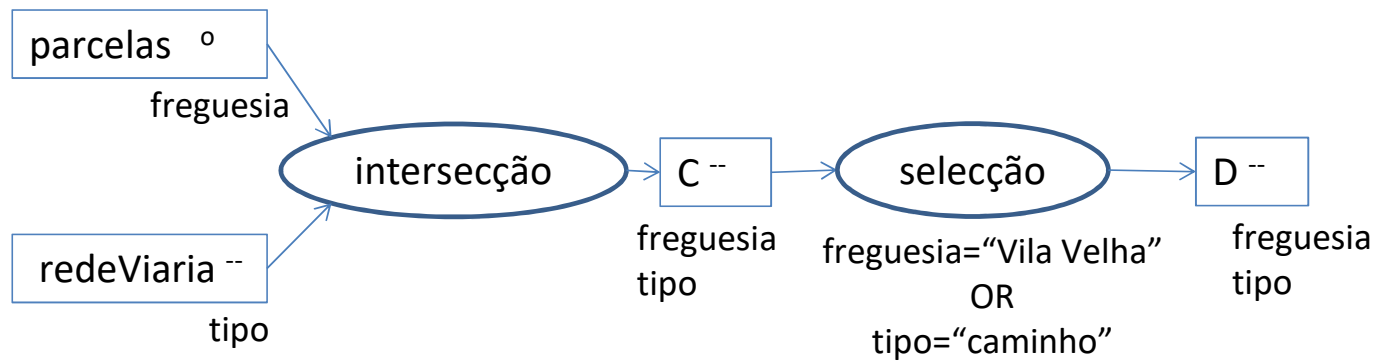


999888111

2



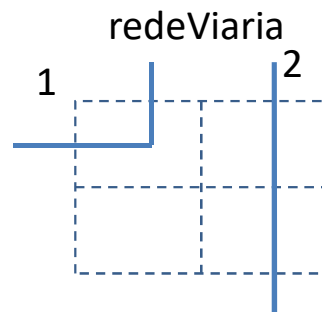




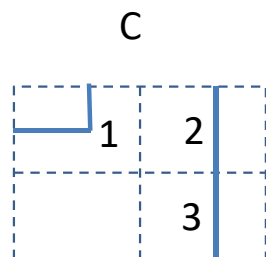
parcelas

1	2
3	4

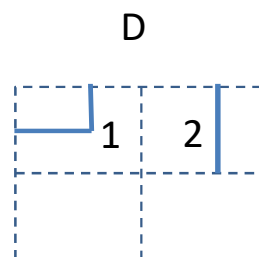
	freguesia
1	Vila Velha
2	Vila Velha
3	Vila Velha
4	Vila Nova



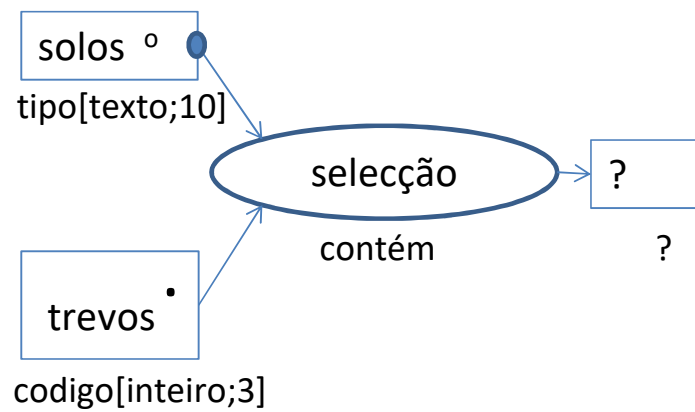
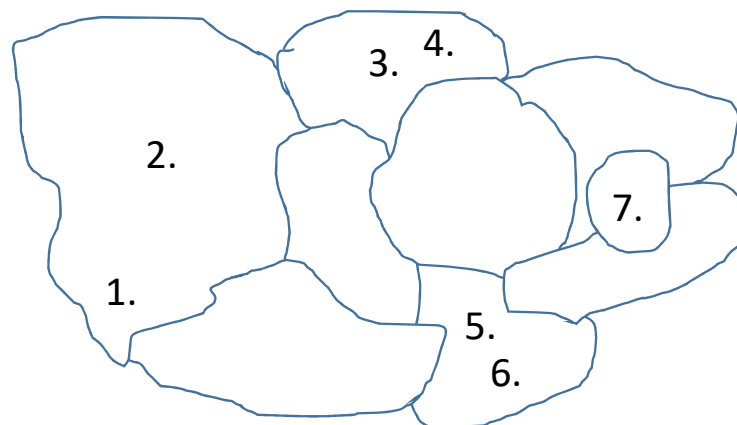
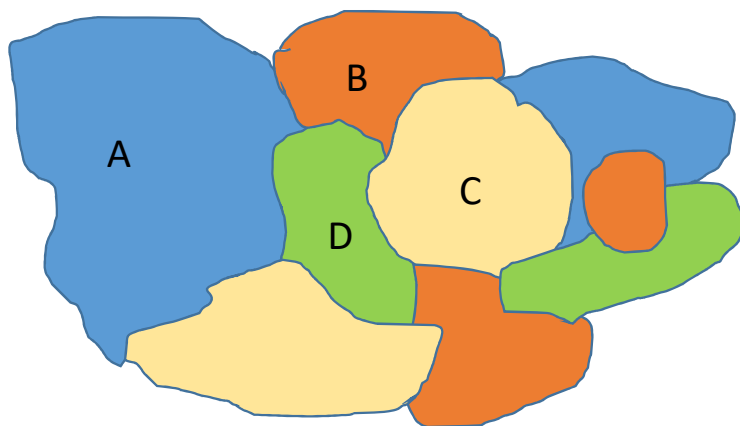
	tipo
1	caminho
2	estrada

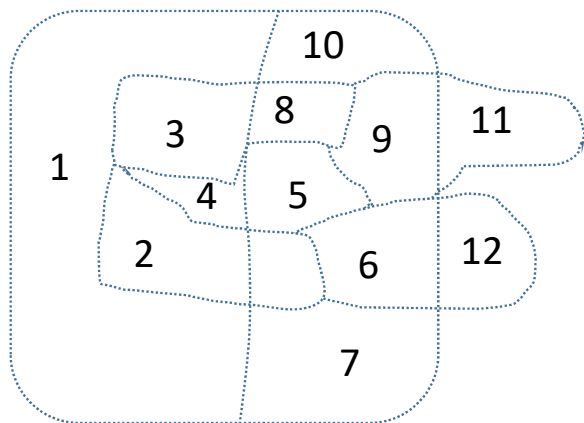
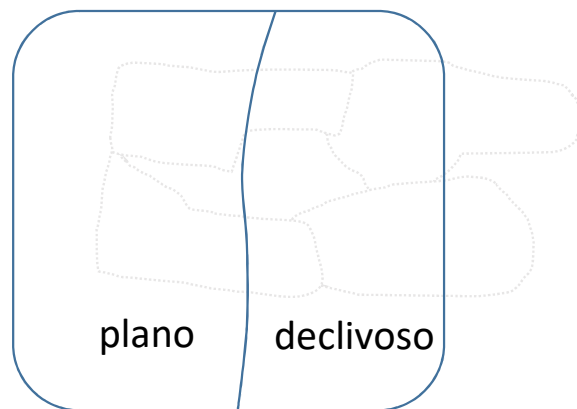
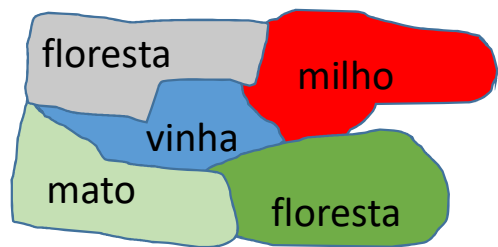


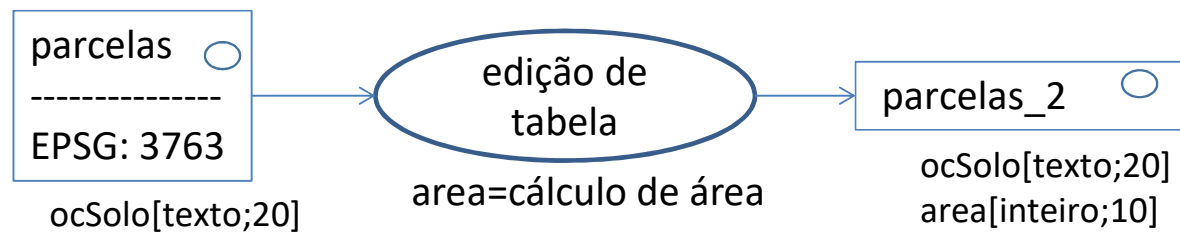
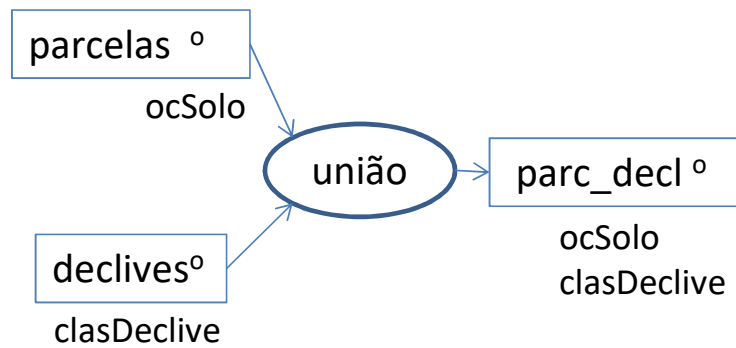
	freguesia	tipo
1	Vila Velha	caminho
2	Vila Velha	estrada
3	Vila Nova	estrada

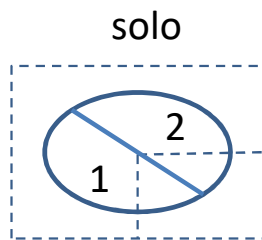
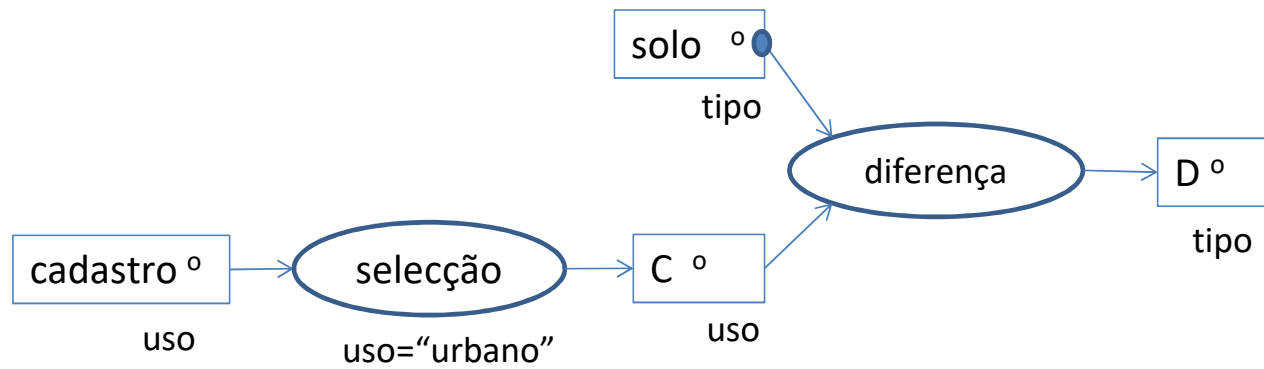


	freguesia	tipo
1	Vila Velha	caminho
2	Vila Velha	estrada

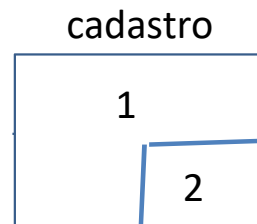




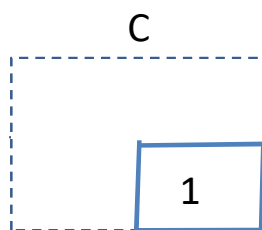




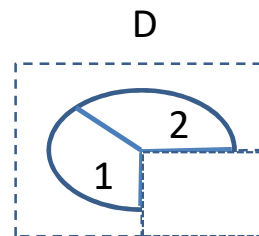
	tipo
1	arenoso
2	argiloso



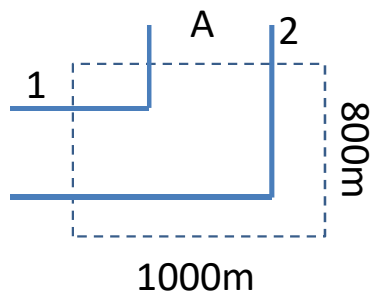
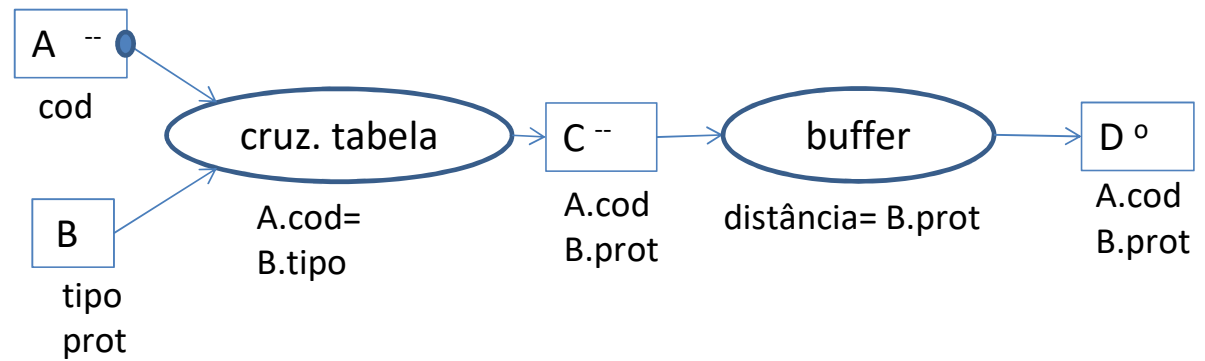
	uso
1	agrícola
2	urbano



	uso
1	urbano

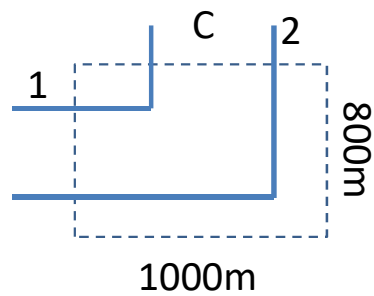


	tipo
1	arenoso
2	argiloso

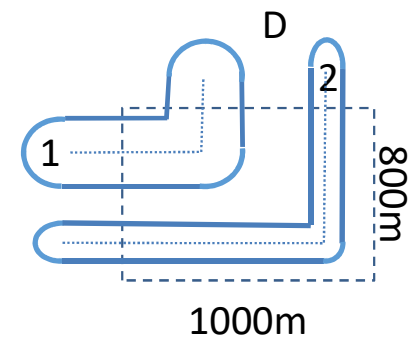


	cod
1	M
2	S

B	
tipo	prot
T	50
M	200
Q	25
S	100



	A.cod	B.prot
1	M	200
2	S	100



propriedades °

artigo[texto;9]
area[inteiro;10]

101345111

101345222

101345333

artigo	area
101345111	50000
101345222	35000
101345333	40000

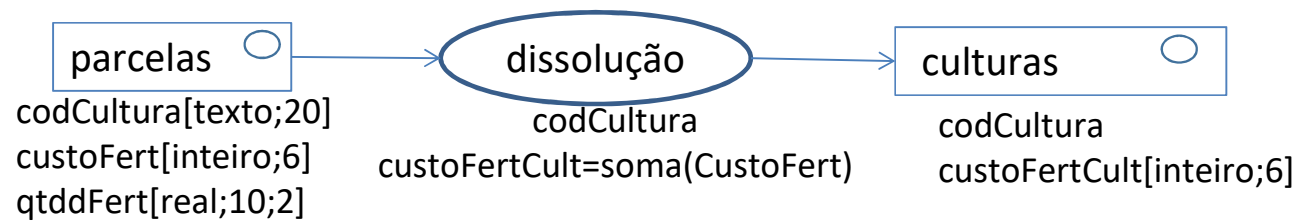
parcelas °

freguesia[texto;50]

parcelas

1	2
3	4

	freguesia
1	Vila Velha
2	Vila Velha
3	Vila Velha
4	Vila Nova



A

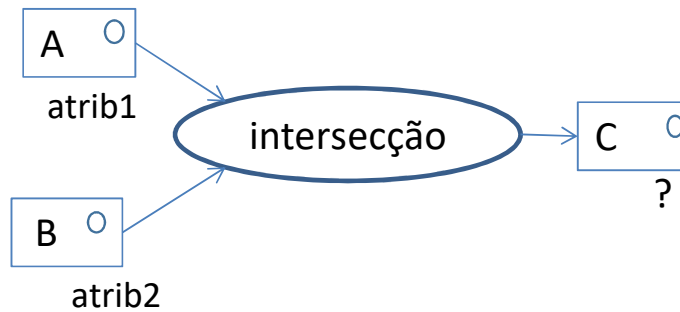
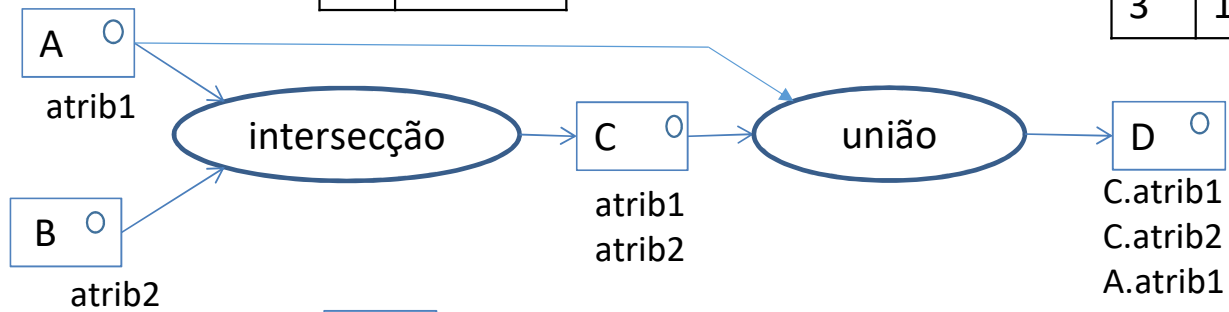
1	2
3	

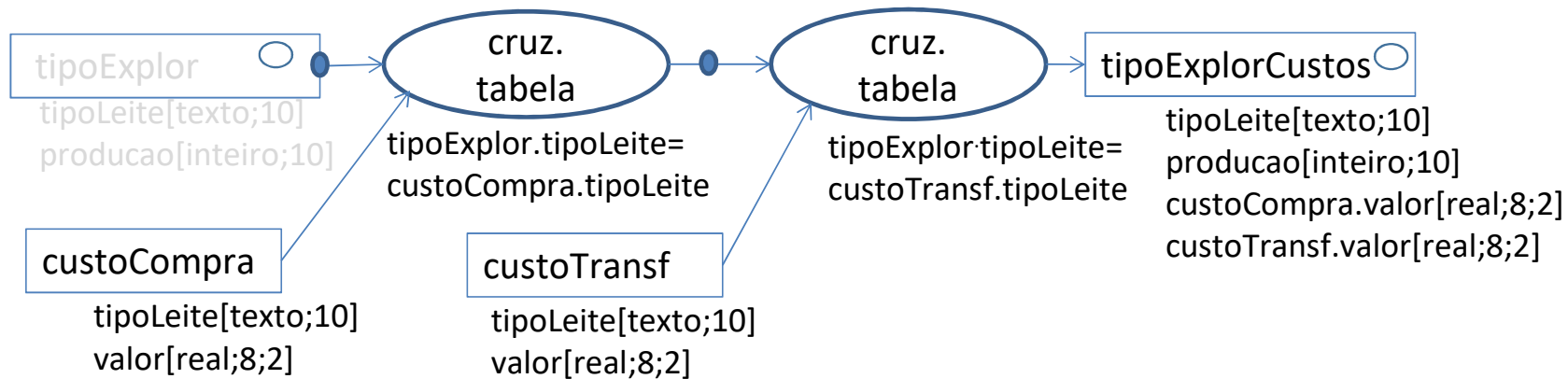
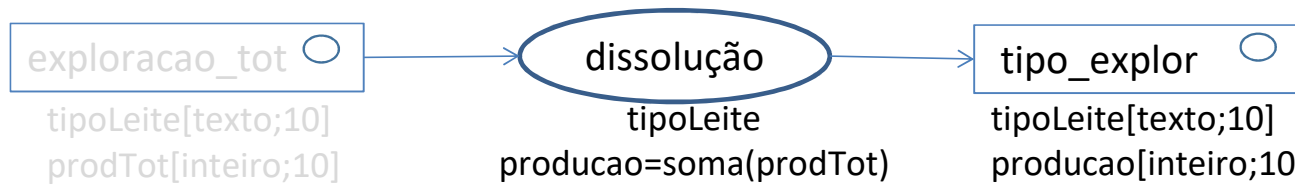
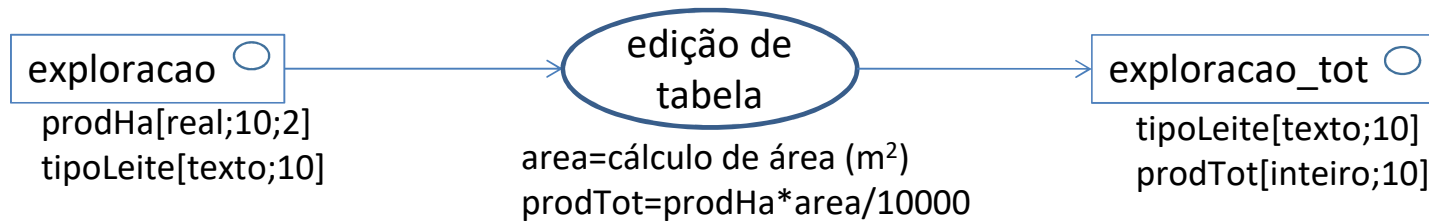
	atrib1
1	a
2	b
3	b

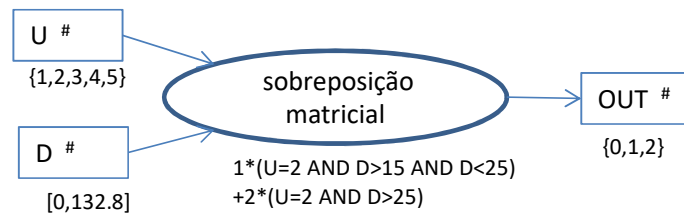
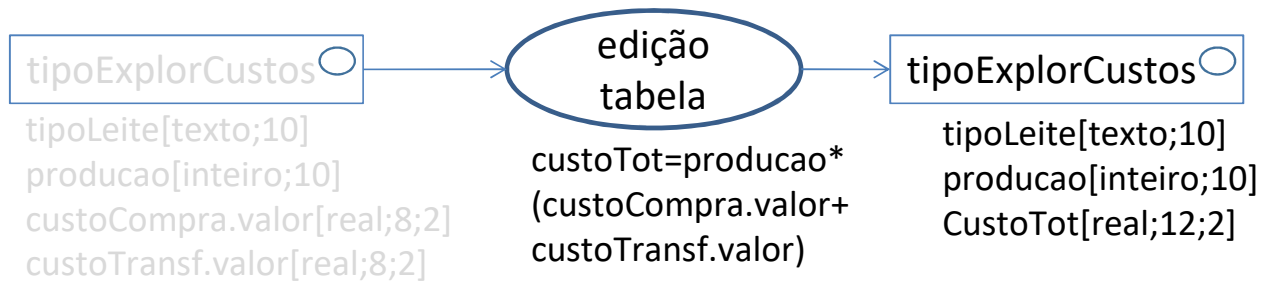
B

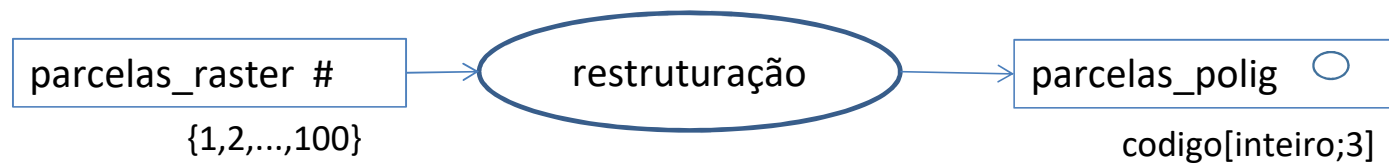
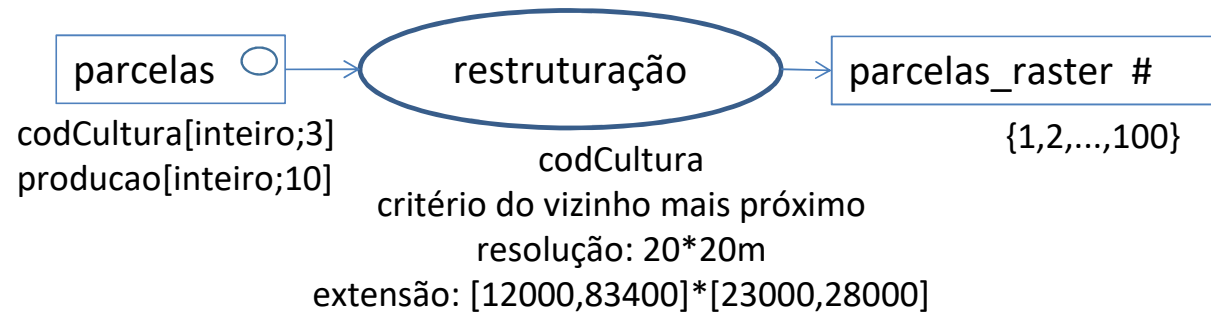
1	2
2	3
3	1

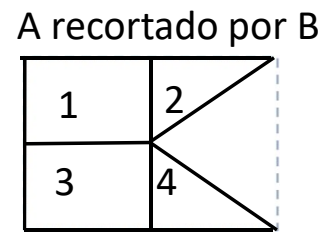
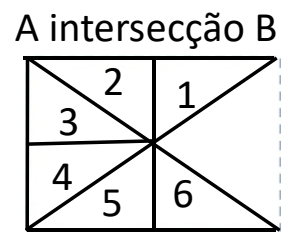
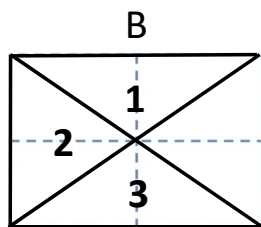
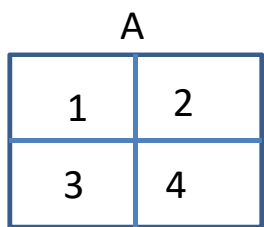
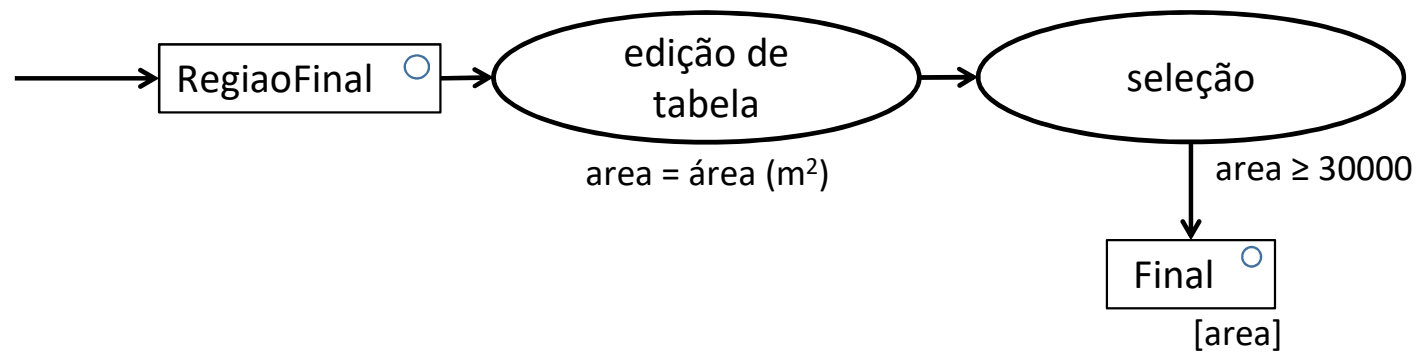
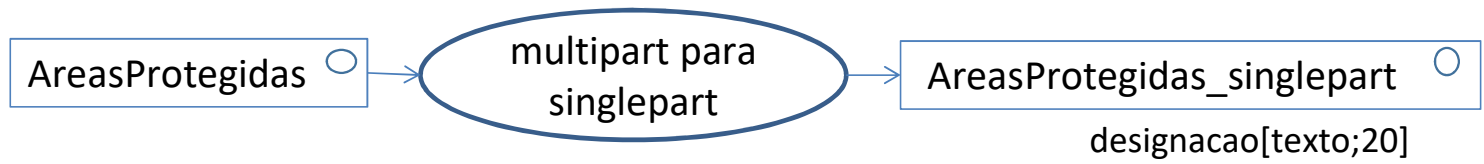
	atrib2
1	10
2	15
3	10



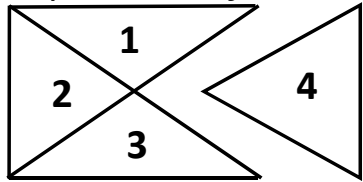




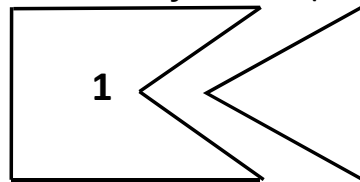




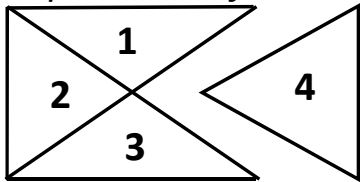
input com 4 features



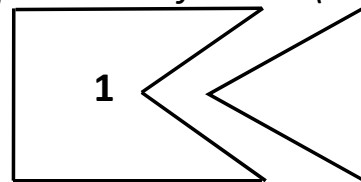
output com 1 feature (multipart)

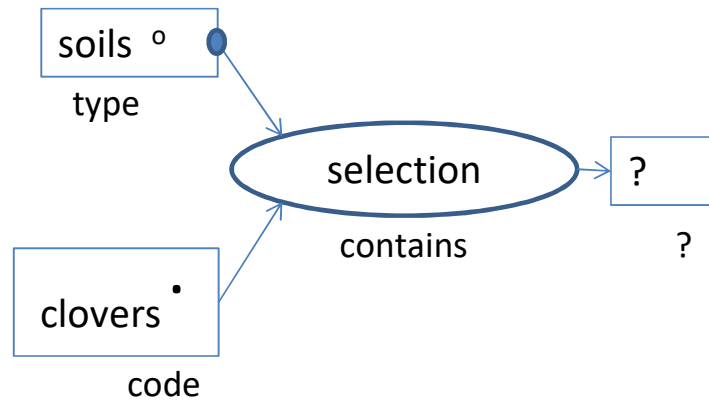
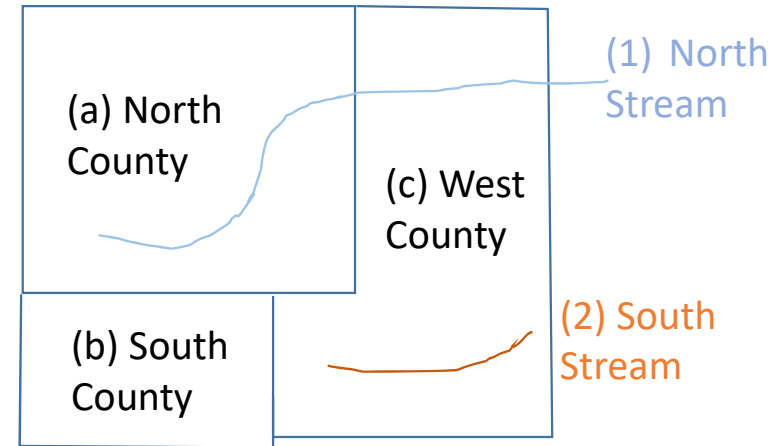
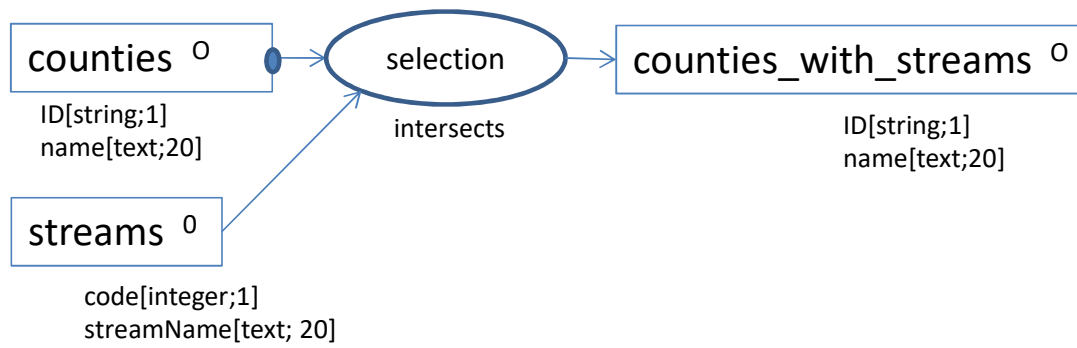


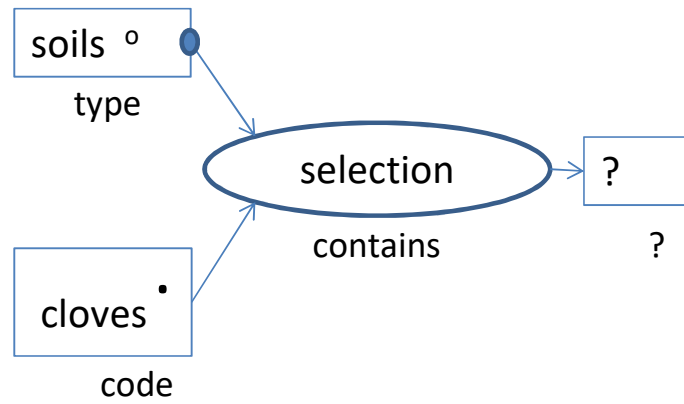
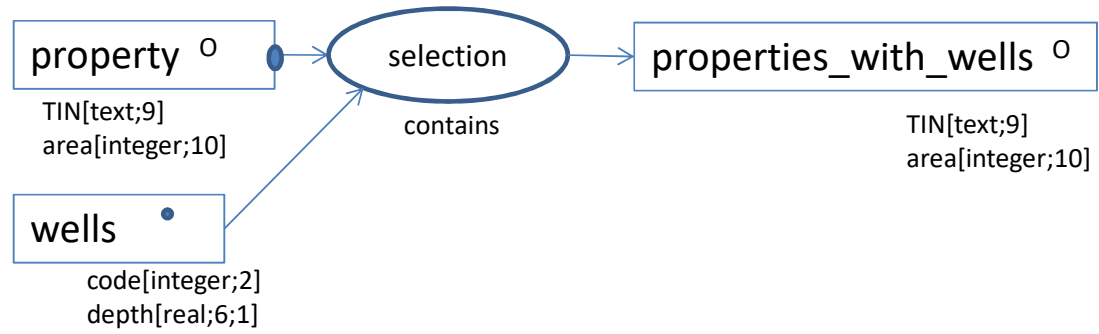
input with 4 features



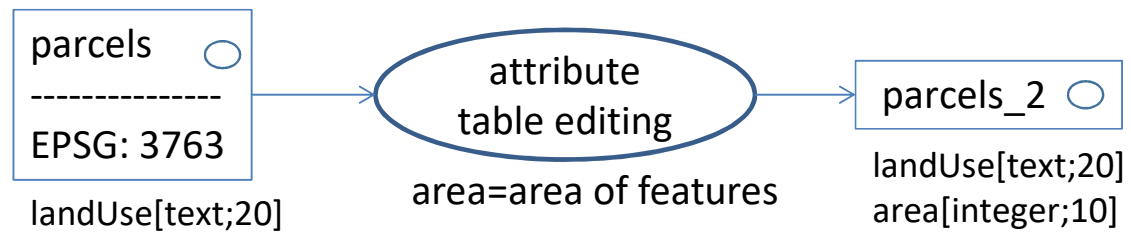
output with 1 feature (multipart)

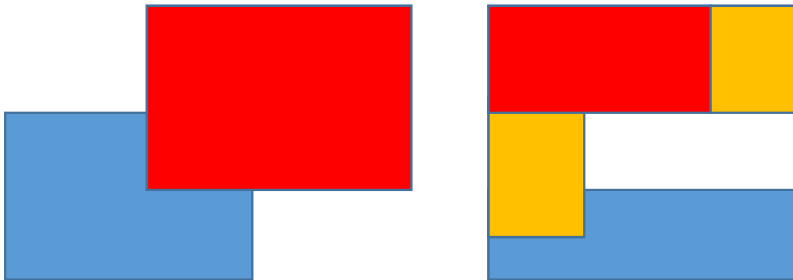
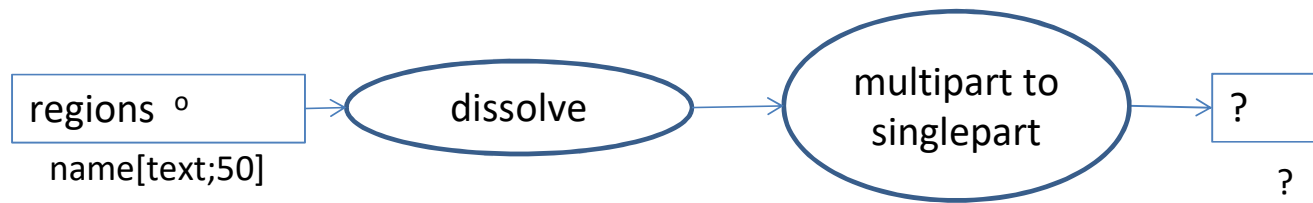


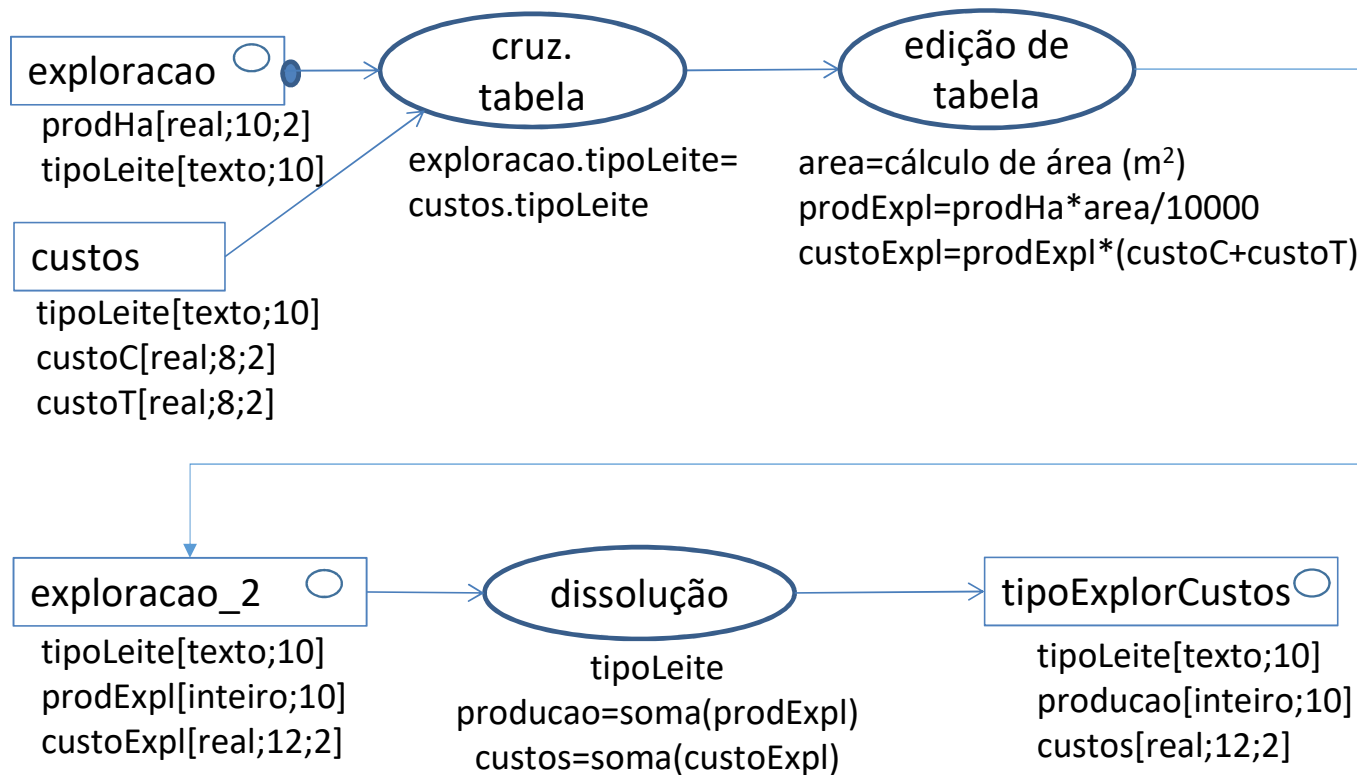




diagram_compute_area_epsg_3763.PNG







A

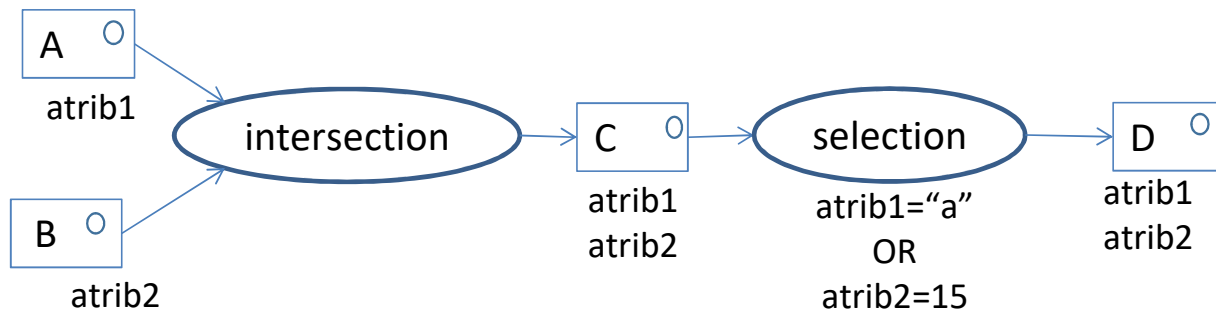
1	2
3	

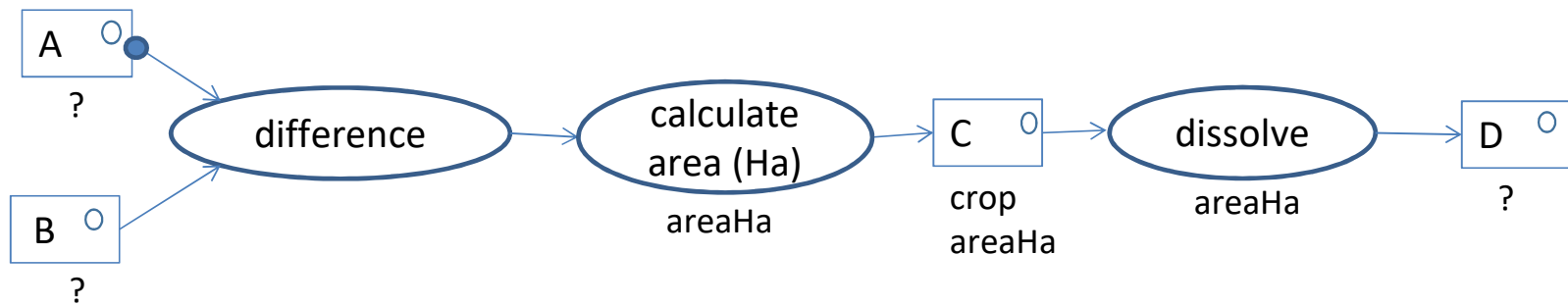
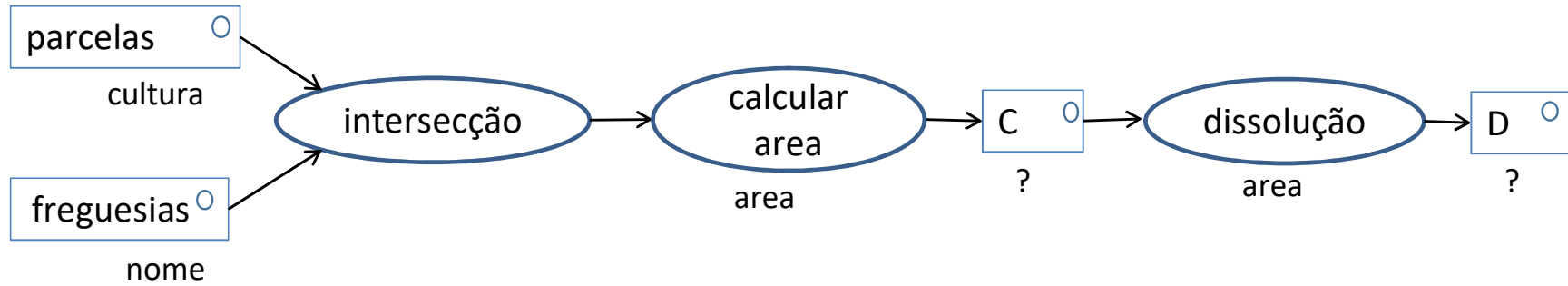
	atrib1
1	a
2	b
3	b

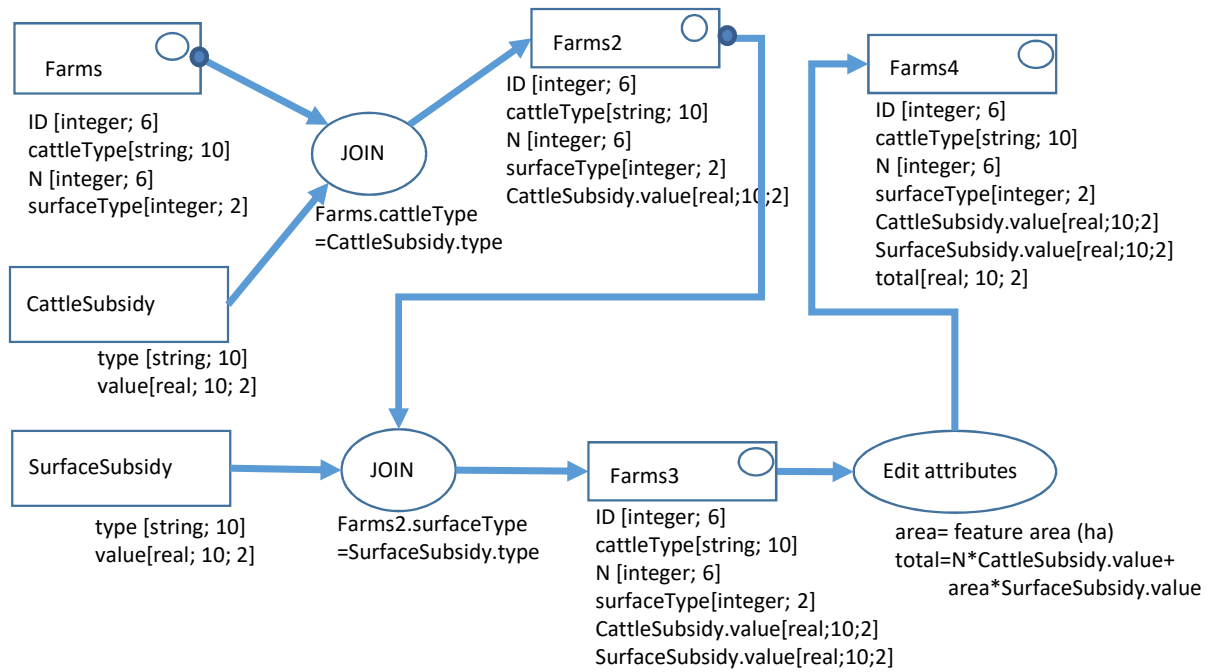
B

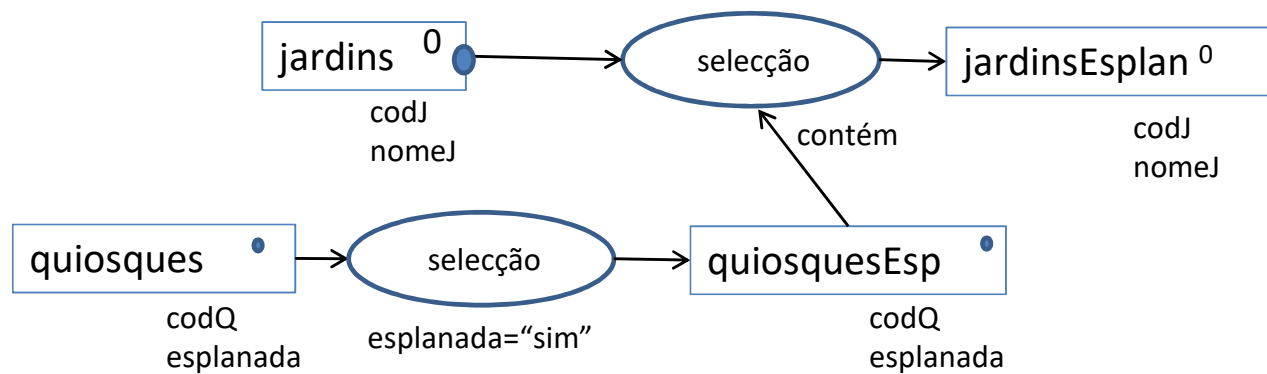
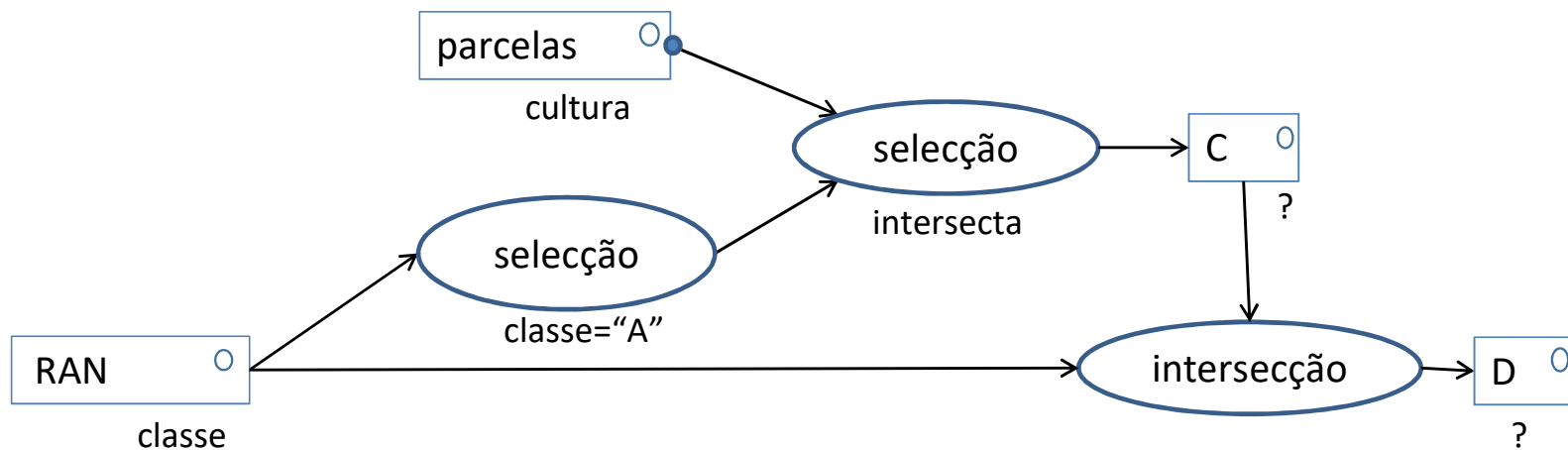
1	
2	
3	

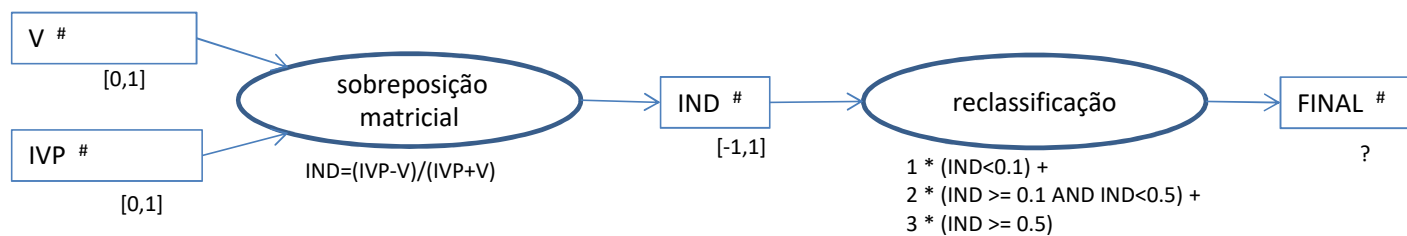
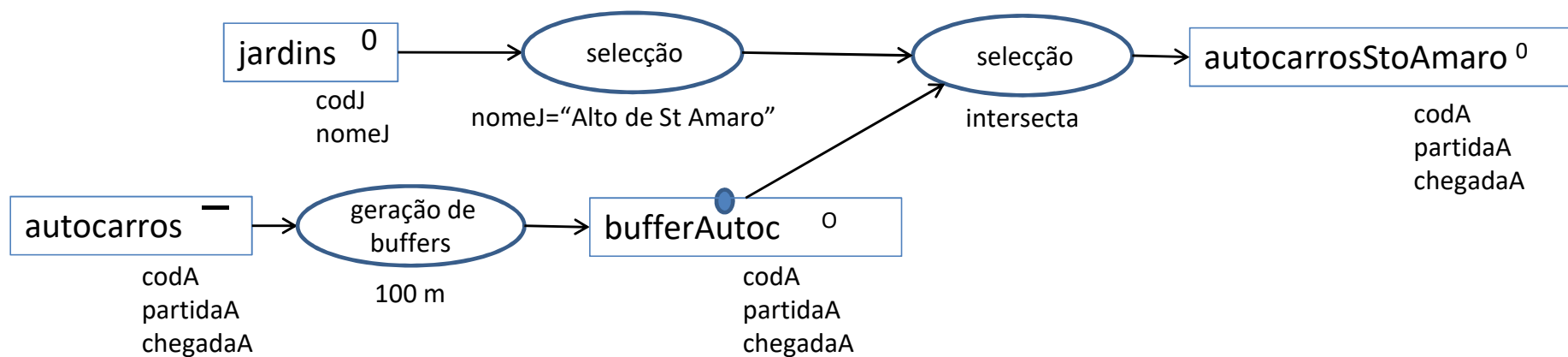
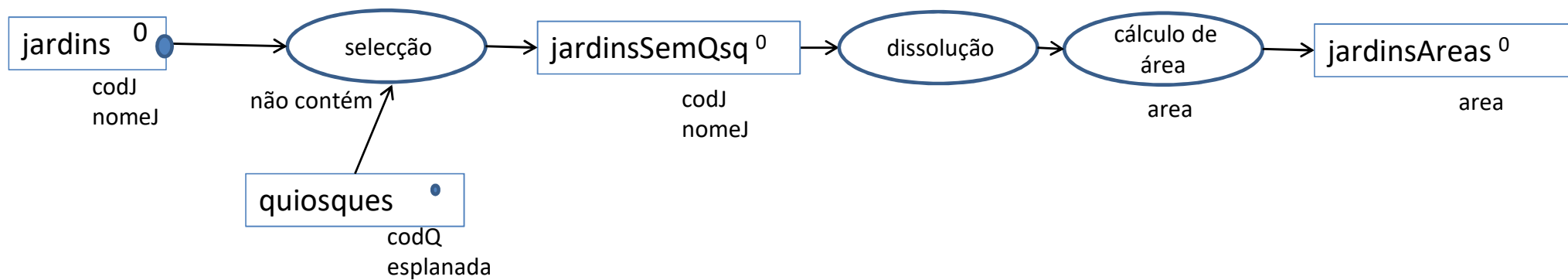
	atrib2
1	10
2	15
3	10

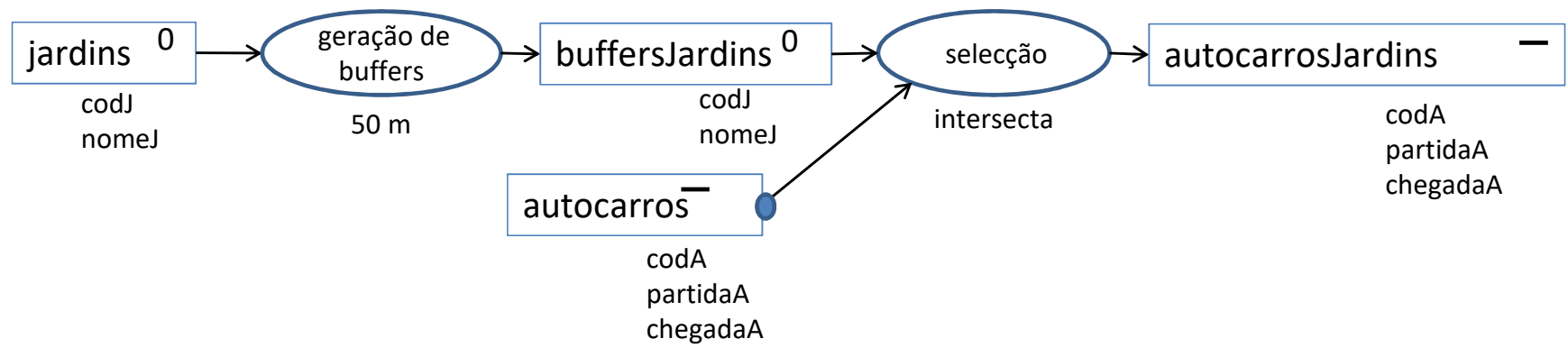


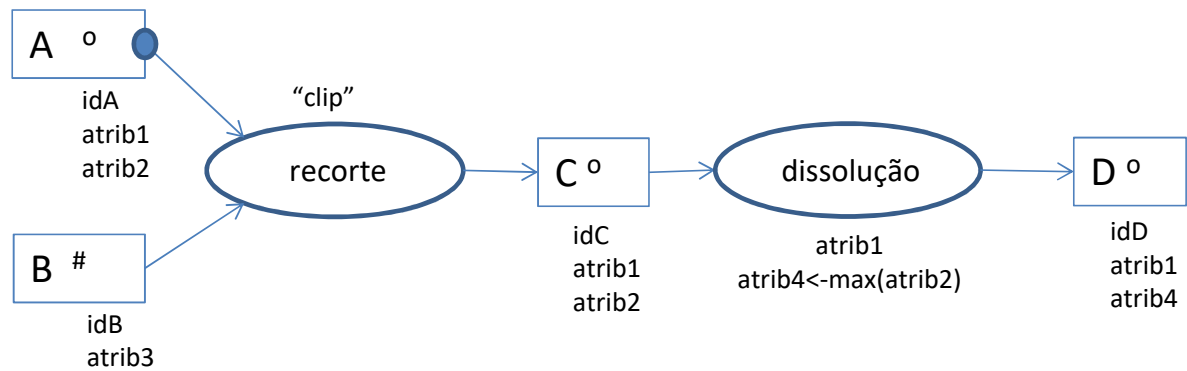




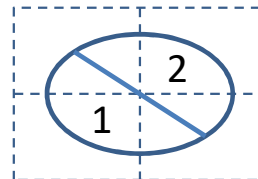






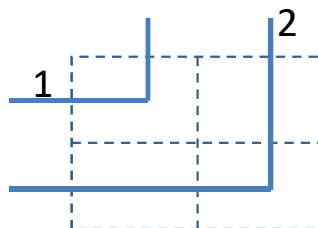
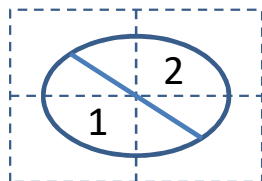
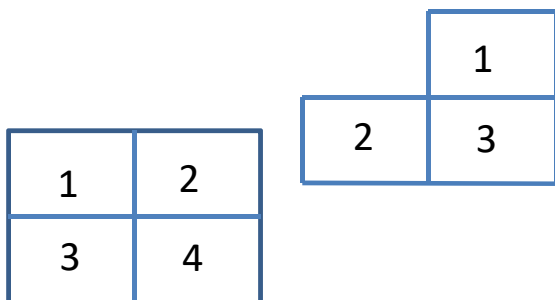
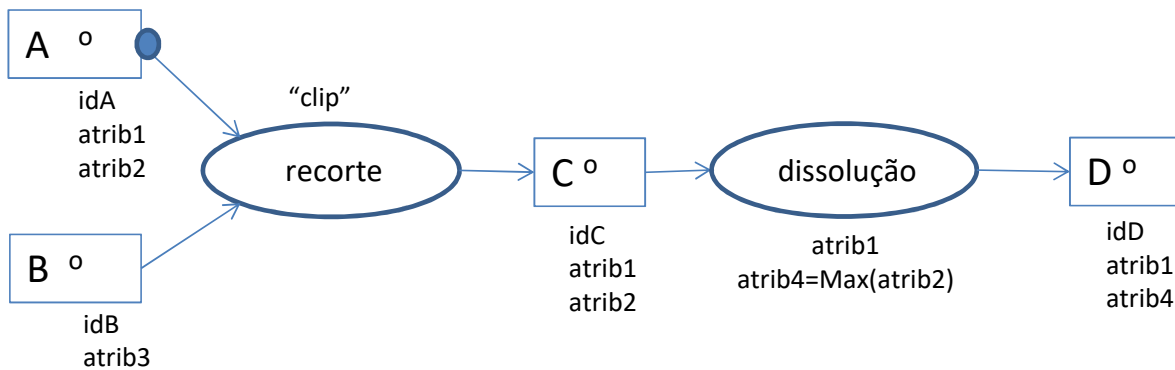


1	2
3	4



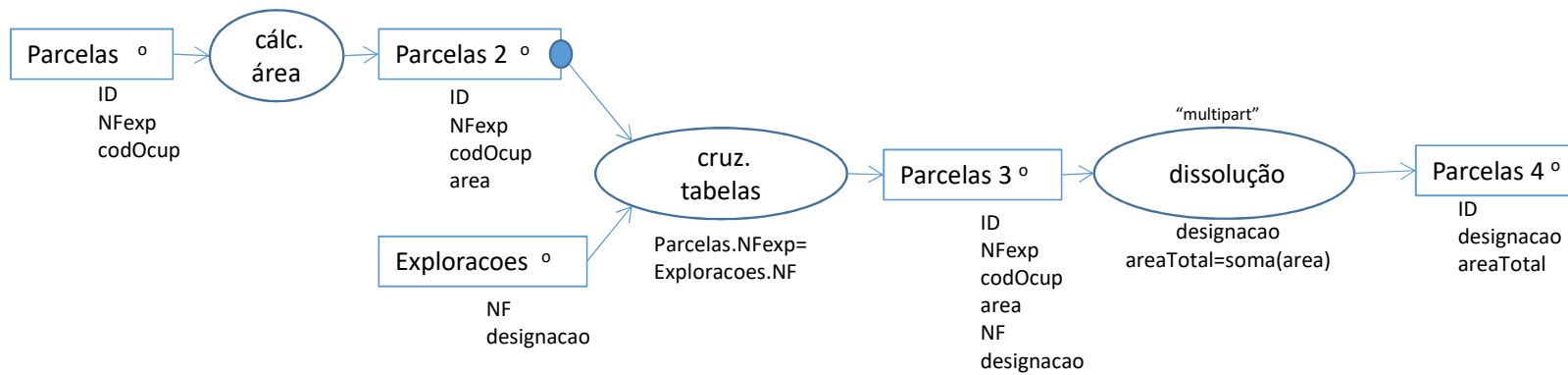
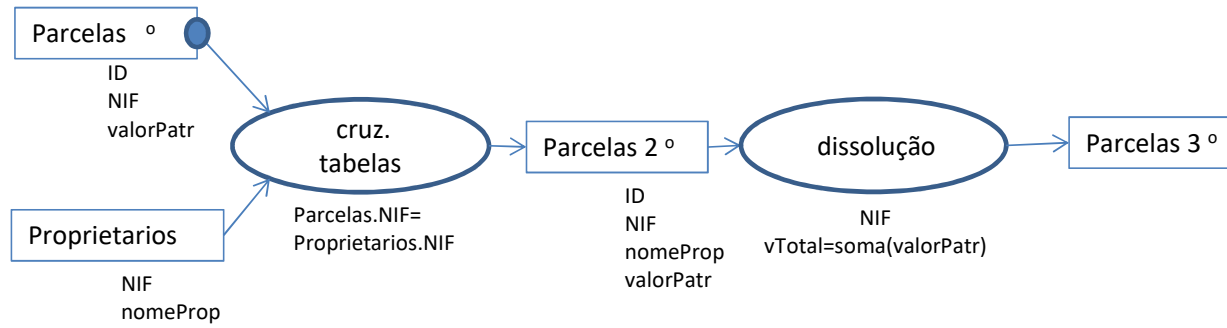
idA	atrib1	atrib2
1	X	4
2	X	3
3	X	6
4	Y	11

idB	atrib3
1	4
2	-2



idA	atrib1	atrib2
1	X	4
2	X	3
3	X	6
4	Y	11

idB	atrib3
1	A1
2	N10

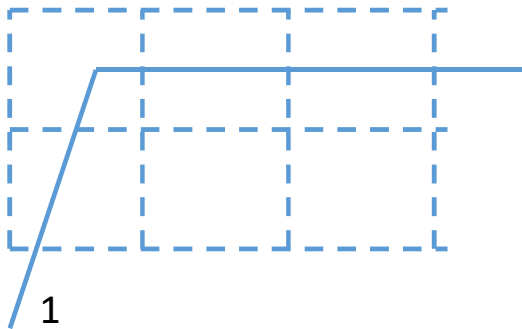


Parcels

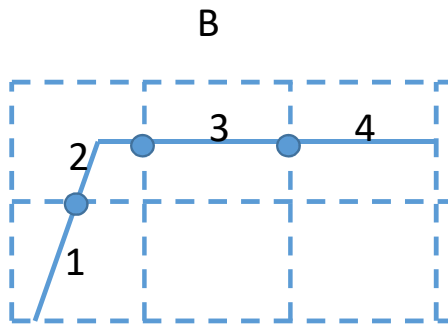
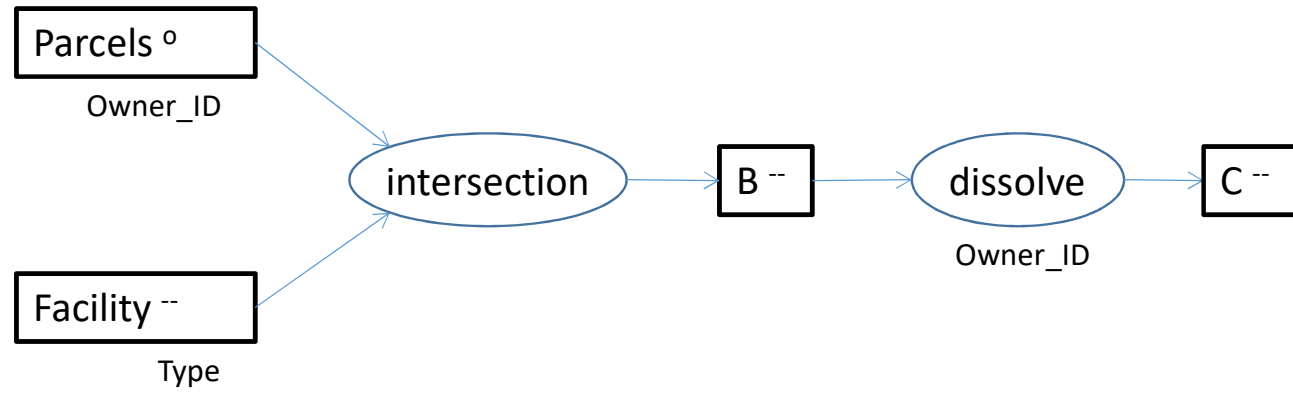
1	2	3
4	5	6

	Owner_ID
1	205
2	202
3	202
4	201
5	201
6	202

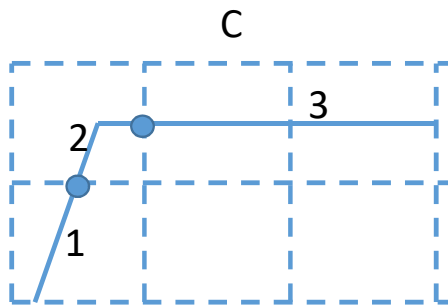
Facility



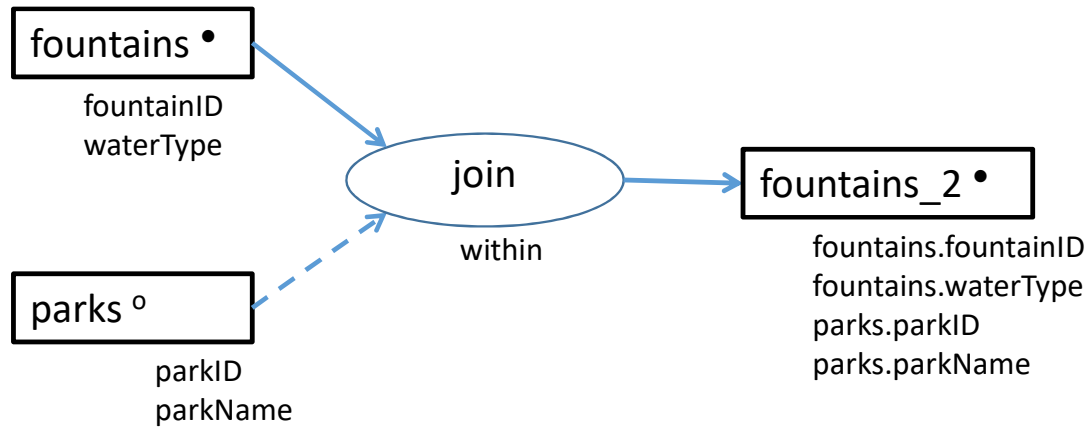
	Type
1	A

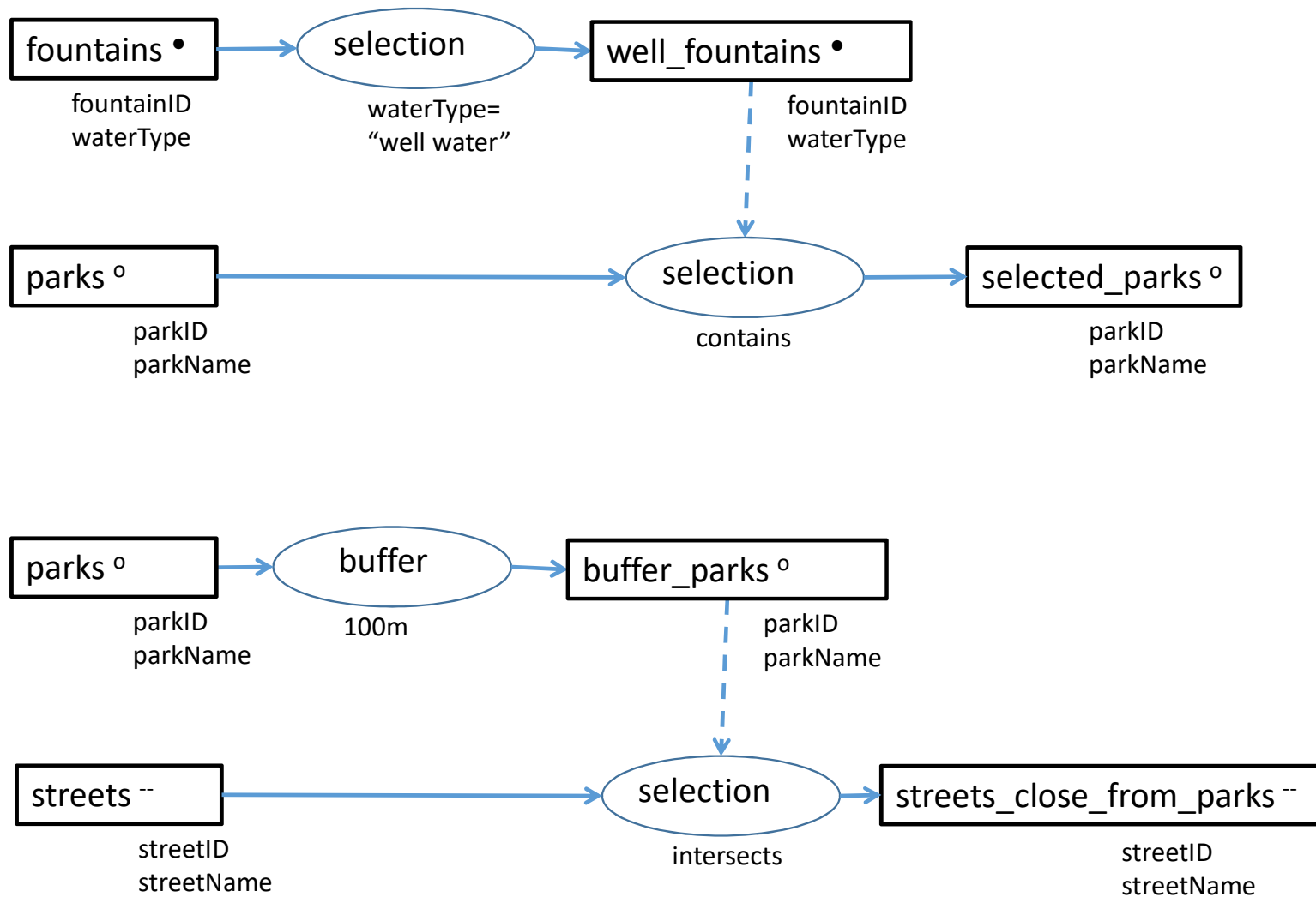


	Owner_ID	Type
1	201	A
2	205	A
3	202	A
4	202	A



	Owner_ID
1	201
2	205
3	202





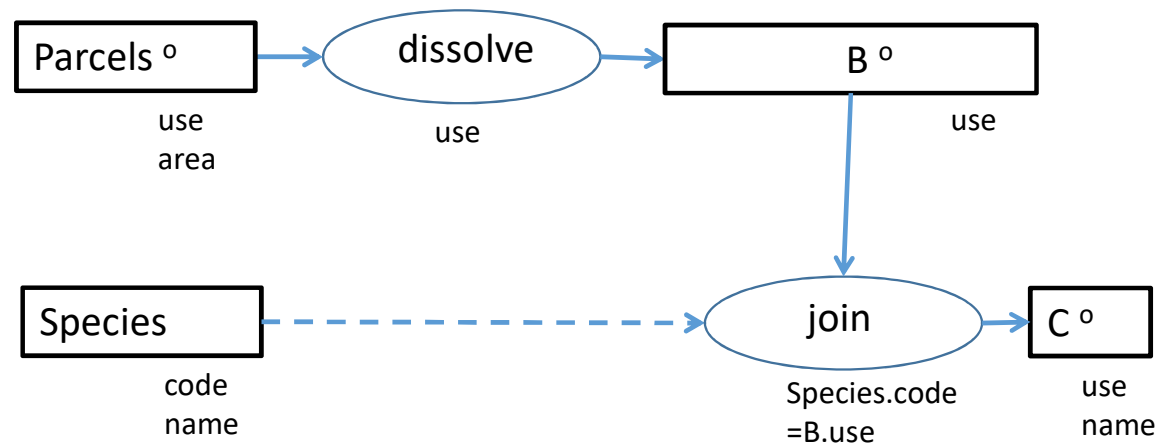
Parcels

1	3	5
2	4	

	use	area
1	c1	100
2	c2	100
3	c1	120
4	c2	80
5	c3	200

Species

code	name
c1	pine
c2	eucalyptus
c3	poplar

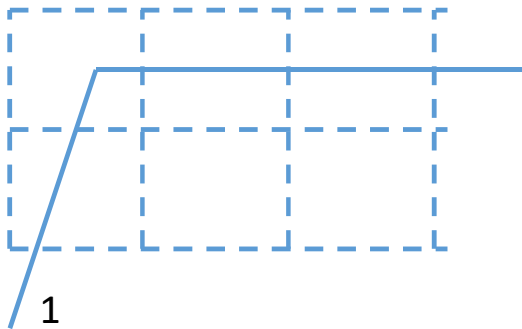


Parcels

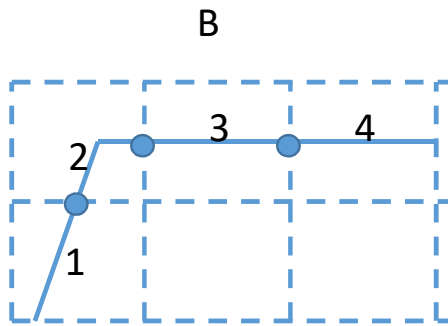
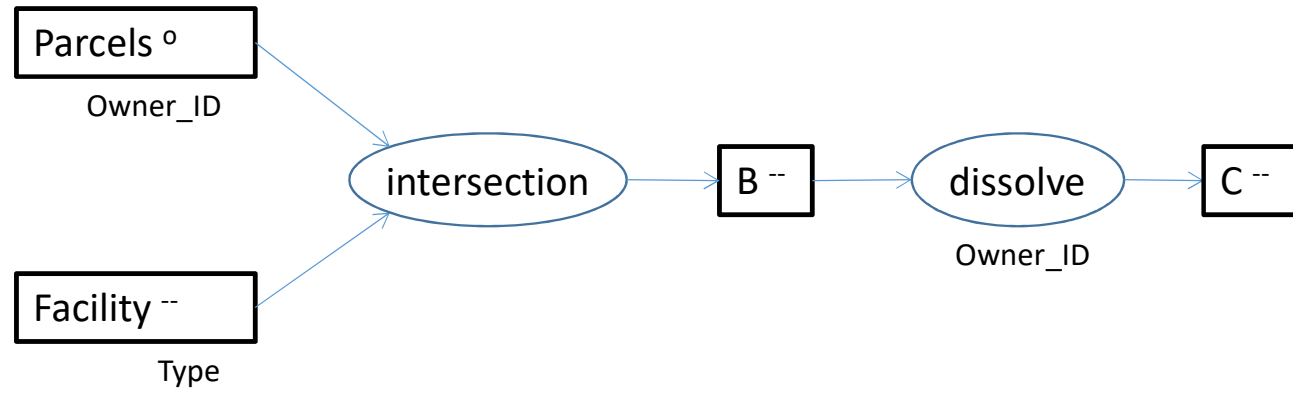
1	2	3
4	5	6

	Owner_ID
1	205
2	202
3	202
4	201
5	201
6	202

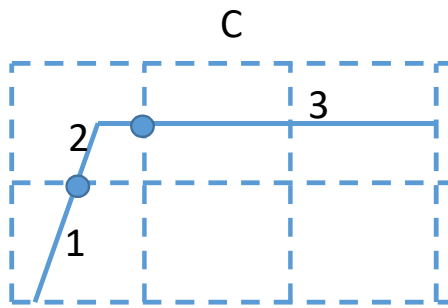
Facility



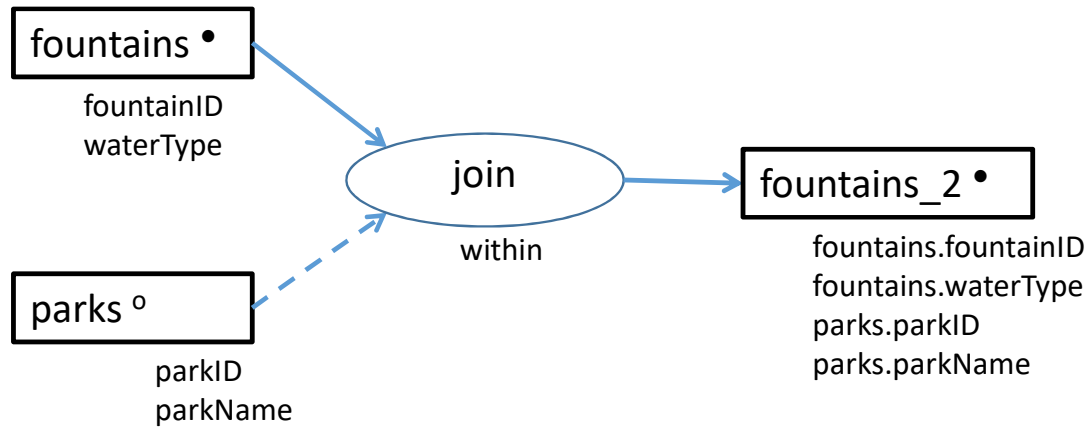
	Type
1	A

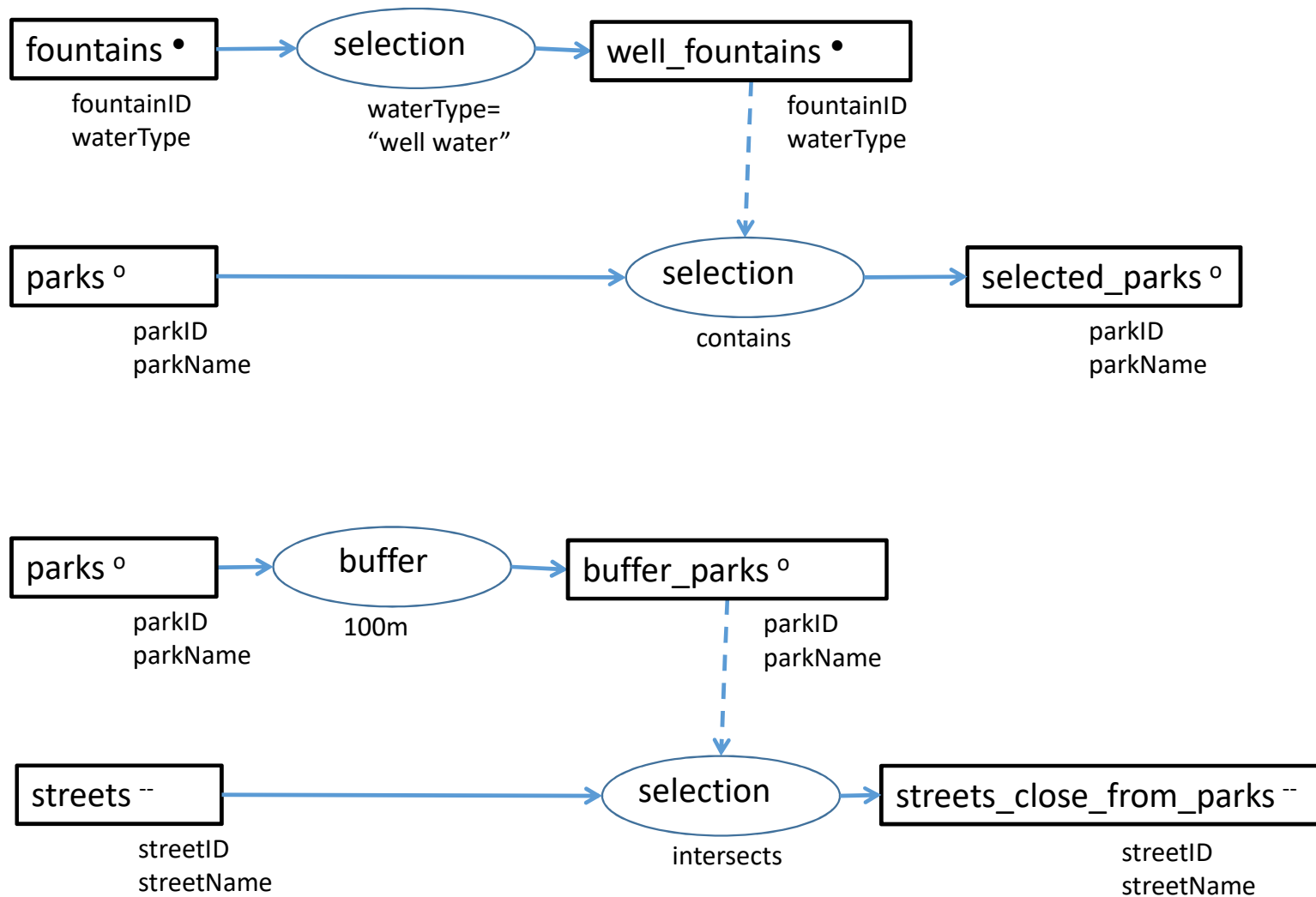


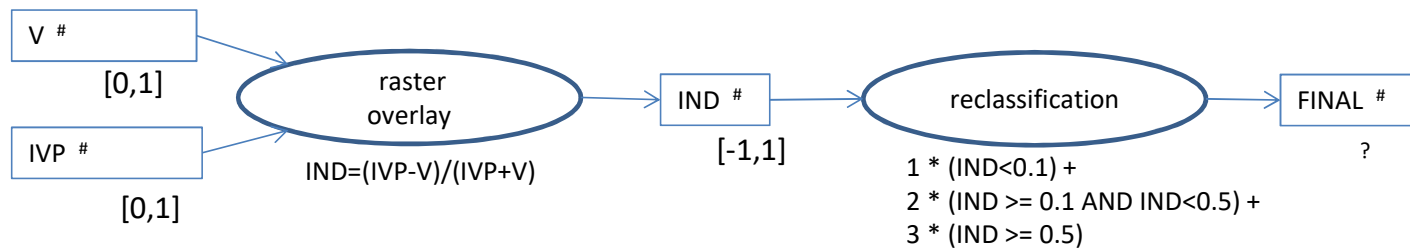
	Owner_ID	Type
1	201	A
2	205	A
3	202	A
4	202	A

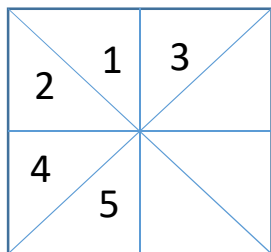


	Owner_ID
1	201
2	205
3	202

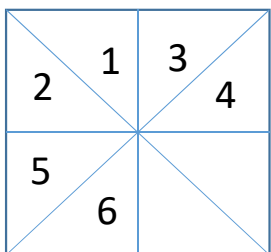
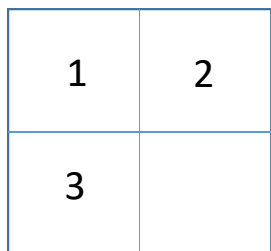




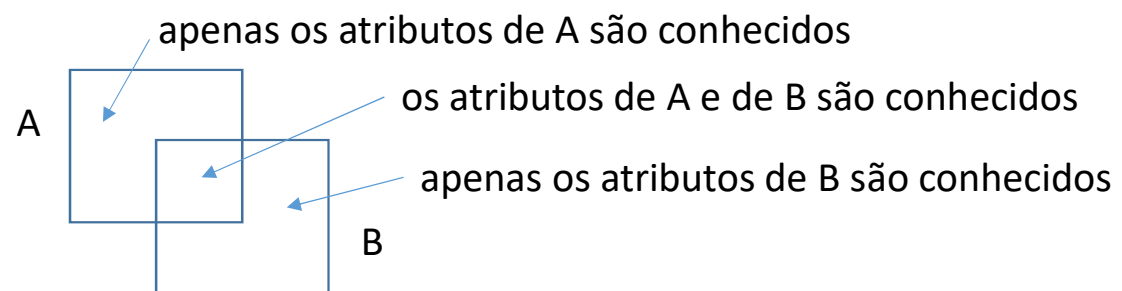


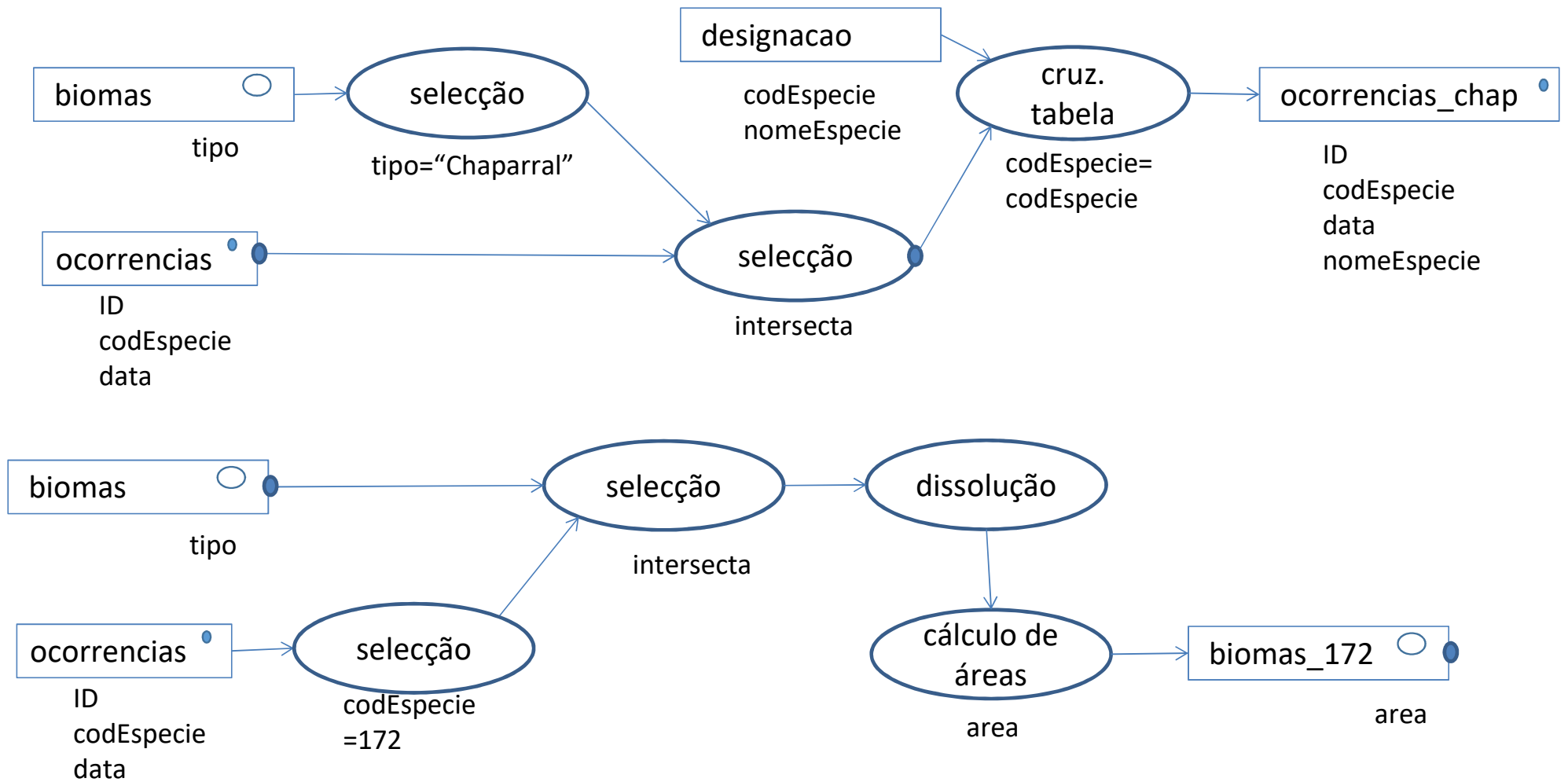


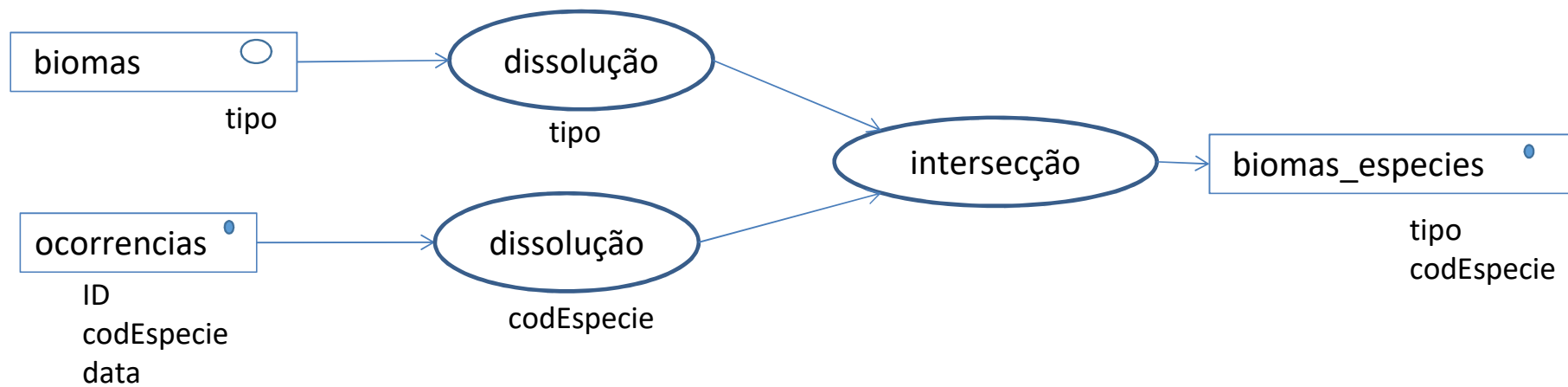
	atrib1	atrib2
1	a	10
2	a	15
3	b	10
4	b	15
5	b	10

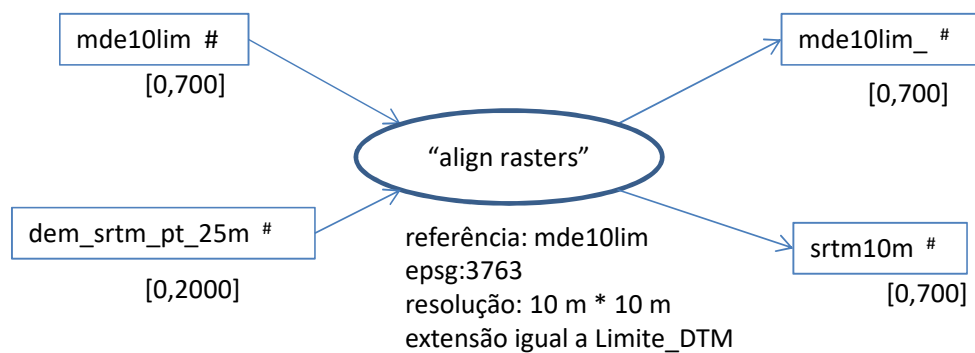
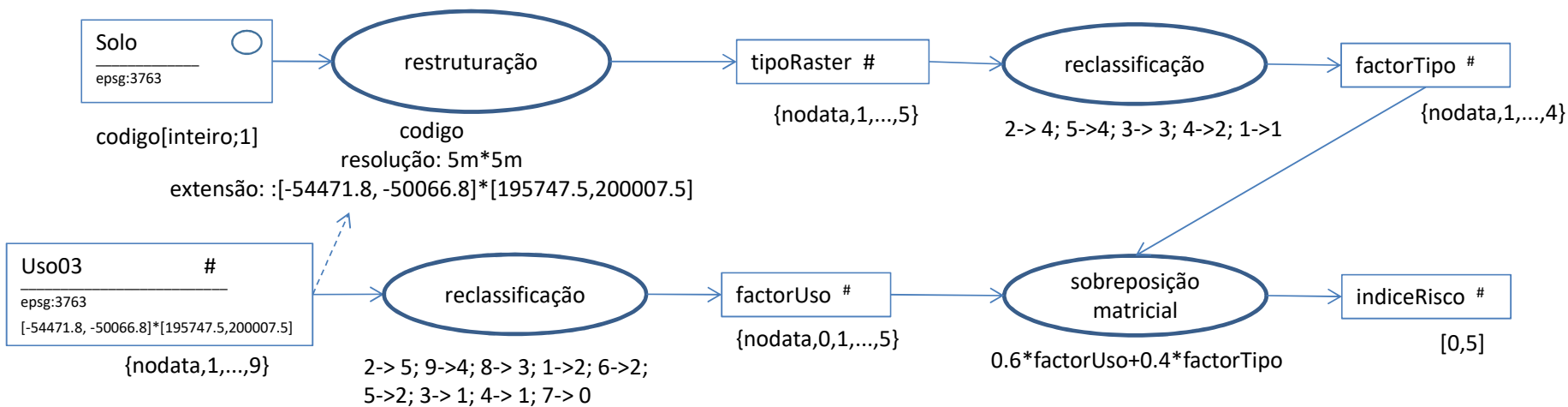


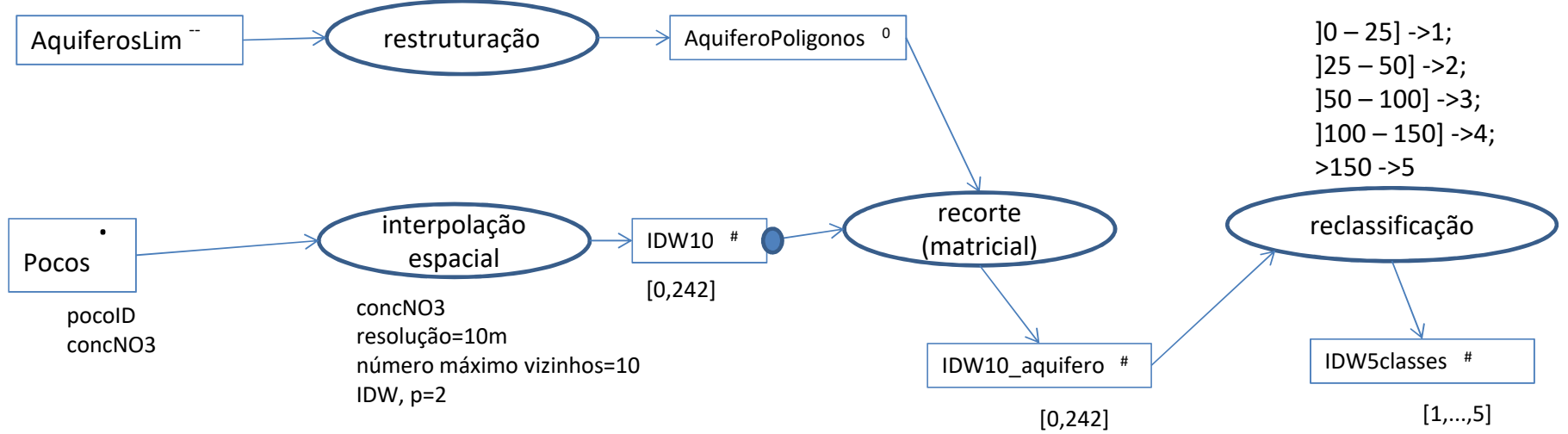
	C.atrib1	C.atrib2	A.atrib1
1	a	10	a
2	a	15	a
3	b	10	b
4			b
5	b	15	b
6	b	10	b

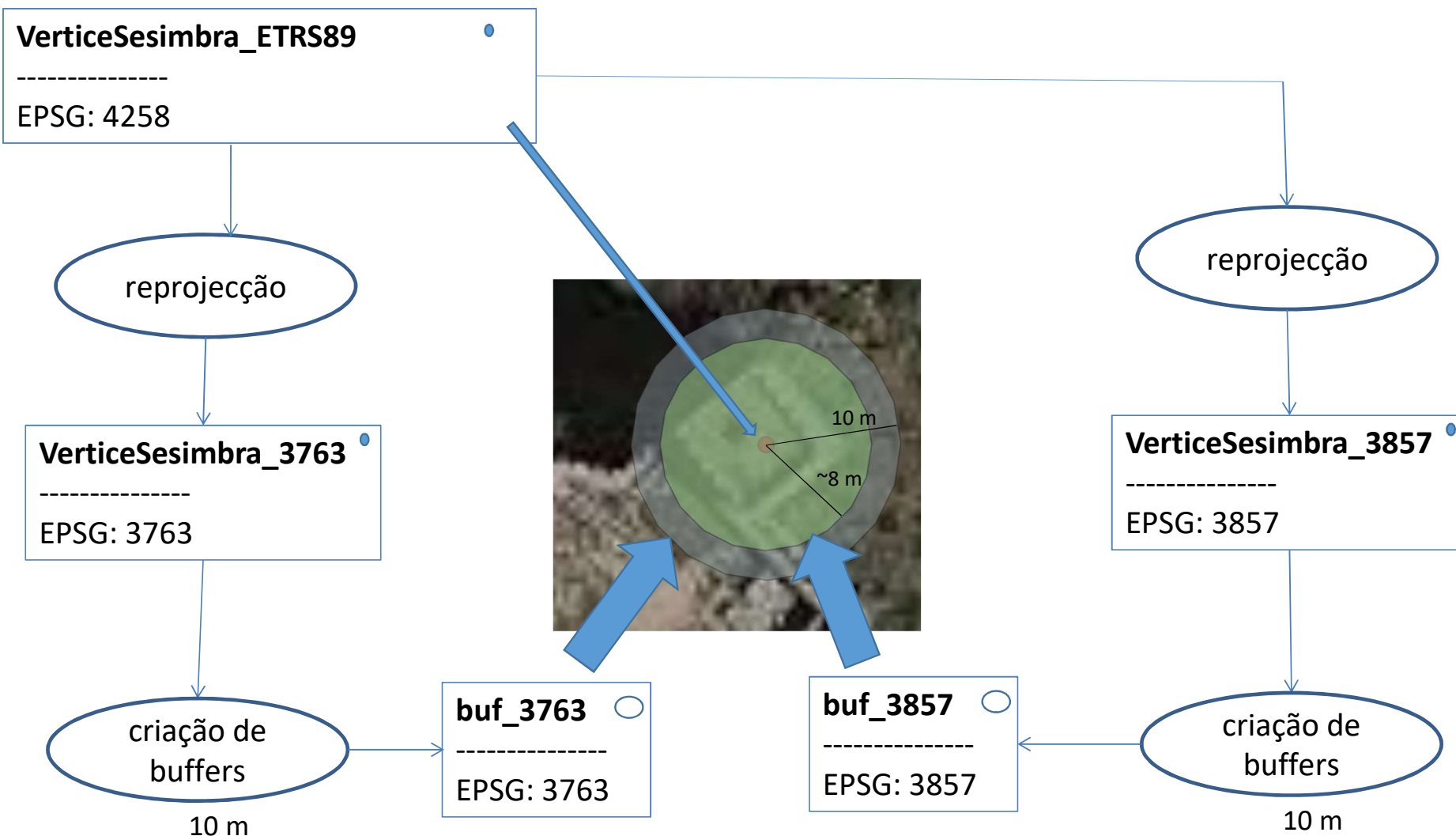


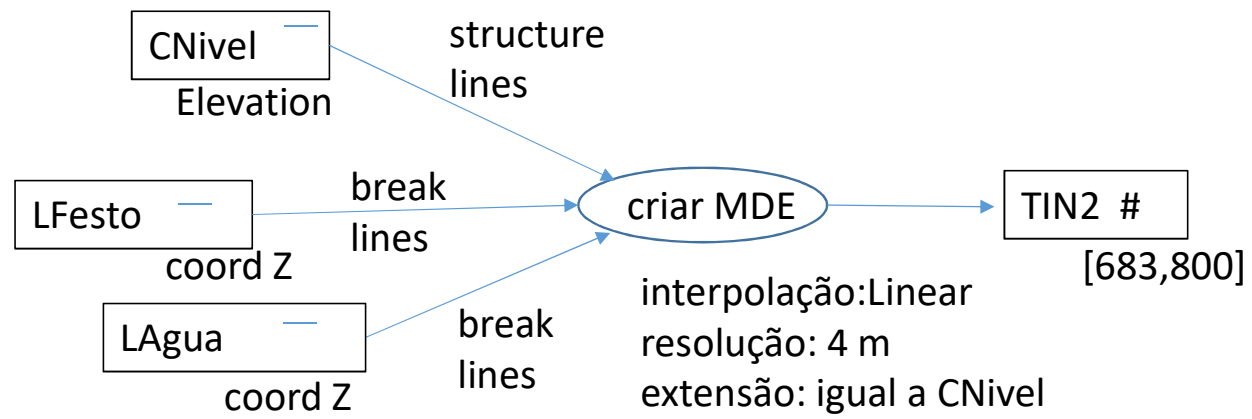






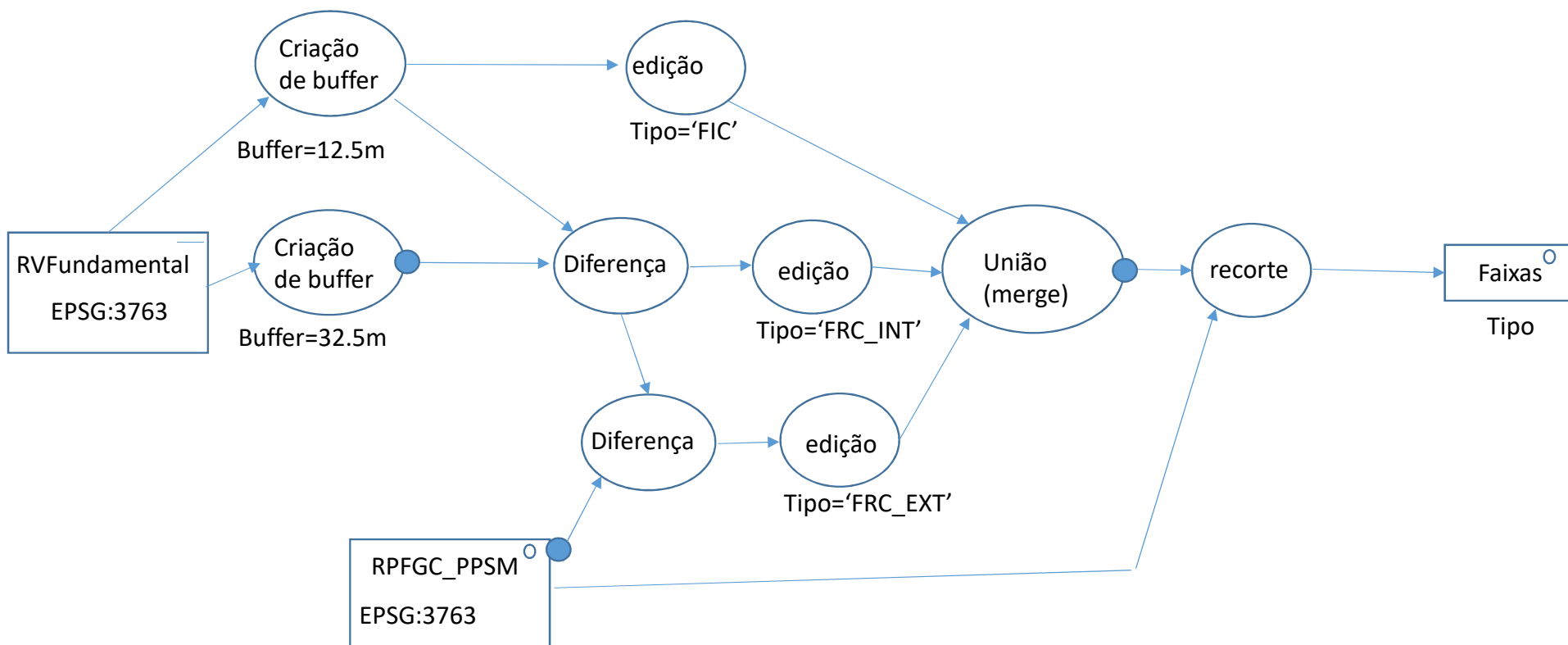


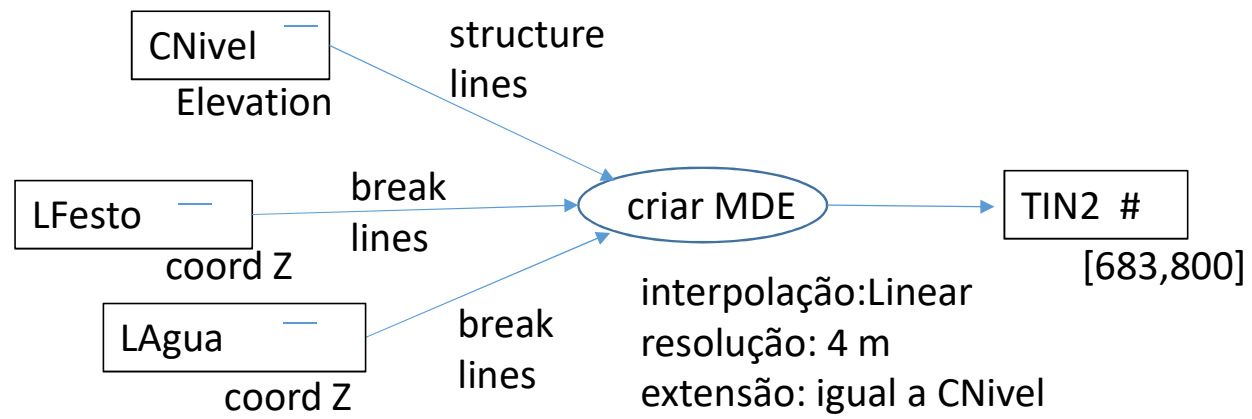




Trabalho avaliação 2020-2021

Parte 2: 5)



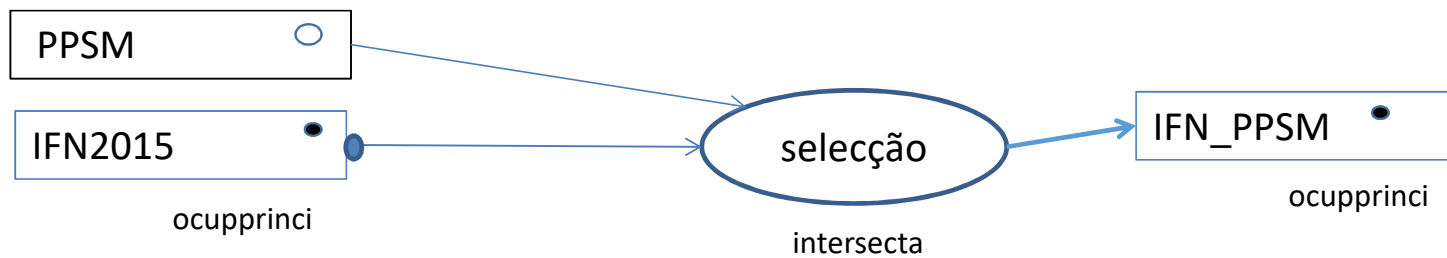
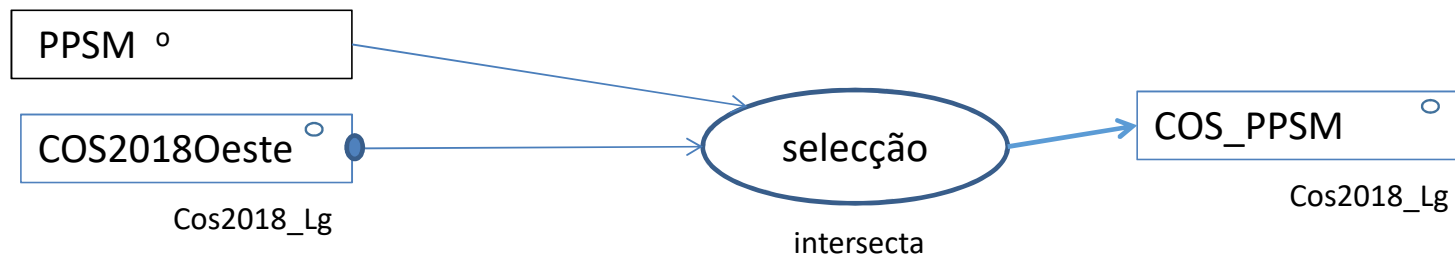
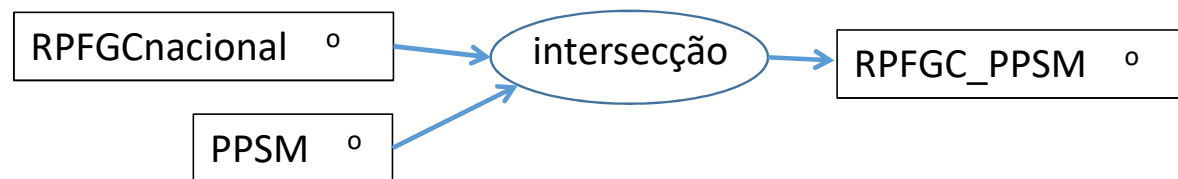
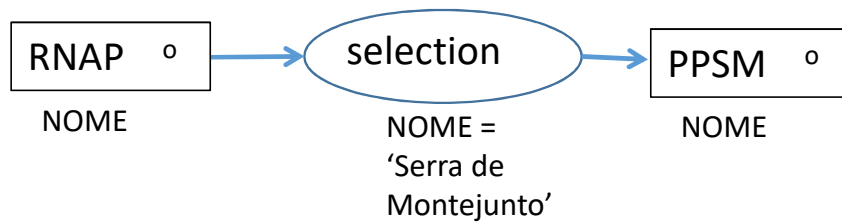


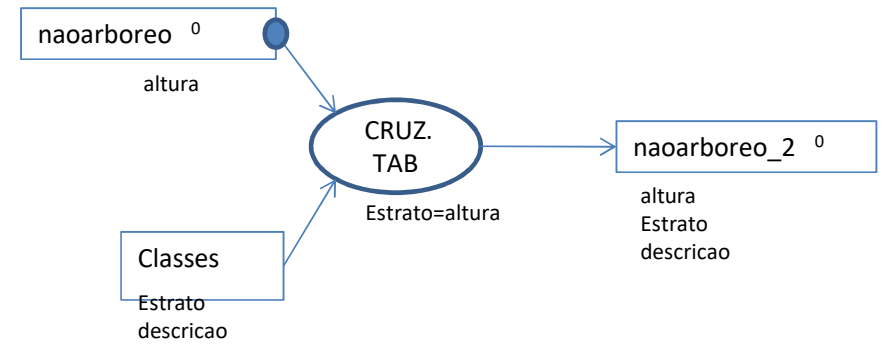
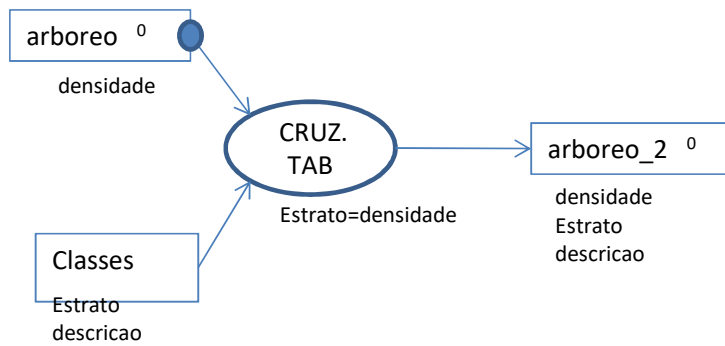
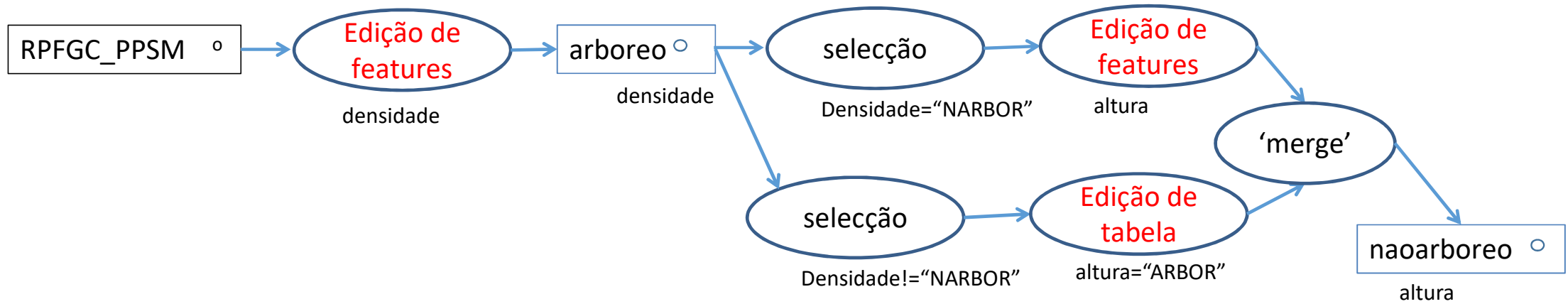
RNAP °

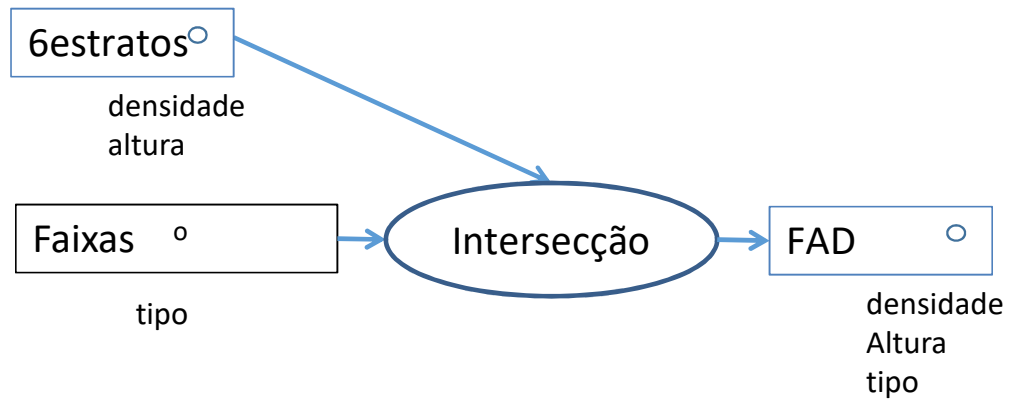
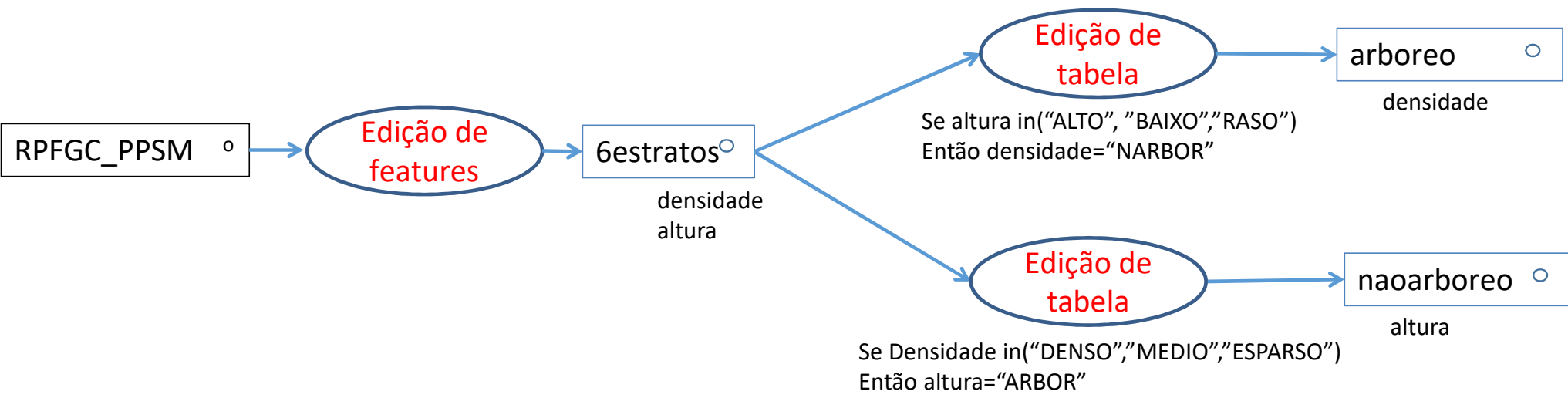
RPFGCnacional °

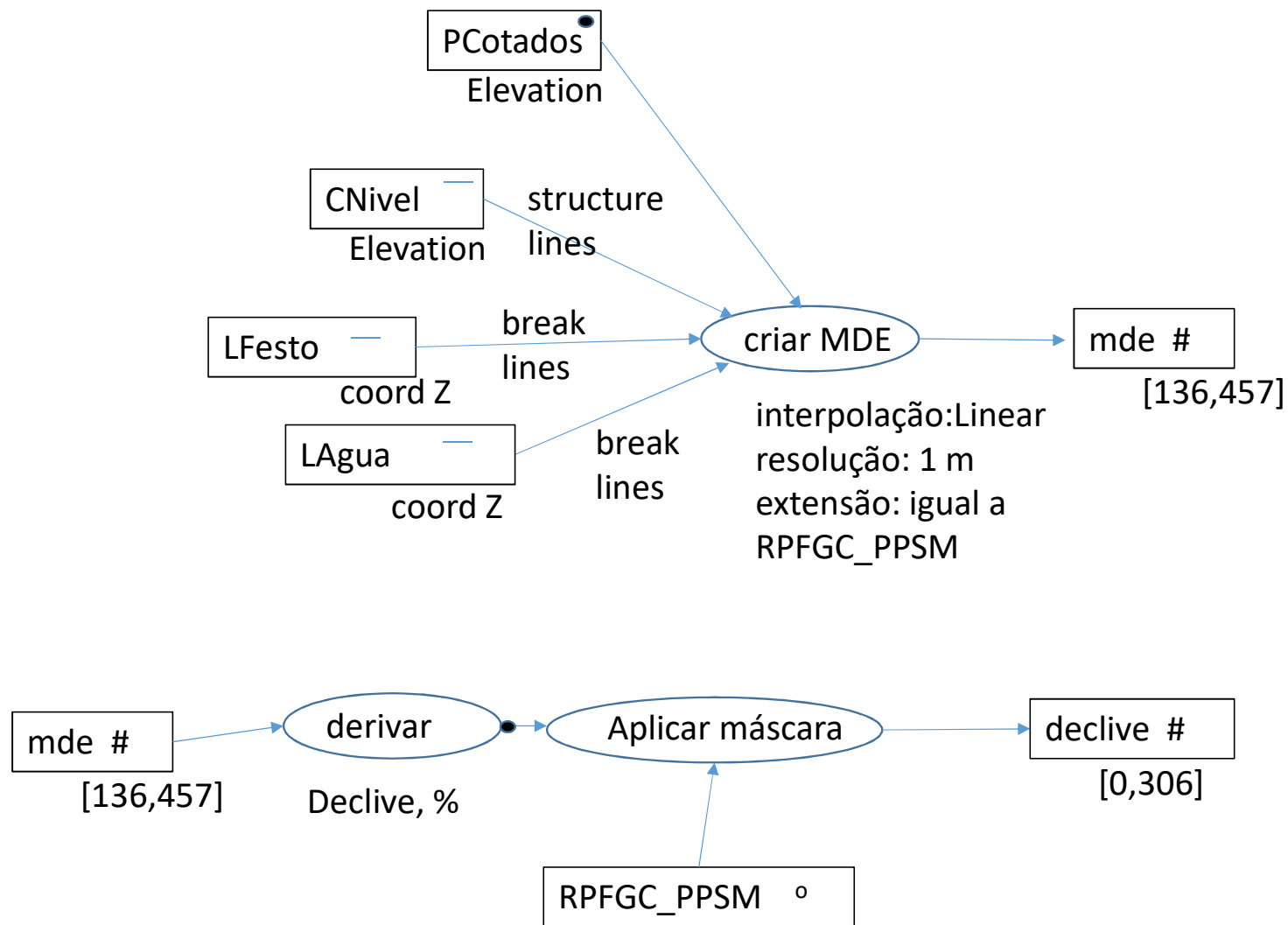
COS2018Oeste °

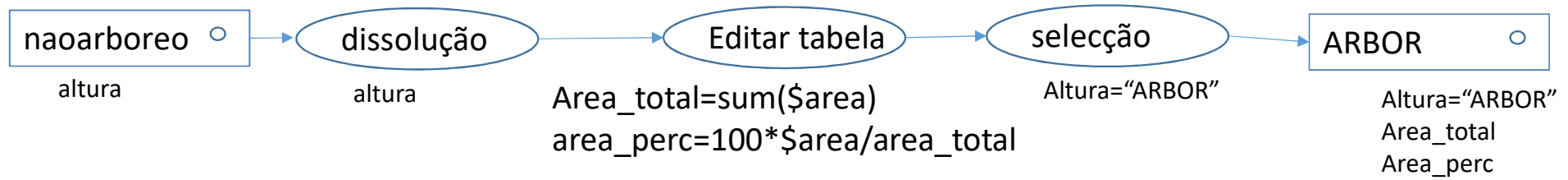
IFN2015 °

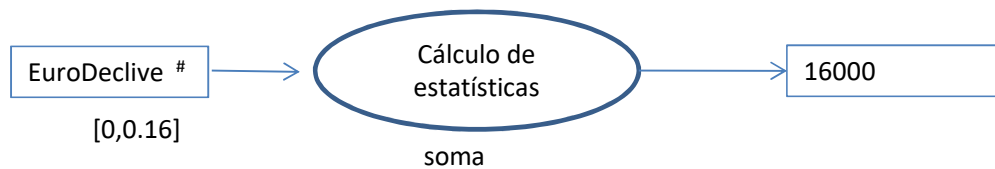
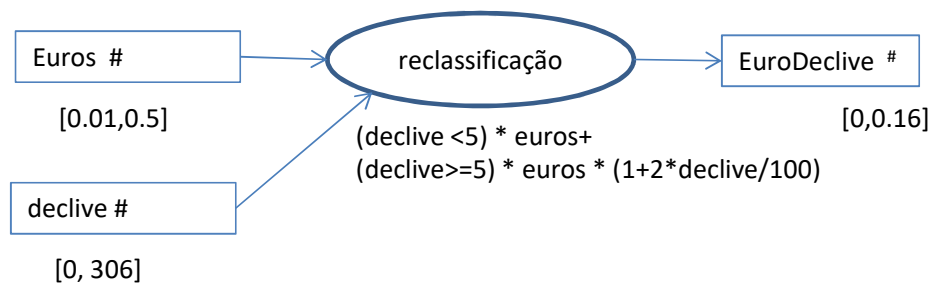
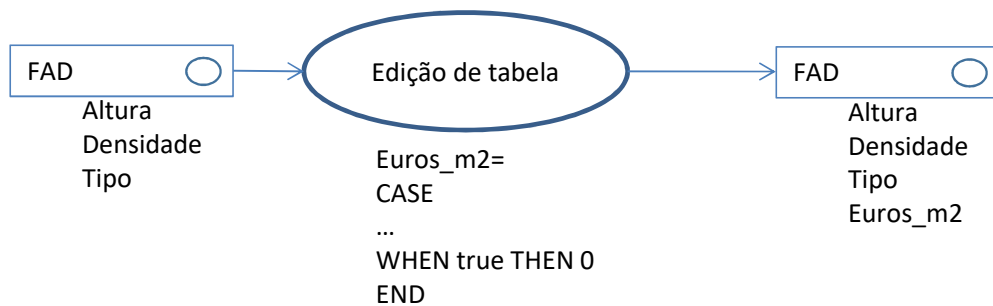


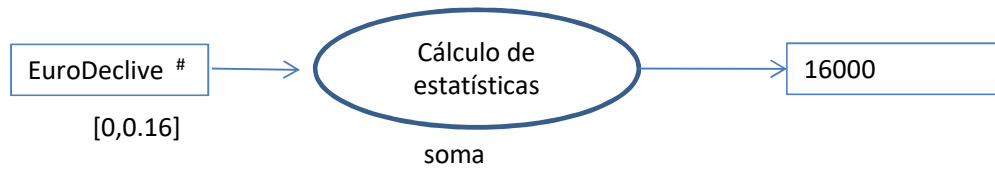
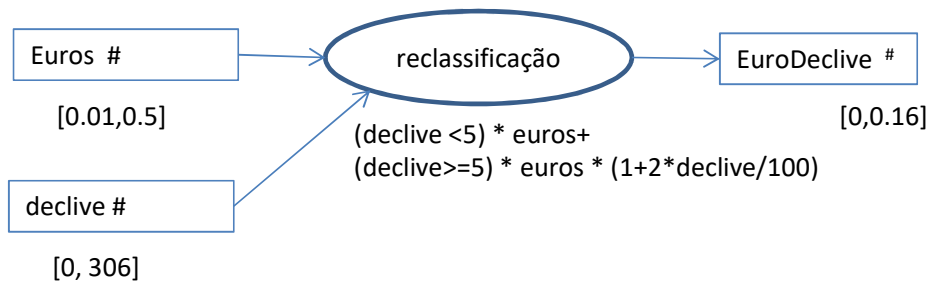
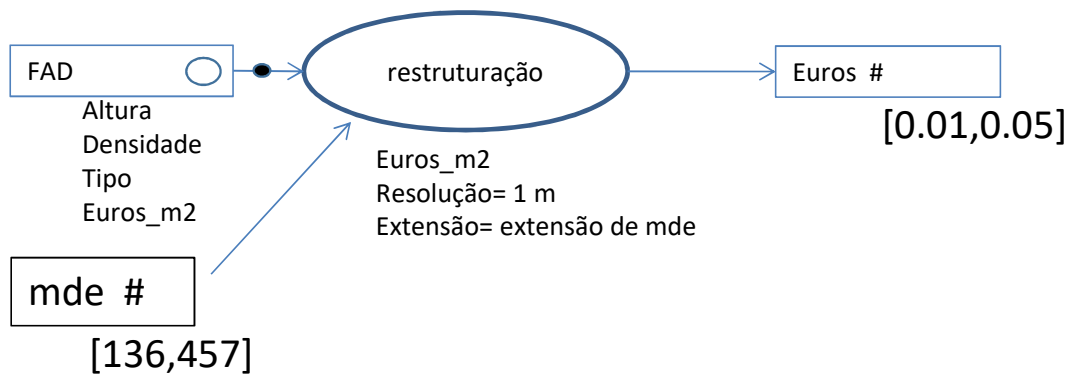


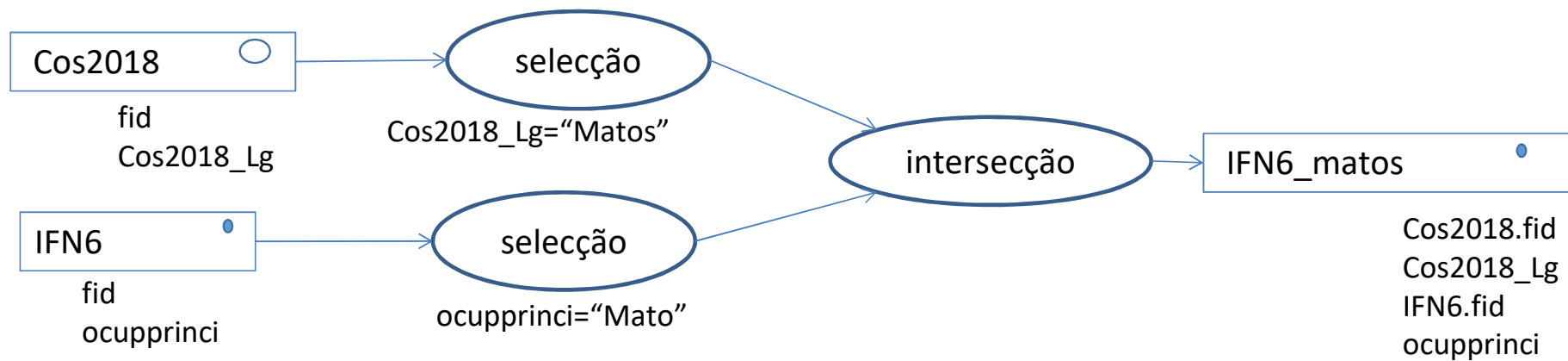
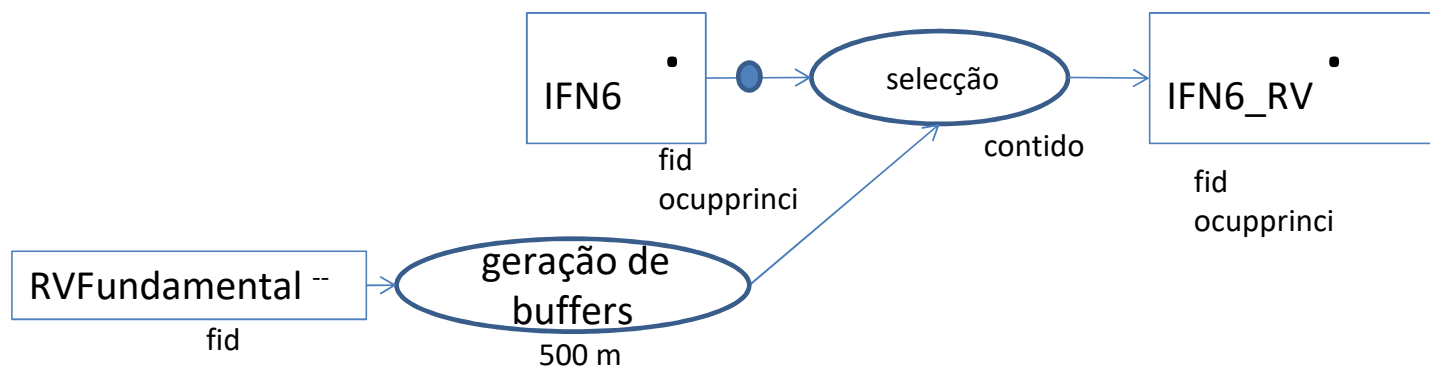


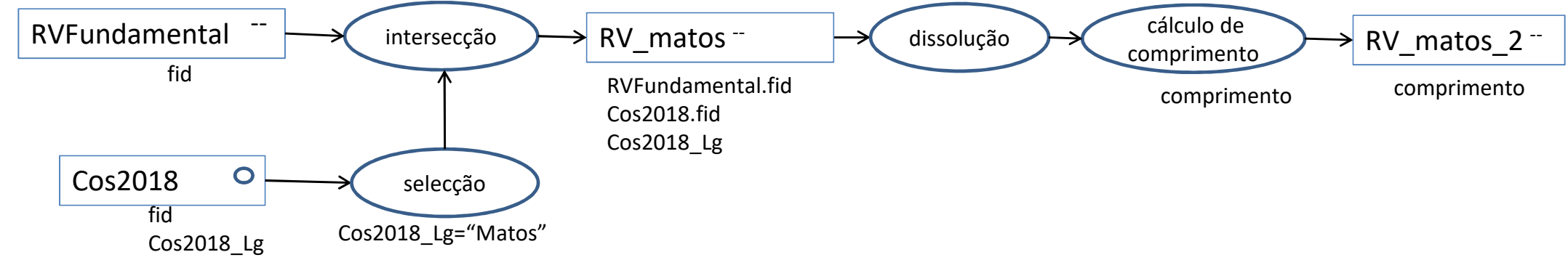
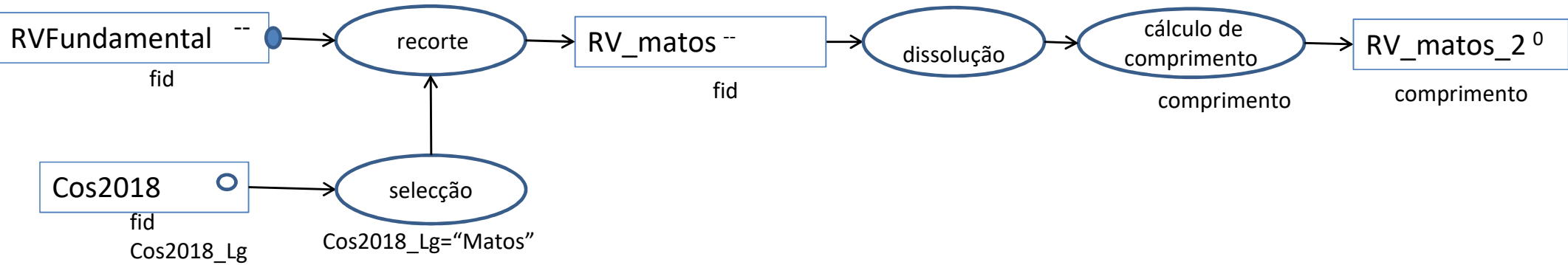


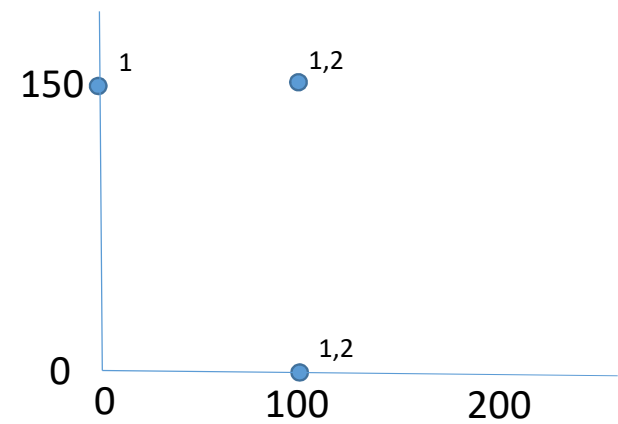
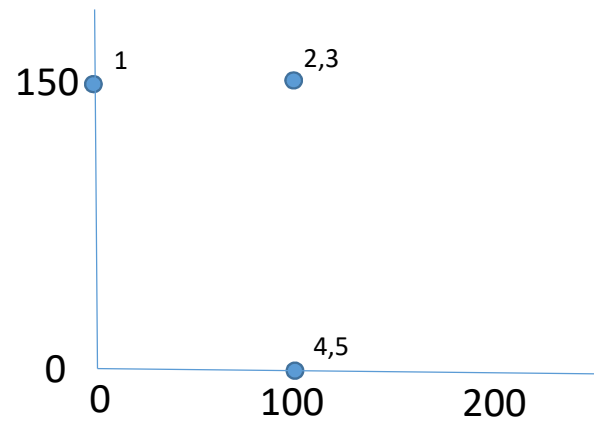
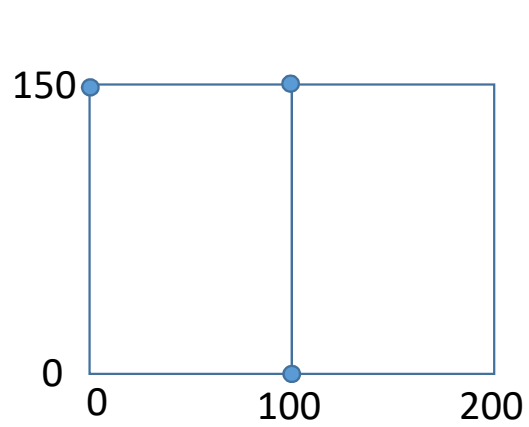
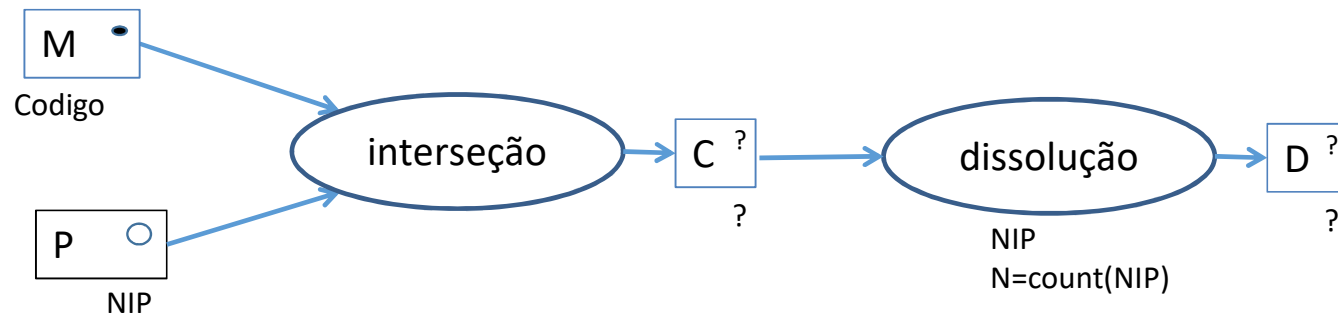


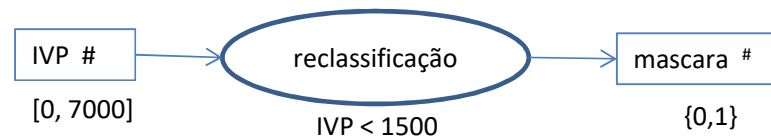
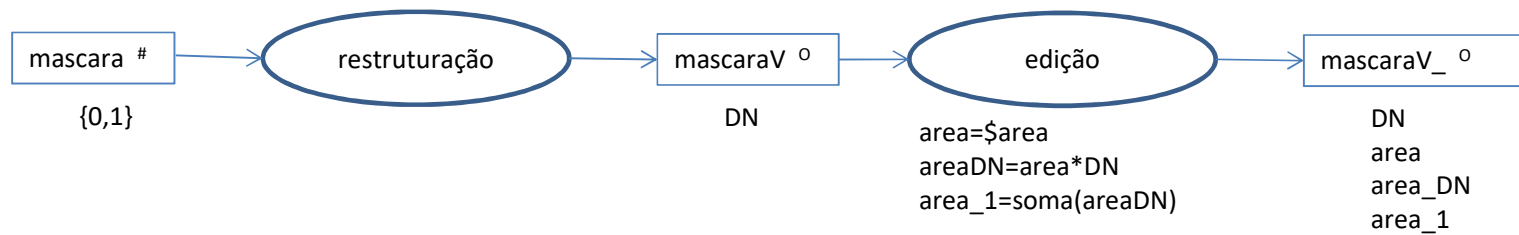


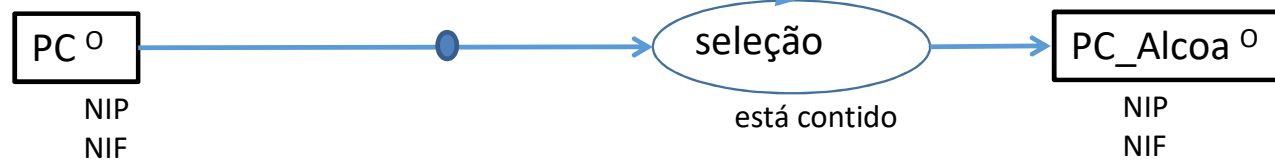
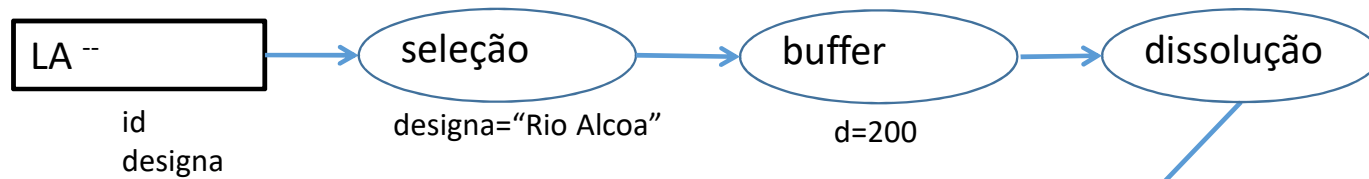
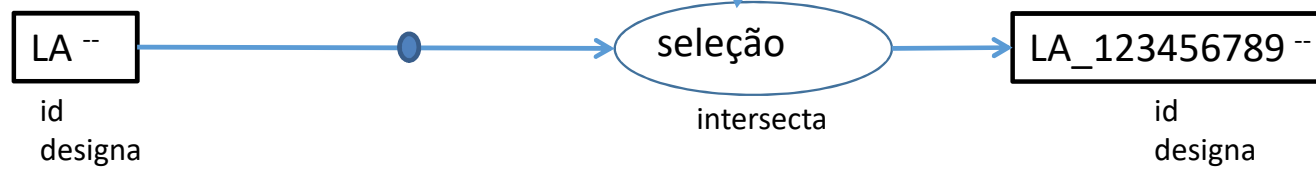
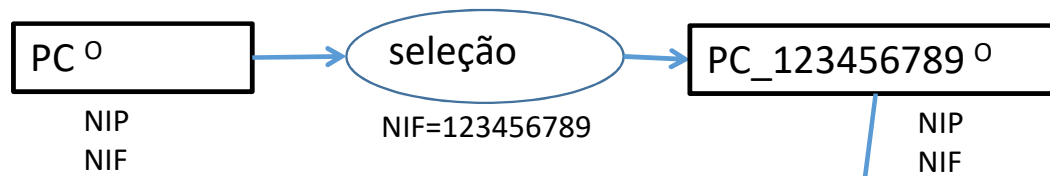


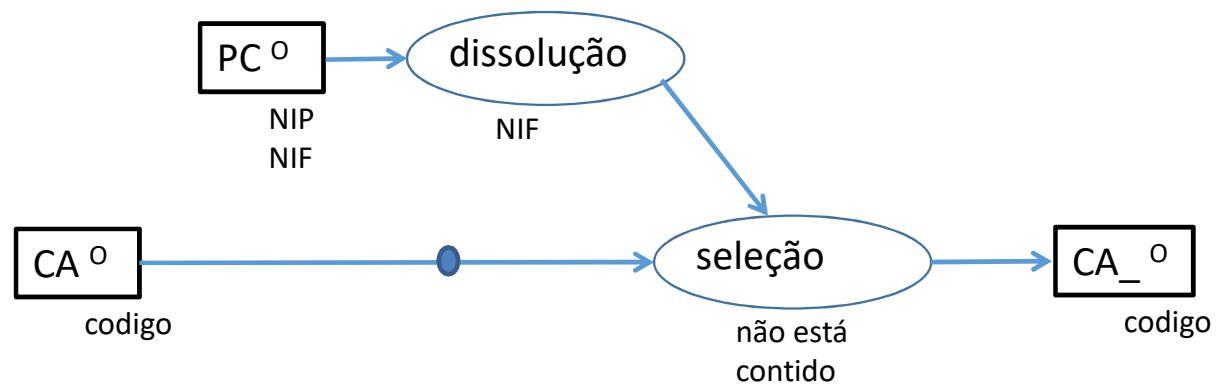












2a chamada 22 junho 2023

