



SERVEI DE SISTEMES  
D'INFORMACIÓ GEOGRÀFICA  
I TELEDETECCIÓ  
Universitat de Girona

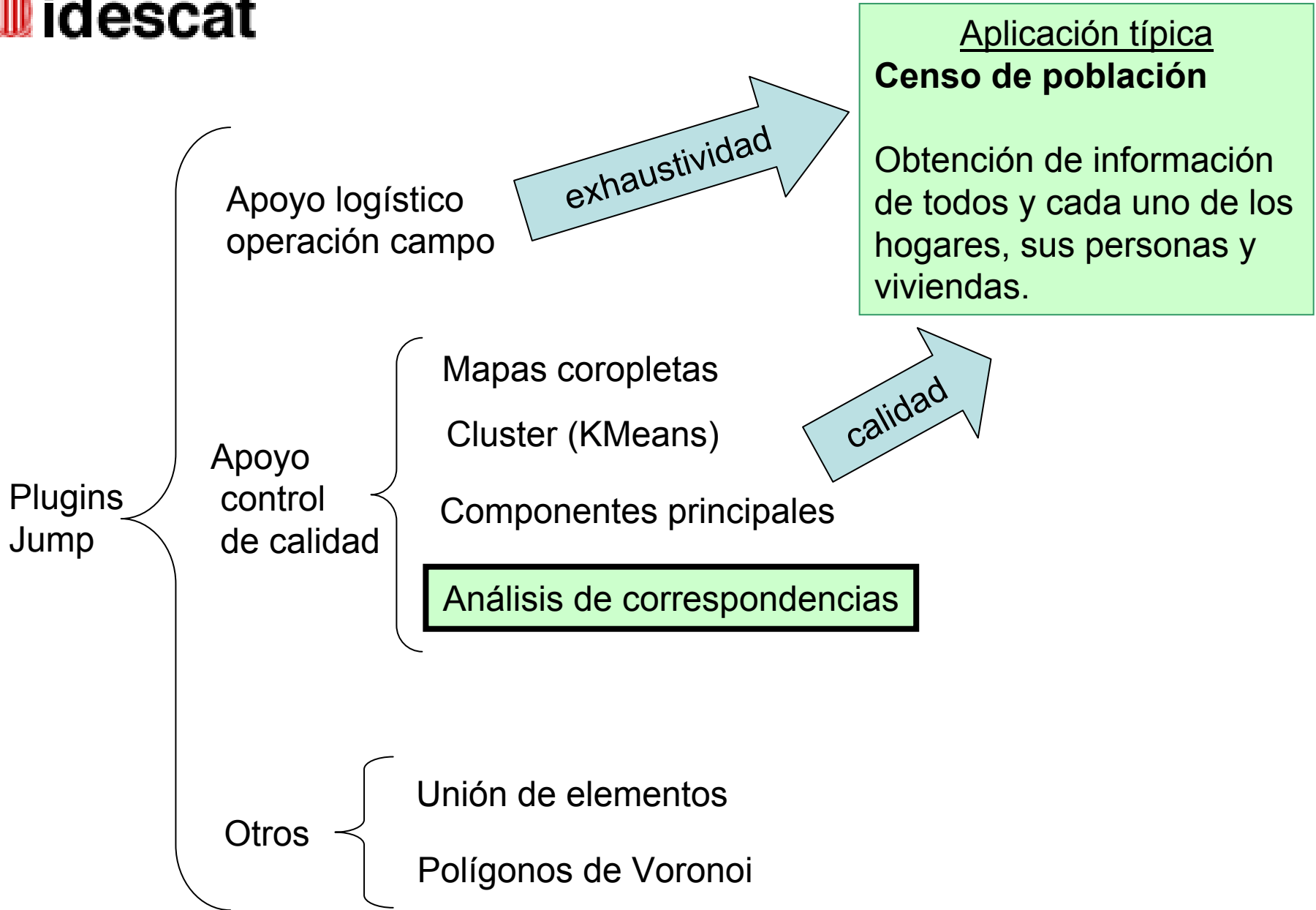


## I JORNADAS DE SIG LIBRE

Algunos desarrollos basados en Jump  
para el apoyo logístico y control de la  
calidad en las operaciones de recogida  
de información estadística

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[www.idescat.net](http://www.idescat.net)

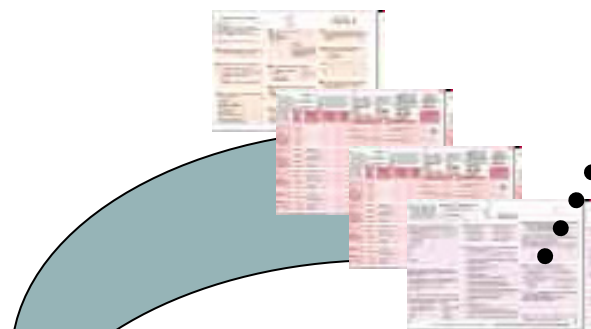


## 8 ¿Cuál es la actividad principal del establecimiento o local donde trabajaba?

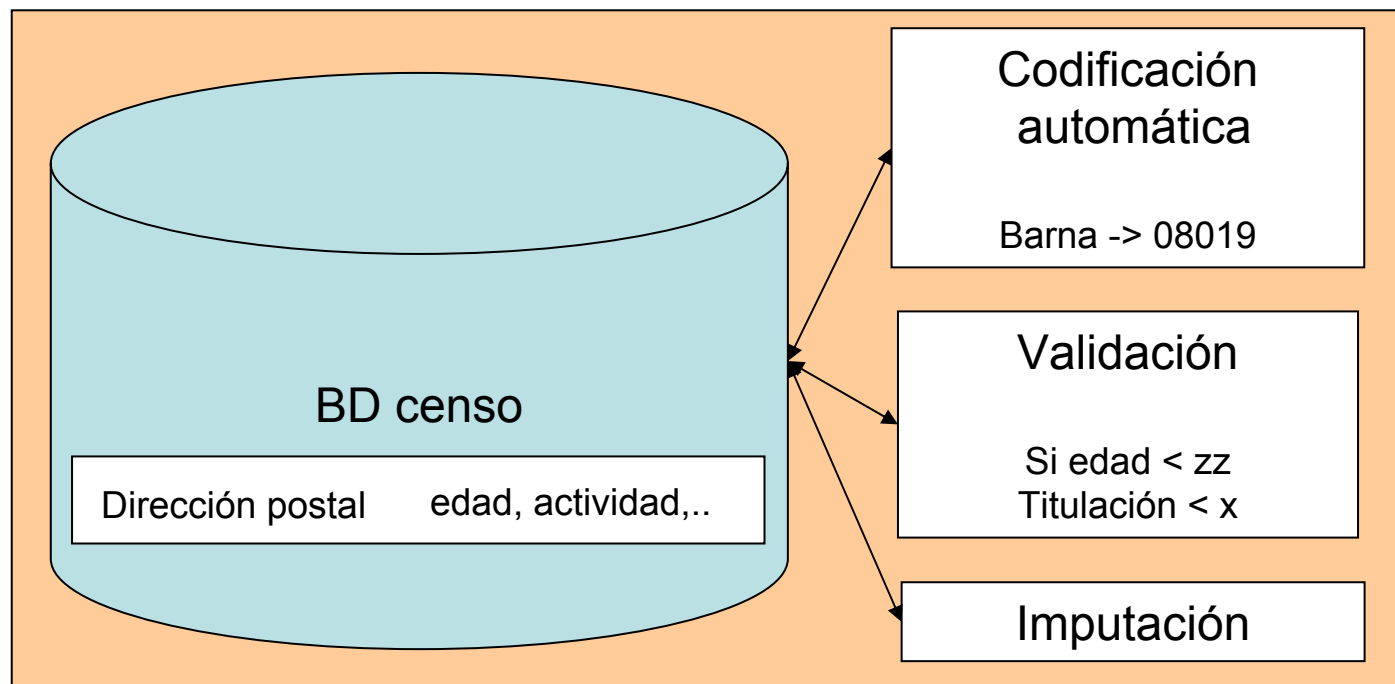
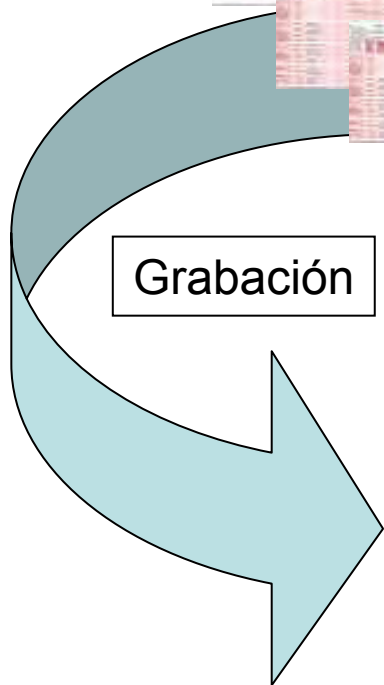
Búsquela en la TABLA DE ACTIVIDADES (en la hoja blanca, la de título rojo) y anote el número que la recoge:

Si no ha encontrado la actividad o tiene dudas, escribala a continuación:

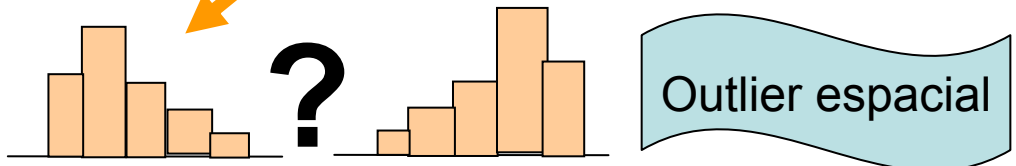
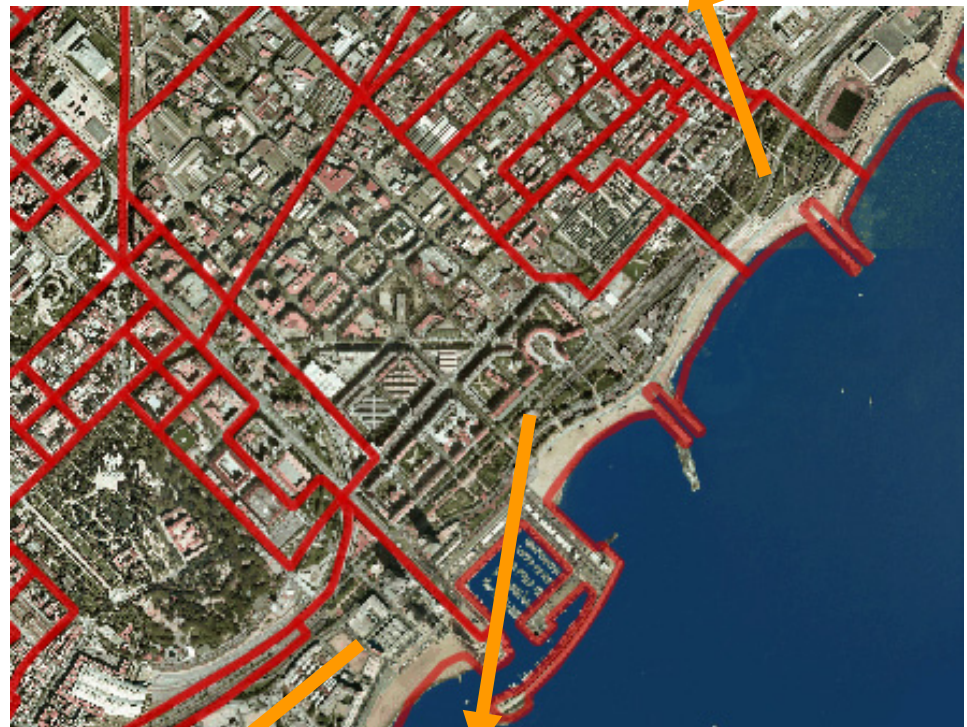
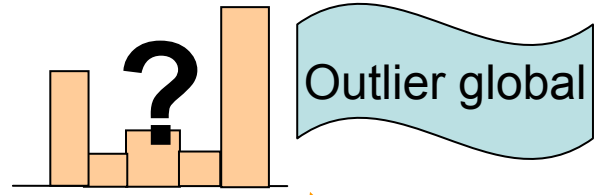
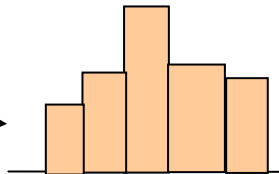
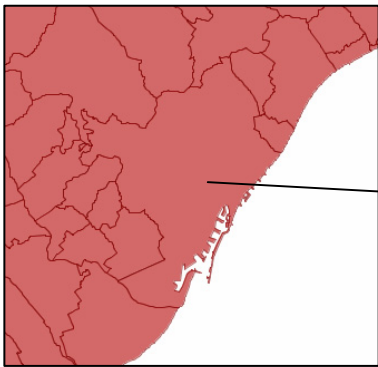
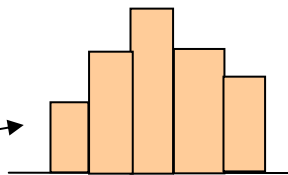
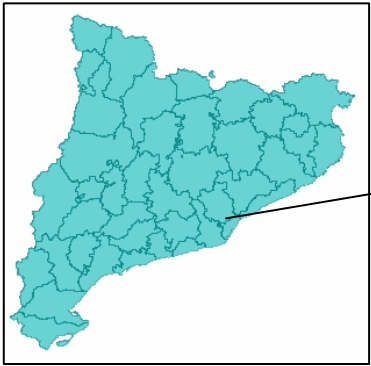
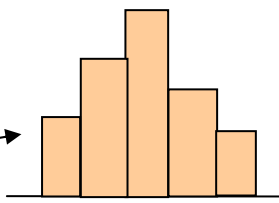
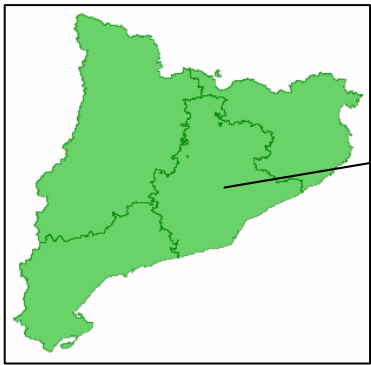
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



Grabación



```
SELECT COUNT(*),ACTIV, COD_GEO FROM BD GROUP BY ACTIV, COD_GEO
```



En el Barcelonés  
1996 secciones censales  
215 códigos de actividad

Necesitamos reducir la dimensionalidad del problema

Análisis de correspondencias

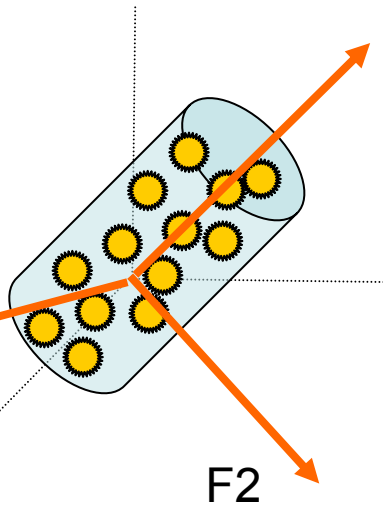
Similar a un componentes principales  
con la métrica

$$d^2(i, i') = \sum_{j=1}^J \left\{ \frac{f_{ij}}{f_i \sqrt{f_{.j}}} - \frac{f_{i'j}}{f_{i'} \sqrt{f_{.j}}} \right\}^2$$

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	seccio censal	011	012	013	014	015	020	050	101	111	112	132	141	142
2	0801501003	1	0	0	0	0	0	0	0	0	0	0	0	0
3	0801502009	1	0	0	0	0	0	0	0	0	0	0	0	0
4	0801502010	1	0	0	0	0	0	0	0	0	0	0	0	0
5	0801502013	1	0	0	0	0	0	0	0	0	0	0	0	0
6	0801502015	1	0	0	2	0	0	0	0	0	0	0	0	0
7	0801503003	1	0	0	2	0	0	0	0	0	0	0	0	0
8	0801503007	1	0	0	0	0	0	0	0	0	0	0	0	0
9	0801503008	1	0	0	0	0	0	0	0	0	0	0	0	0
10	0801503012	1	0	0	0	0	0	0	0	0	0	0	0	0
11	0801504001	2	0	0	0	0	0	0	0	0	0	0	1	0
12	0801504002	1	0	0	0	0	0	0	0	0	0	0	0	0
13	0801504003	1	1	0	0	0	0	0	0	0	0	0	0	0
14	0801504004	1	0	0	1	0	0	0	0	0	0	0	0	0
15	0801504005	2	0	0	0	0	0	0	0	0	0	0	0	0
16	0801504006	2	0	0	0	0	0	0	0	0	0	0	0	0
17	0801505001	2	0	0	0	0	0	0	0	0	0	0	0	0
18	0801505003	1	0	0	0	0	0	0	0	0	0	0	0	0
19	0801505005	1	0	0	0	0	0	0	0	0	0	0	0	0
20	0801506002	4	0	0	0	0	0	0	0	0	0	0	1	0
21	0801506003	2	0	0	0	1	0	1	1	0	0	0	0	0
22	0801507002	3	0	0	0	0	0	0	0	0	0	0	0	0
23	0801507003	1	0	0	0	0	0	0	0	0	0	0	0	0
24	0801507010	2	0	0	0	0	0	0	0	0	0	0	0	0
25	0801507014	1	0	0	0	0	0	0	0	0	0	0	0	0
26	0801507015	1	0	0	0	0	0	0	0	0	0	0	0	0
27	0801507018	1	0	0	0	0	0	0	0	0	0	0	0	0
28	0801507023	1	0	0	0	0	0	0	0	0	0	0	0	0
29	0801507024	1	0	0	0	0	0	0	0	0	0	0	0	0
30	0801507027	1	0	0	0	0	0	0	1	0	0	0	0	0

# Interpretación

Obtener nuevos ejes ortogonales de forma que la descomposición de la inercia sea



$$I_{F1} \geq I_{F2} \geq I_{F3} \geq 0$$

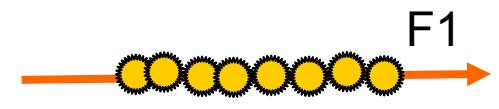
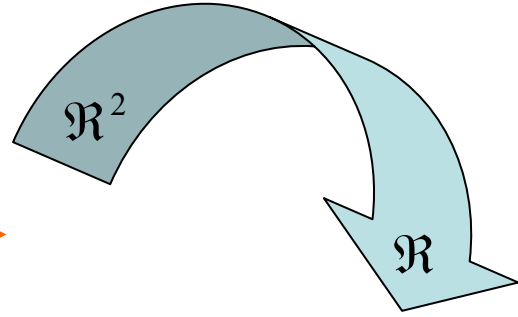
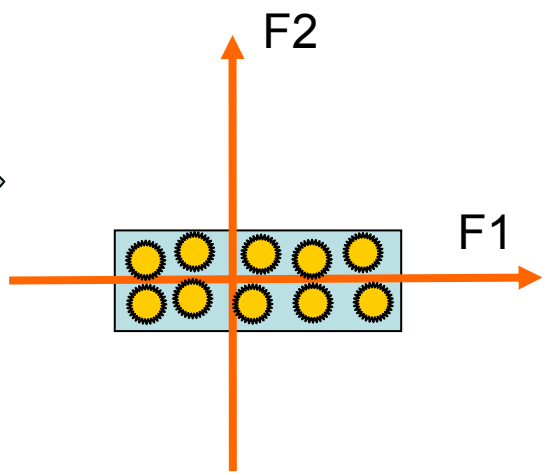
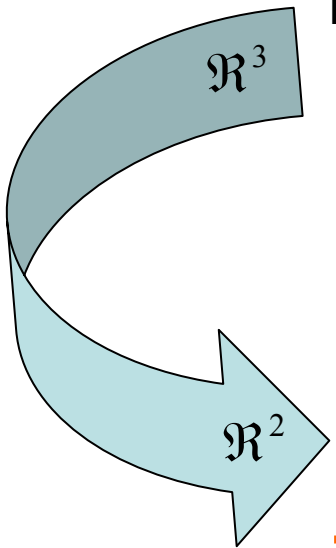
$$I_t = I_{F1} + I_{F2} + I_{F3}$$

diagonalizar

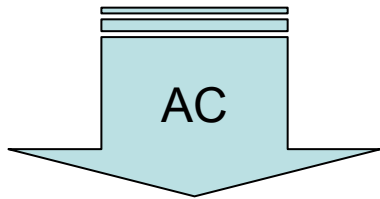
$$T = X^t X$$

$$x(i, j) = \frac{(f_{ij} - f_i \cdot f_j)}{\sqrt{f_i \cdot f_j}}$$

$$\lambda_1 \geq \lambda_2 \geq \lambda_3 \geq 0$$



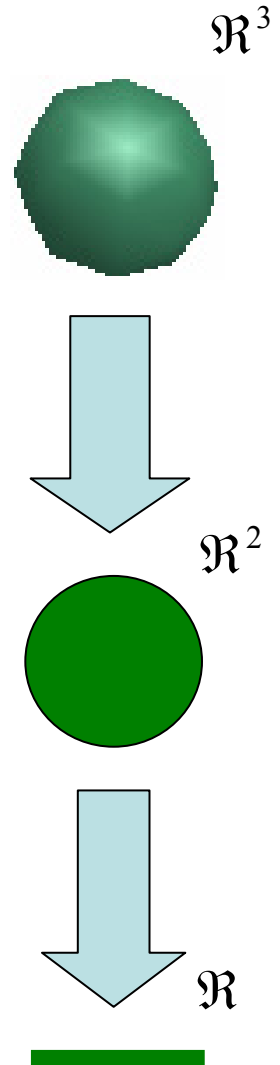
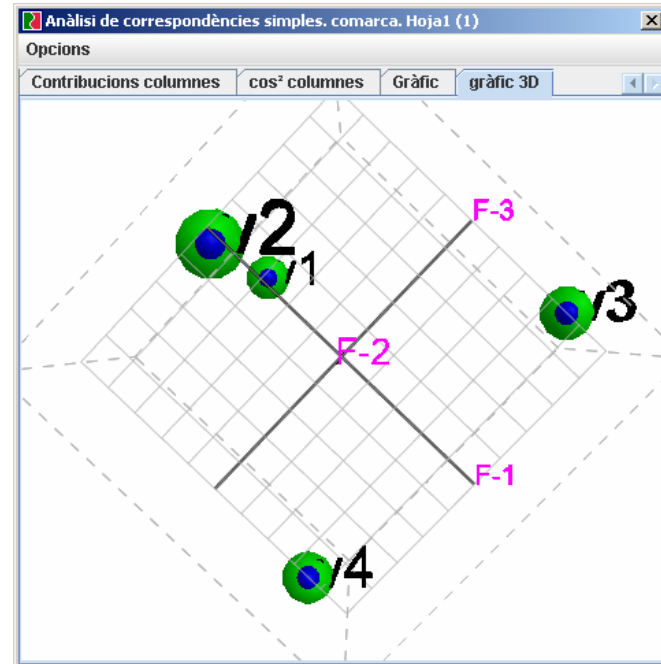
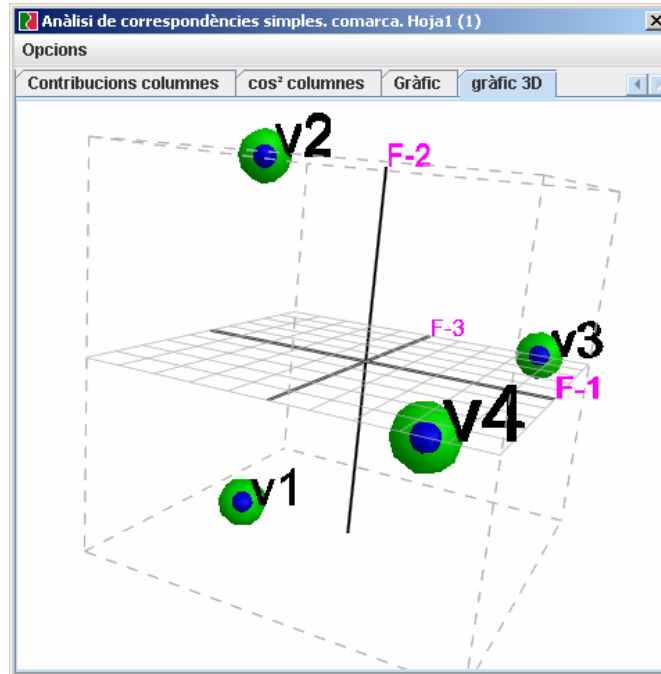
com	var-1	var-2	var-3	var-4
01	3	2	2	2
02	2	3	2	2
03	2	2	3	2
04	2	2	2	3



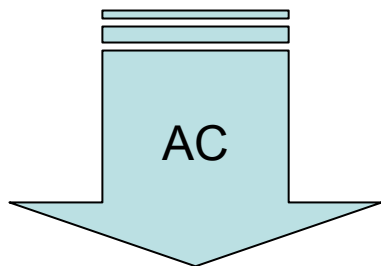
$$\chi^2 = 1.3$$

$$N = 36$$

Factor	Valor propio	% Inercia explicada	% acum.
1	0.0123	33.33	33.33
2	0.0123	33.33	66.66
3	0.0123	33.33	100



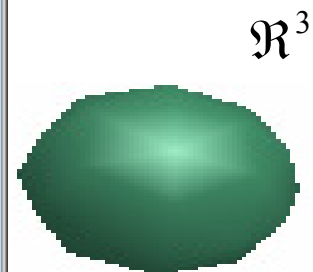
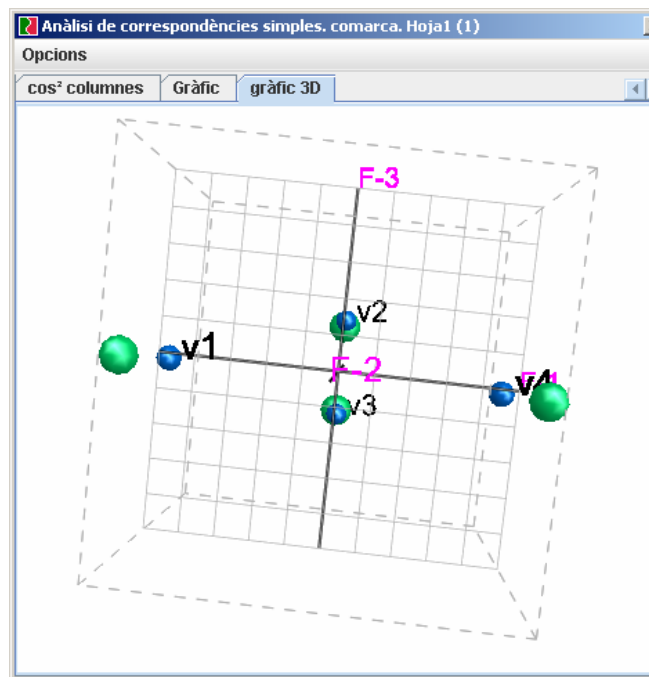
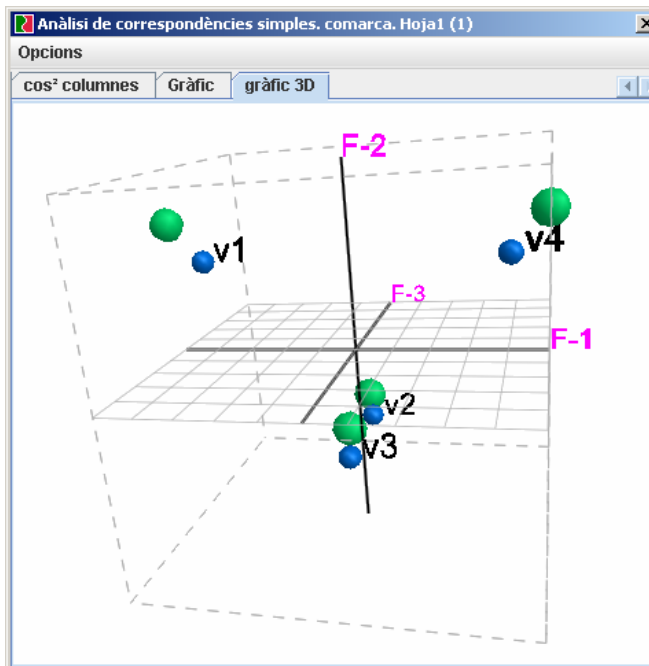
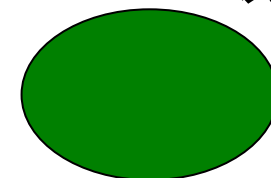
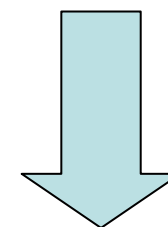
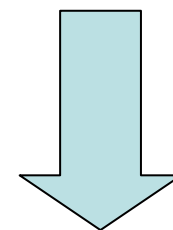
com	var-1	var-2	var-3	var-4
01	4	0	0	0
02	1	4	2	1
03	1	2	4	1
04	0	0	0	4



$$\chi^2 = 30$$

$$N = 24$$

Factor	Valor propi	% Inercia explicada	% acum.
1	0.667	53.33	53.33
2	0.500	40.00	93.33
3	0.083	6.66	100


 $\mathbb{R}^3$ 

 $\mathbb{R}^2$ 

 $\mathbb{R}$ 

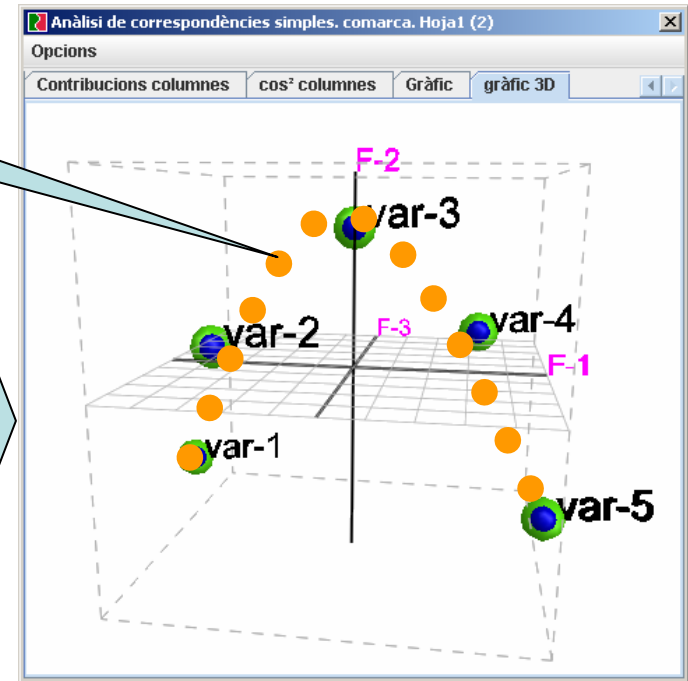



## Efecto Guttman

Una tabla casi diagonal

com	var-1	var-2	var-3	var-4	var-5
01	5	2	0	0	0
02	2	5	2	0	0
03	0	2	5	2	0
04	0	0	2	5	2
05	0	0	0	2	5

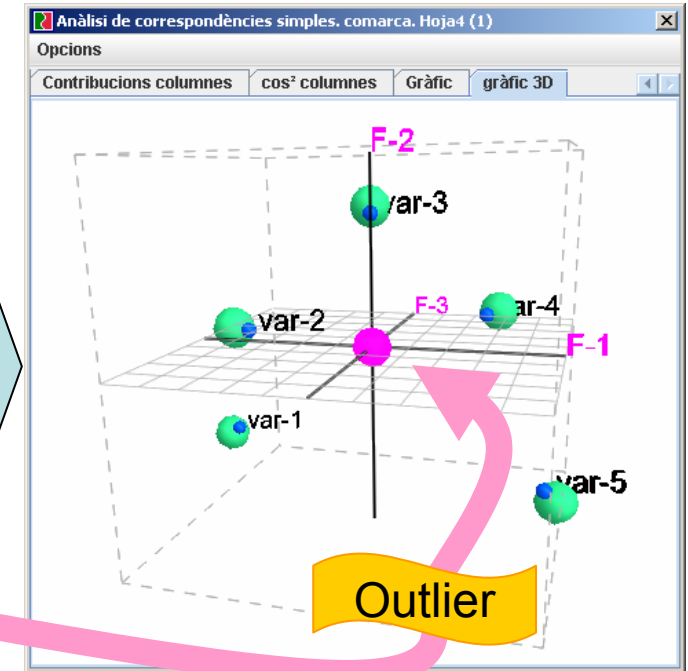
AC



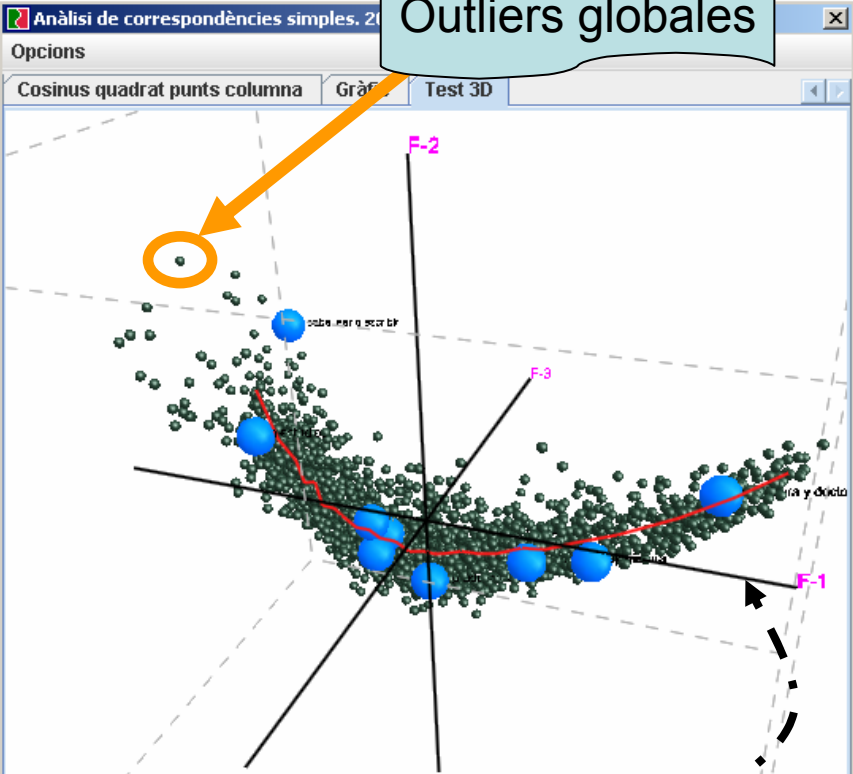
Anterior más un outlier

com	var-1	var-2	var-3	var-4	var-5
01	5	2	0	0	0
02	2	5	2	0	0
03	0	2	5	2	0
04	0	0	2	5	2
05	0	0	0	2	5
06	1	2	1	2	1

AC

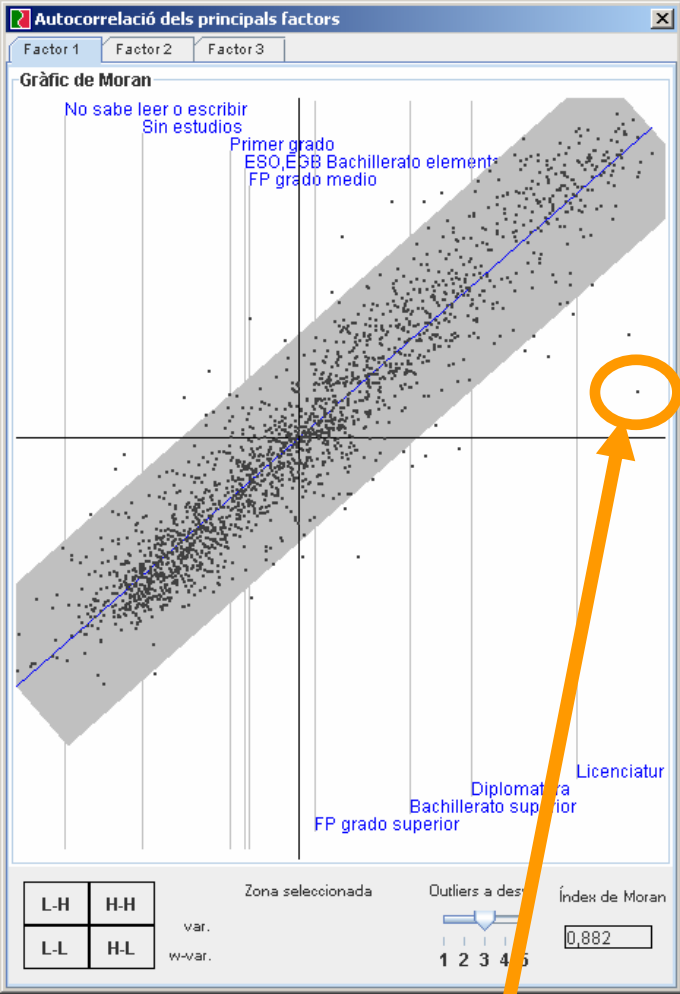


Outliers globales

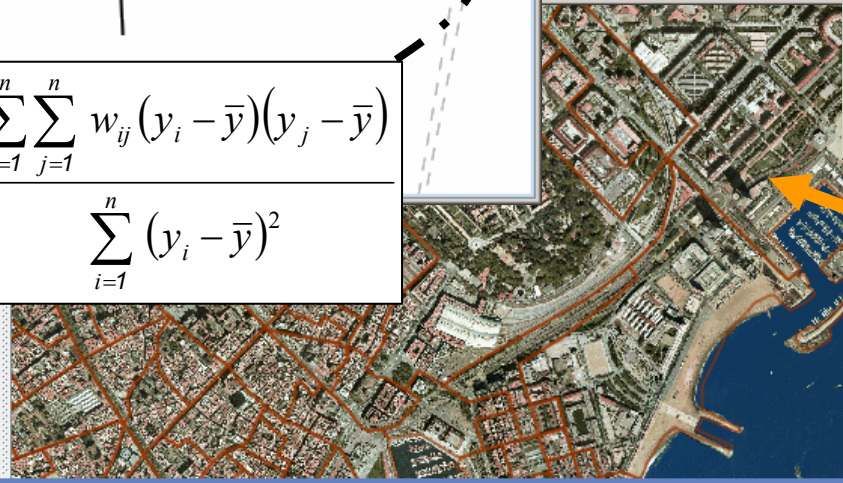


Microsoft Excel - SEC\_CP01\_TITULACIO\_RECOM

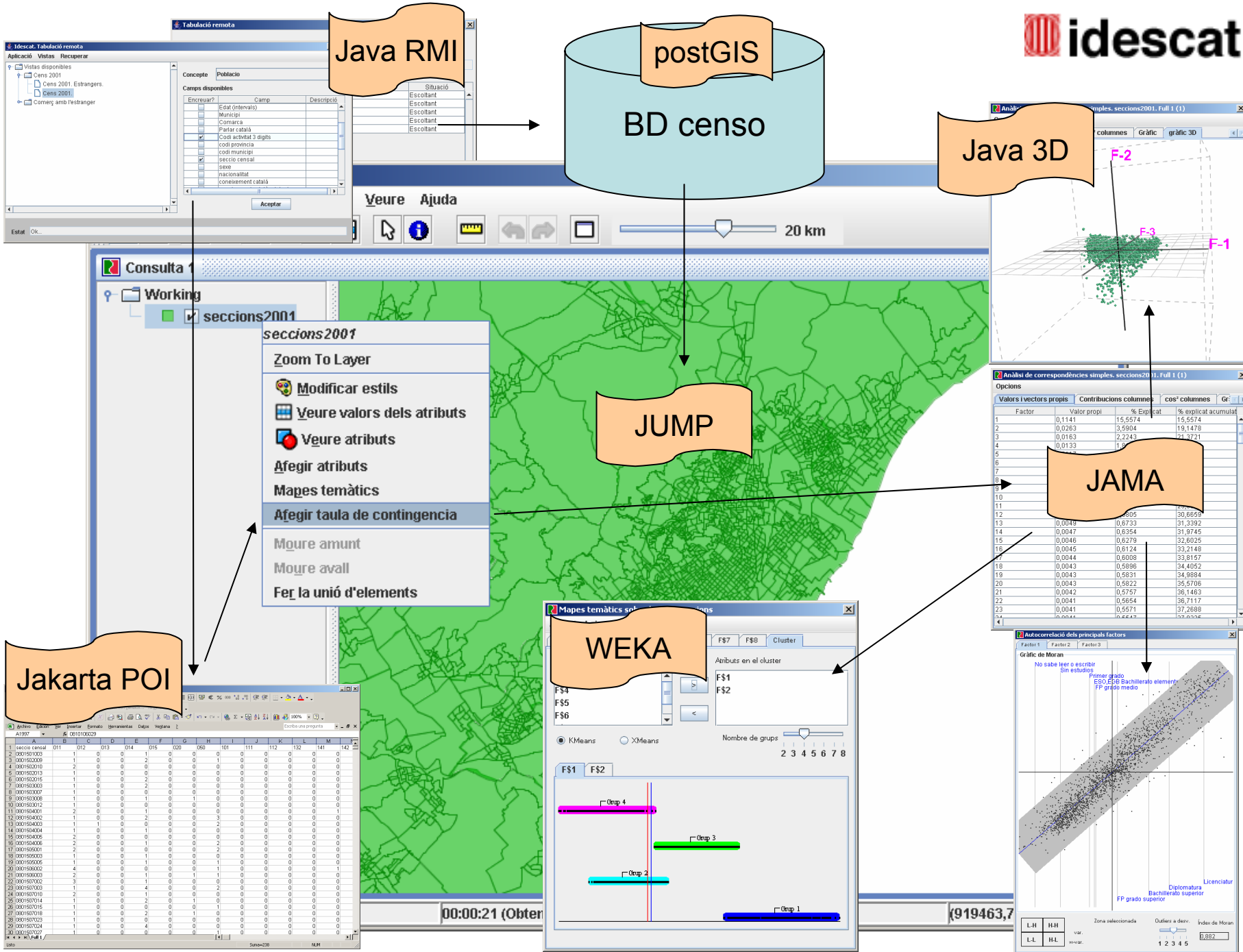
	B	C	Pri
001	12	67	
002	10	88	
003	7	99	
004	4	45	
005	9	134	
007	9	86	
008	7	41	
001	20	162	
002	18	90	
003	12	62	
004	16	135	
005	36	143	
006	29	113	
007	27	104	
008	24	233	
009	95	172	
010	59	233	
011	39	207	
012	37	201	
013	36	189	
014	15	106	
015	46	208	
001	20	116	
002	28	228	



$$I = \frac{n}{\sum_{i=1}^n \sum_{j=1}^n w_{ij}} \frac{\sum_{i=1}^n \sum_{j=1}^n w_{ij} (y_i - \bar{y})(y_j - \bar{y})}{\sum_{i=1}^n (y_i - \bar{y})^2}$$



Outliers espaciales



Java RMI

postGIS

BD censo

Java 3D

JUMP

JAMA

Mapes temàtics sol...

WEKA

F\$7 F\$8 Cluster

Atributs en el clúster

F\$1 F\$2

Nombre de grups

2 3 4 5 6 7 8

Clup. 4

Clup. 3

Clup. 2

Clup. 1

Jakarta POI

Consulta

Working

seccions2001

seccions2001

Zoom To Layer

Modificar estils

Veure valors dels atributs

Veure atributs

Afegir atributs

Mapes temàtics

Afegir taula de contingència

Moure amunt

Moure avall

Fe'r la unió d'elements

00:00:21 (Obter...

(919463,7

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0

Anàlisi de correspondències simples, seccions2001, Full 1 (1)

Opcions

Valors i vectors propis	Contribucions columnes	cos' columnes	Gr
Factor	Valor propi	% Explicat	% explicat acumulat
1	0,1141	15,5574	15,5574
2	0,0263	3,5904	19,1478
3	0,0163	2,2143	21,3721
4	0,0133	1,7717	
5			
6			
7			
8			
9			
10			
11			
12	0,0049	0,6595	30,6669
13	0,0047	0,6279	31,2942
14	0,0047	0,6354	31,9745
15	0,0046	0,6279	32,6025
16	0,0045	0,6124	33,2148
17	0,0044	0,6008	33,8157
18	0,0043	0,5896	34,4052
19	0,0043	0,5831	34,9884
20	0,0043	0,5822	35,5706
21	0,0042	0,5757	36,1463
22	0,0041	0,5654	36,7117
23	0,0041	0,5571	37,2689
24	0,0041	0,5547	37,8194

Autocorrecció dels principals factors

Gràfic de Moran

No sabe llegir o escriure

Sin estudios

Primer grado

ESO, EGB

Bachillerato elemental

FP grado medio

Diplomatura

Bachillerato superior

FP grado superior

Licenciatur

Zona seleccionada

Outliers a deriv.

Índex de Moran

0,882

## JUMP - Plugins

PlugInCorrespondencias

### <interface>PlugIn

- *public void initialize(PlugInContext context) throws Exception;*
- *public boolean execute(PlugInContext context) throws Exception;*
- *public String getName();*

### PlugInContext

- public Layer getSelectedLayer(int i)*
- public JInternalFrame getActiveInternalFrame()*
- public WorkbenchFrame getWorkbenchFrame()*
- public LayerManager getLayerManager()*

### LayerViewFrame

- public LayerViewPanel getLayerViewPanel()*
- public SelectionManager getSelectionManager()*

### Layer

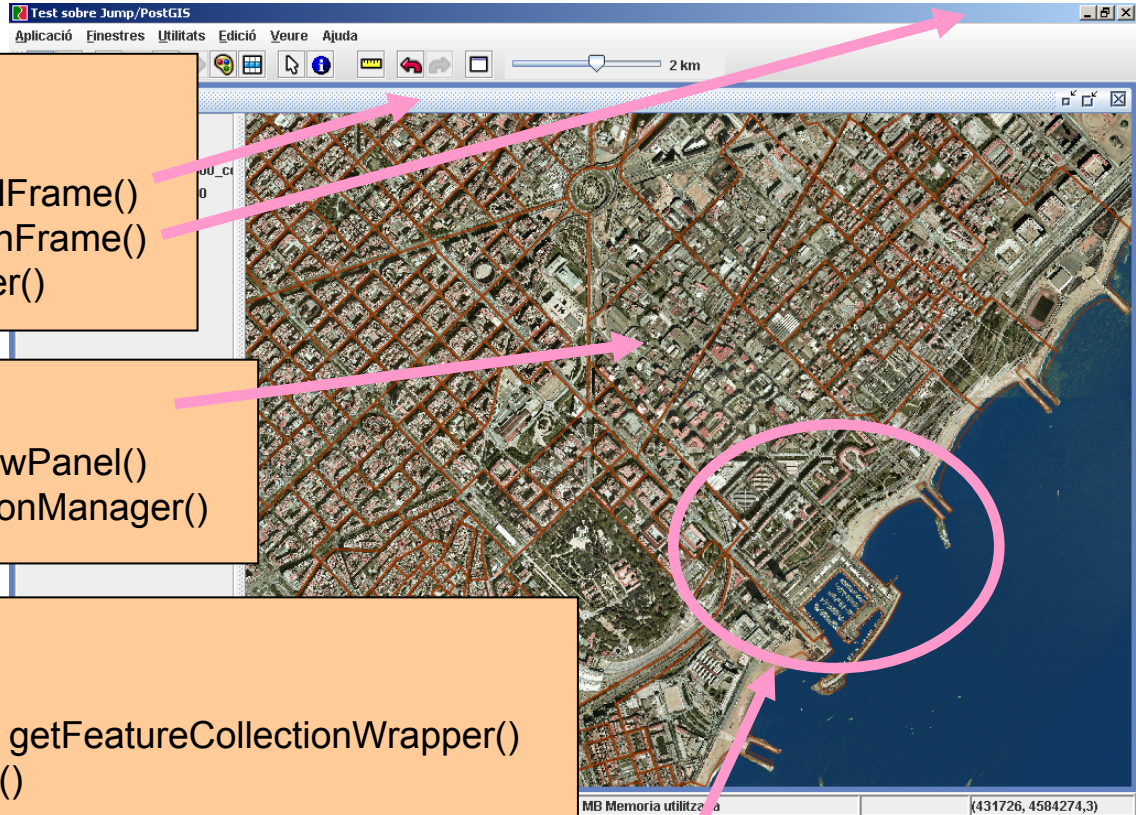
- public void addStyle(Style style)*
- public FeatureCollectionWrapper getFeatureCollectionWrapper()*
- public Blackboard getBlackboard()*

### FeatureCollectionWrapper

- public void add(Feature)*
- public List getFeatures()*

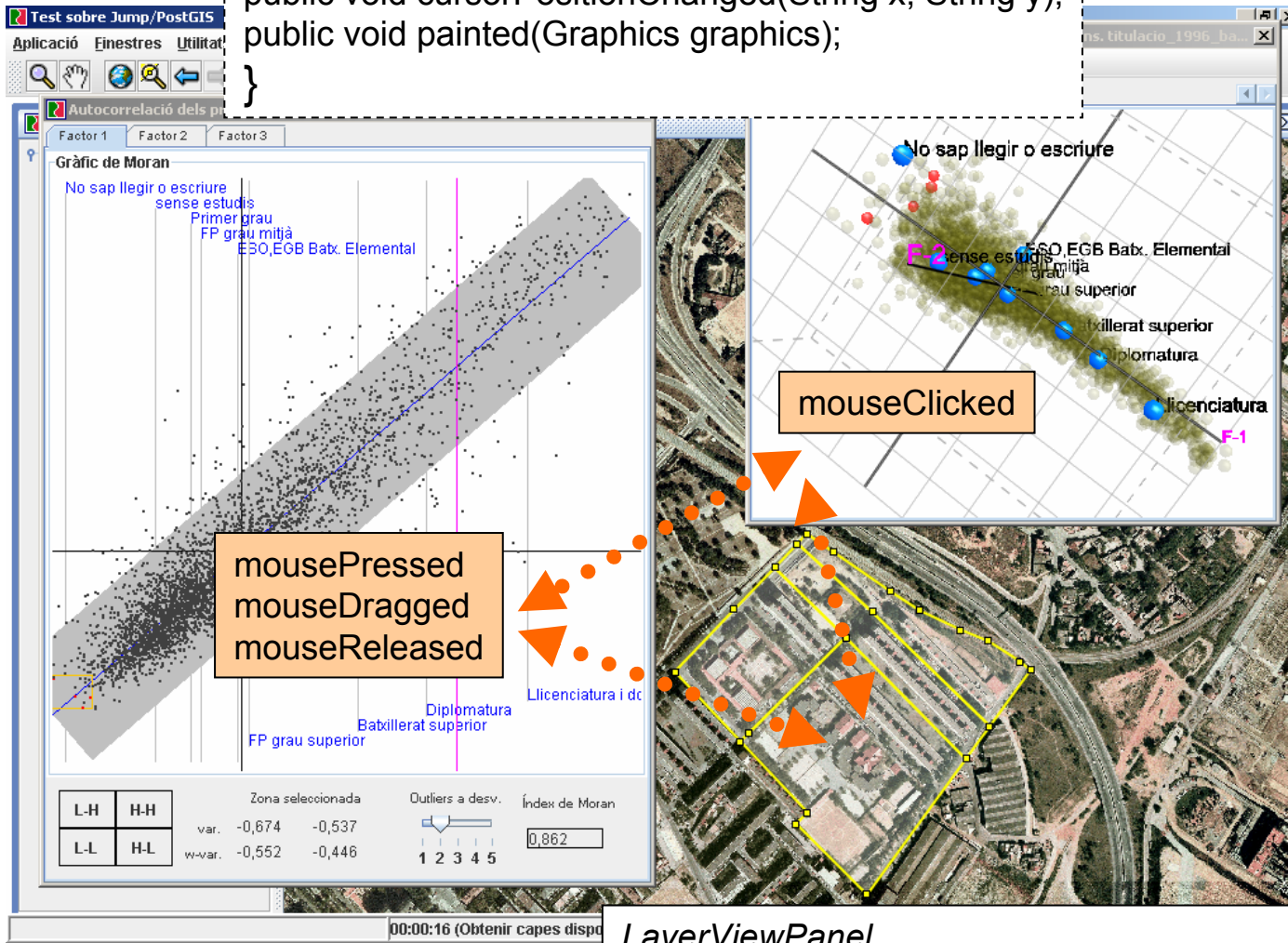
### <interface>Feature

- public abstract Geometry getGeometry()*
- public abstract FeatureSchema getSchema()*



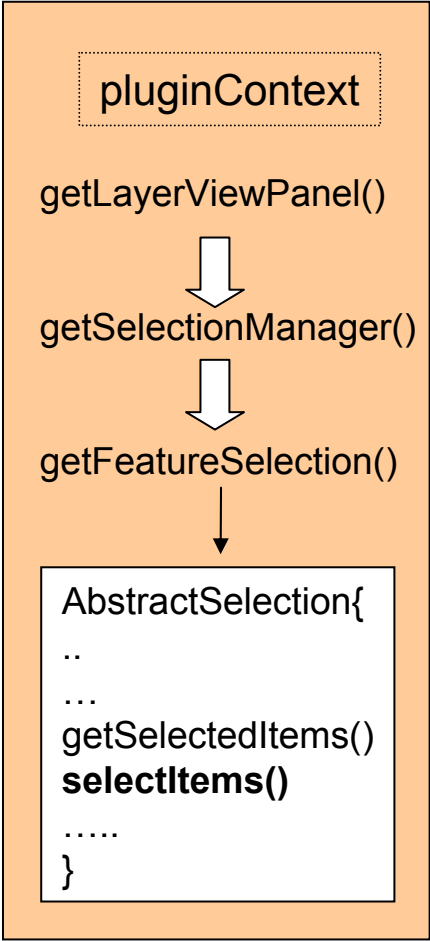
# Operaciones de selección

```
public interface LayerViewPanelListener {
    public void selectionChanged();
    public void cursorPositionChanged(String x, String y);
    public void painted(Graphics graphics);
}
```

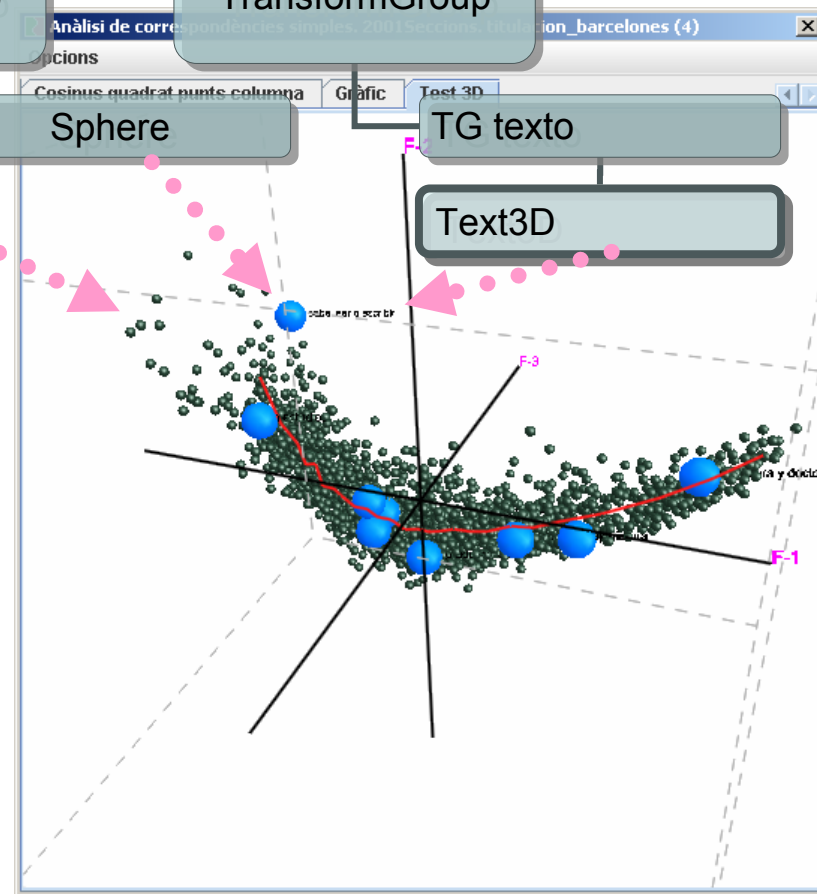
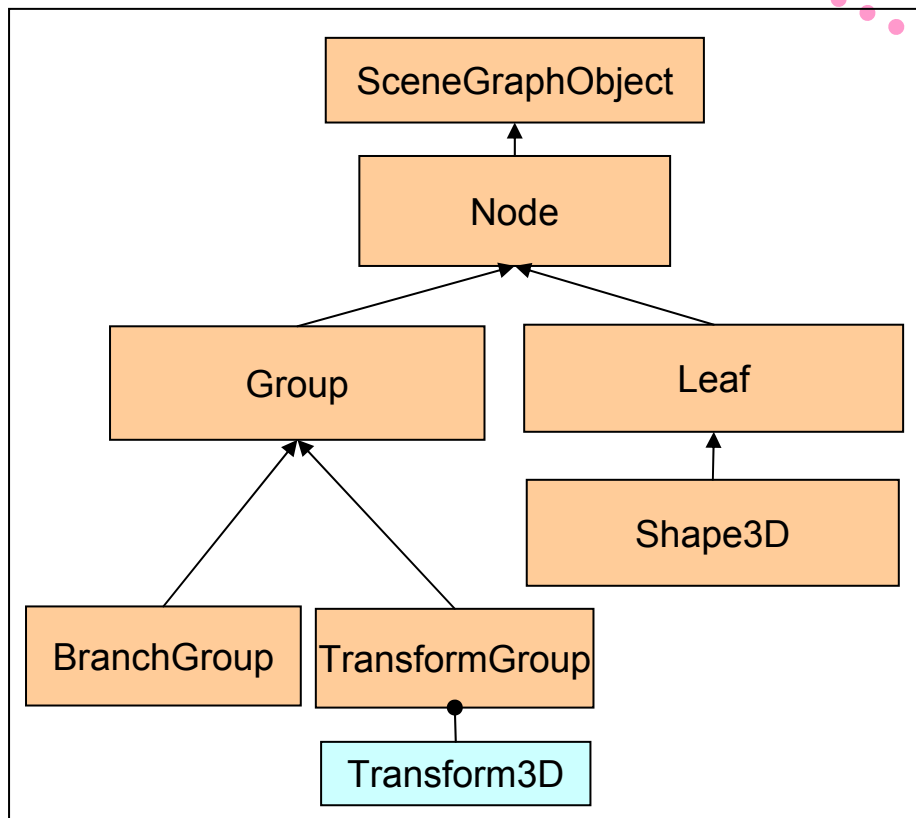
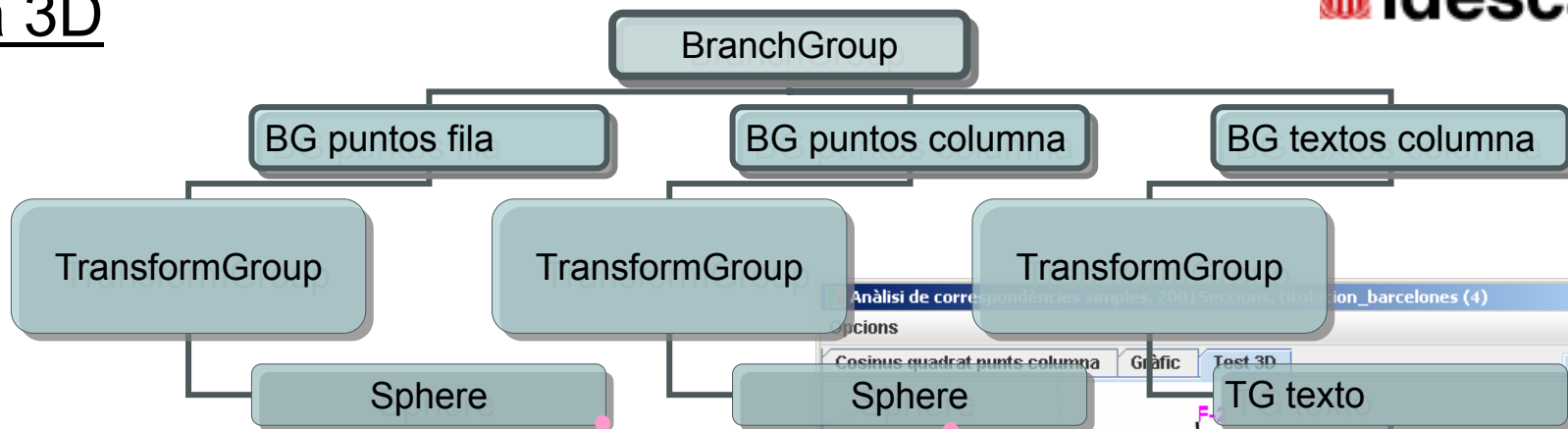


mousePressed  
mouseDragged  
mouseReleased

mouseClicked



```
LayerViewPanel
public void addListener(LayerViewPanelListener listener)
```





Opcions

Valors i vectors propis

Factor	Valor propi	% Explicat	% Explicat acumulat
1	15,5574	15,5574	15,5574
2	3,5904	19,1478	19,1478
3	2,2243	21,3721	21,3721
4	0,0133	23,1858	23,1858
5	0,0117	24,7772	24,7772
6	0,0084	25,9235	25,9235
7	0,0071	26,8952	26,8952
8	0,0062	27,7458	27,7458
9	0,0059	28,5569	28,5569
10	0,0053	29,2784	29,2784
11	0,0052	29,9854	29,9854
12	0,0050	30,6659	30,6659
13	0,0049	31,3392	31,3392
14	0,0047	31,9745	31,9745
15	0,0046	32,6025	32,6025
16	0,0045	33,2148	33,2148
17	0,0044	33,8157	33,8157
18	0,0043	0,5896	0,5896
19	0,0043	0,5831	0,5831
20	0,0043	0,5822	0,5822
21	0,0041	0,5757	0,5757
22	0,0041	0,5654	0,5654
23	0,0041	0,5571	0,5571
24	0,0041	0,5547	0,5547

Estructura

214  
grados de libertad  
 $100/214=0,47$

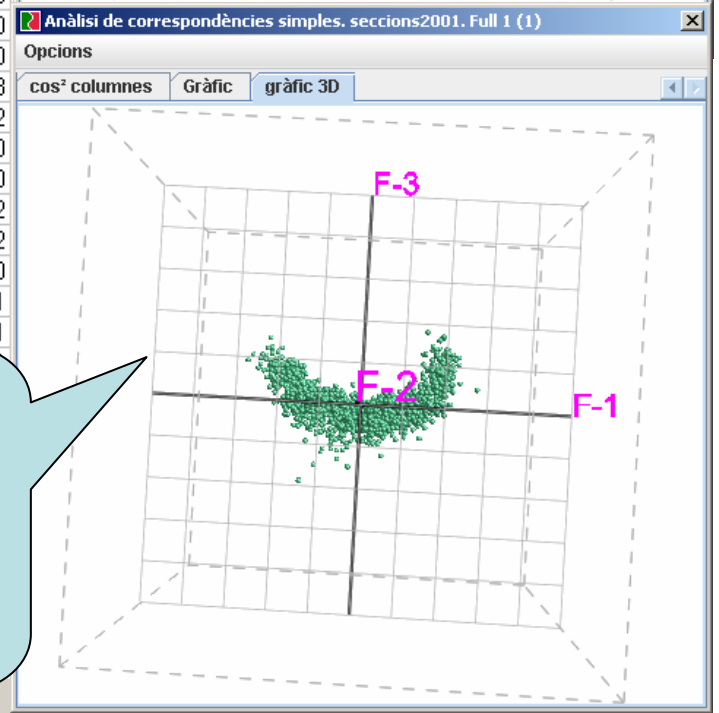
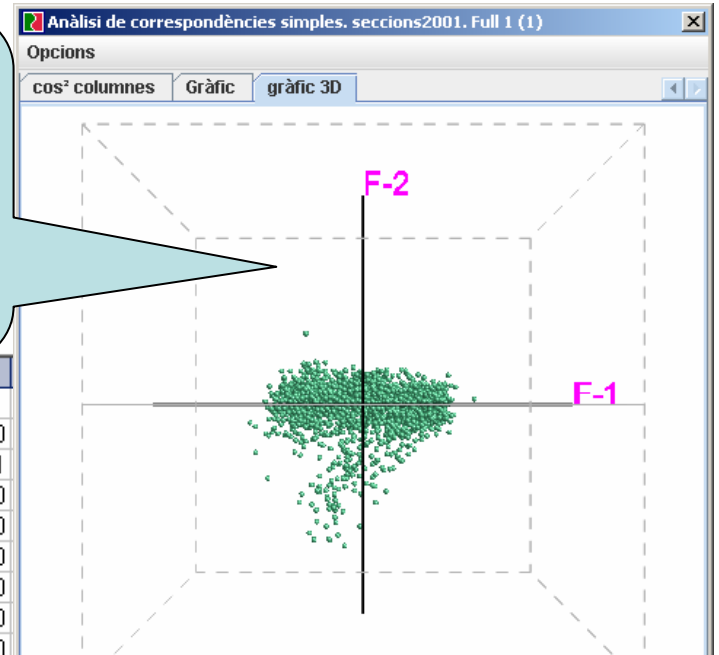
Ruido

Plano F1-F2  
19% inercia total

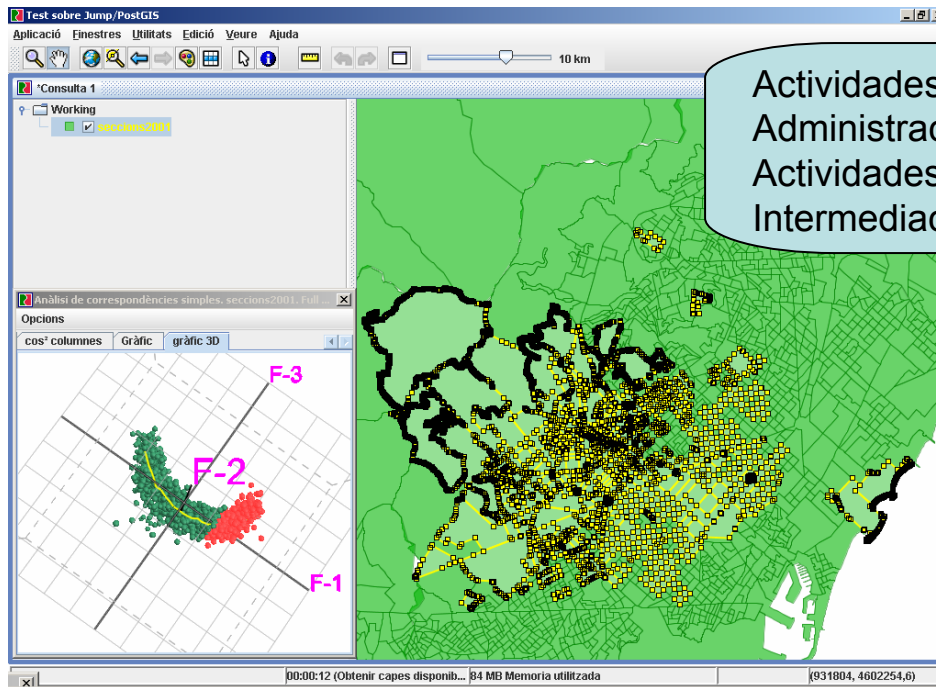
Eje F2 contribución  
muy alta de  
553 : Restaurantes  
950 Personal  
domestico

Plano F1-F3  
17.8% inercia total

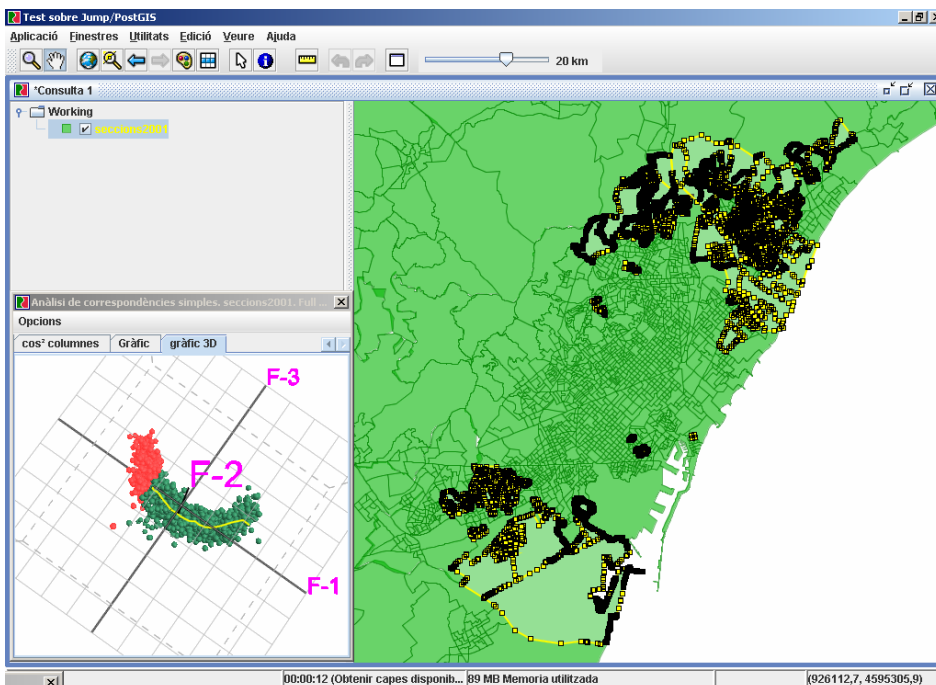
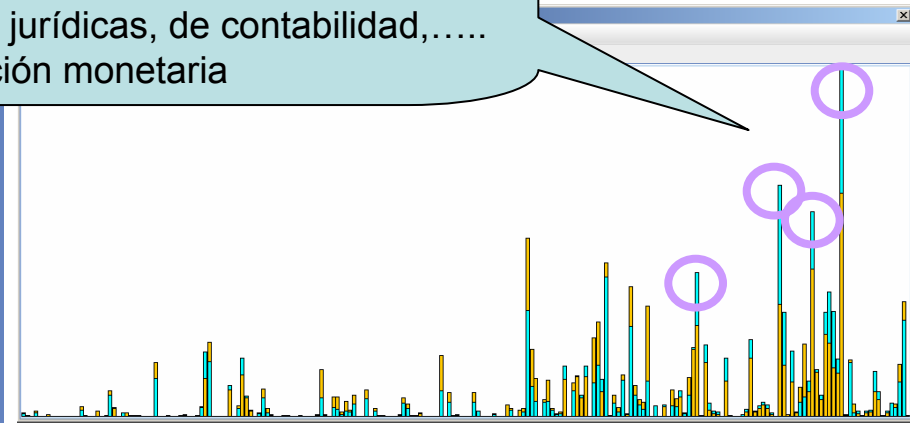
Efecto Guttman  
F1 opone ciertas  
actividades frente a otras  
F3 no tiene un significado  
claro



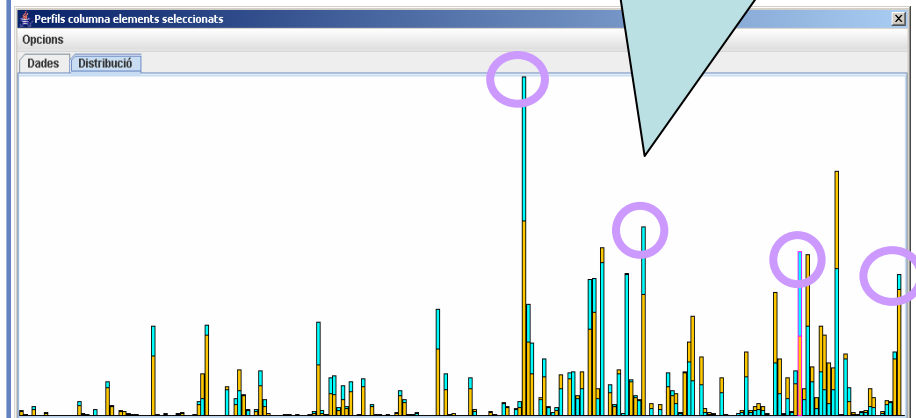


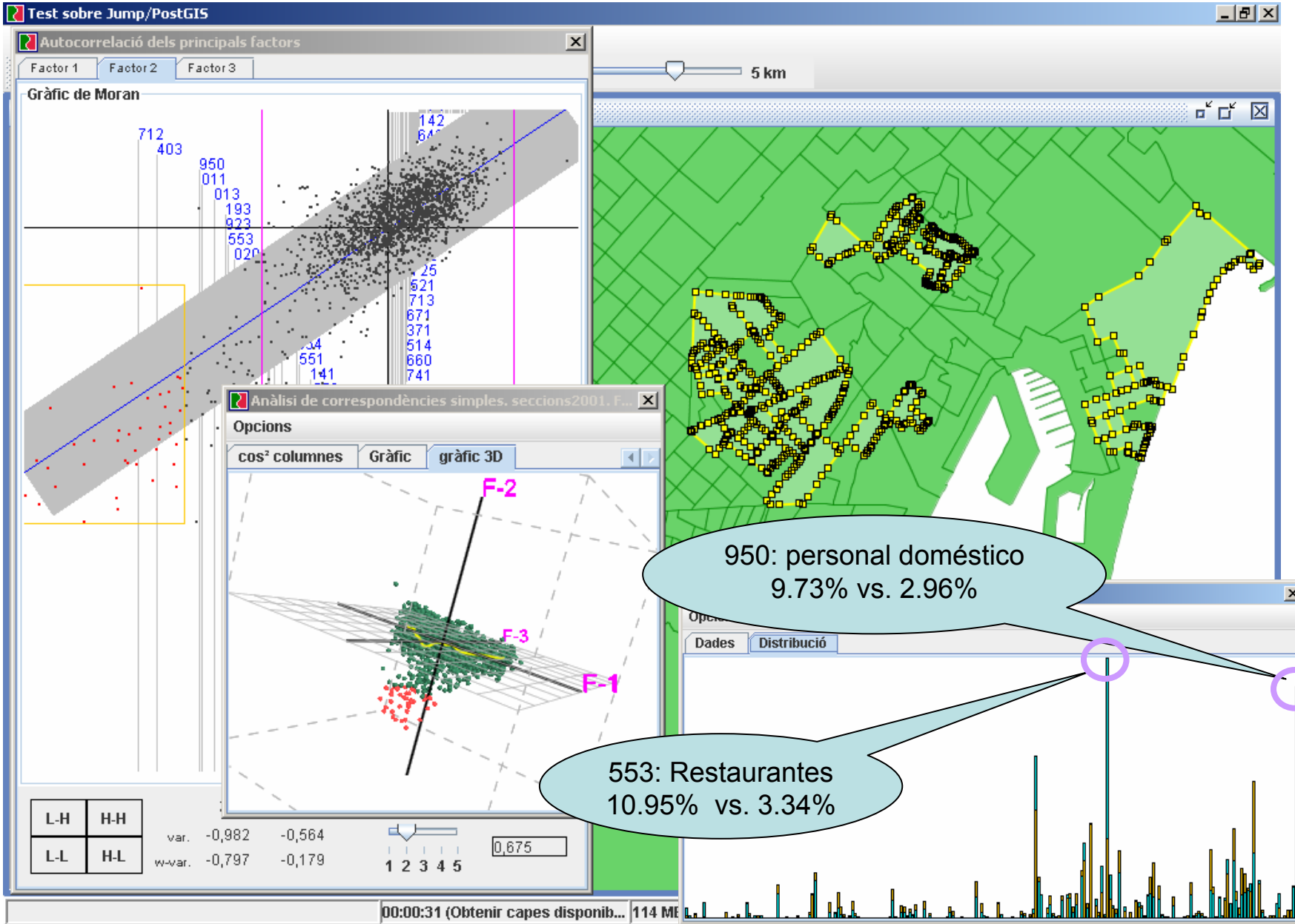


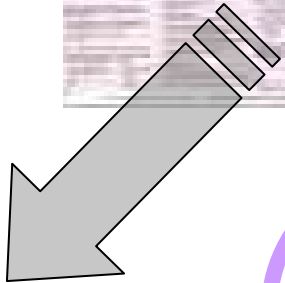
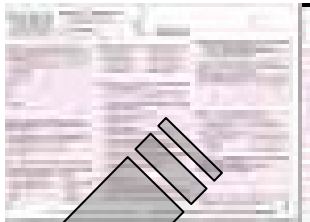
Actividades sanitarias  
Administración Pública  
Actividades jurídicas, de contabilidad,.....  
Intermediación monetaria



Construcción general de inmuebles  
Personal doméstico  
Transporte terrestre  
Actividades industriales de limpieza





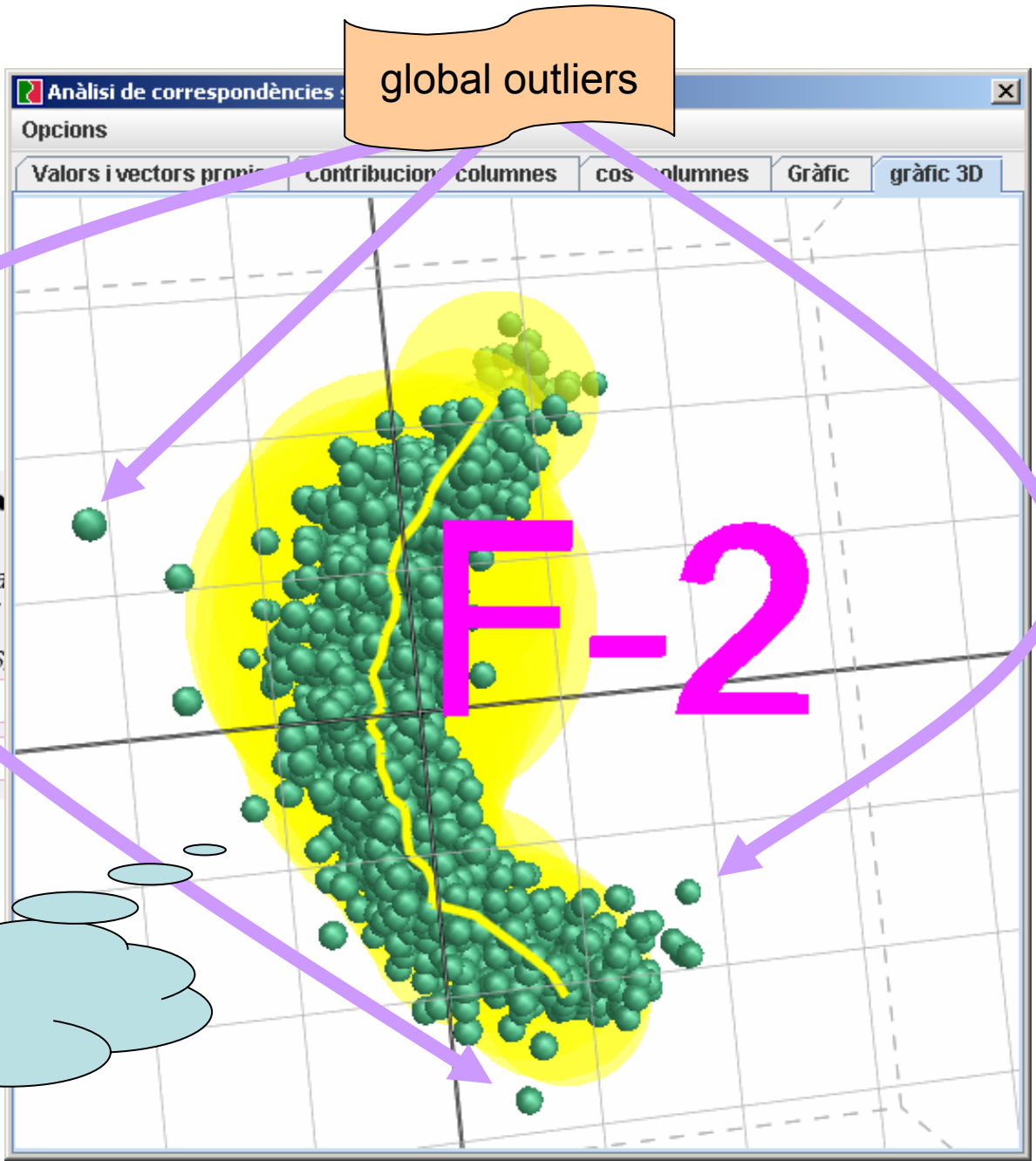


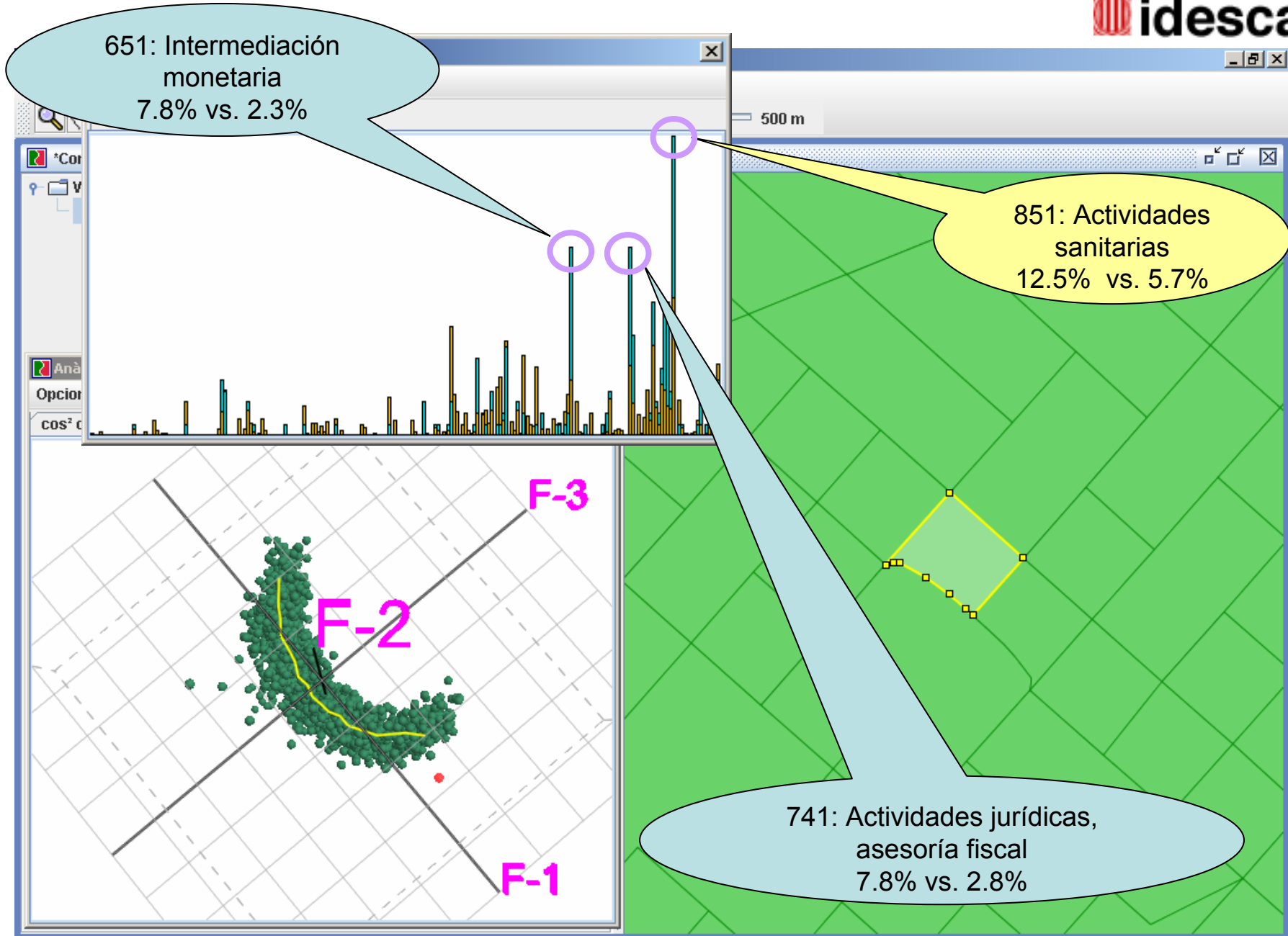
**8 ¿Cuál es la actividad principal o local donde trabajaba?**

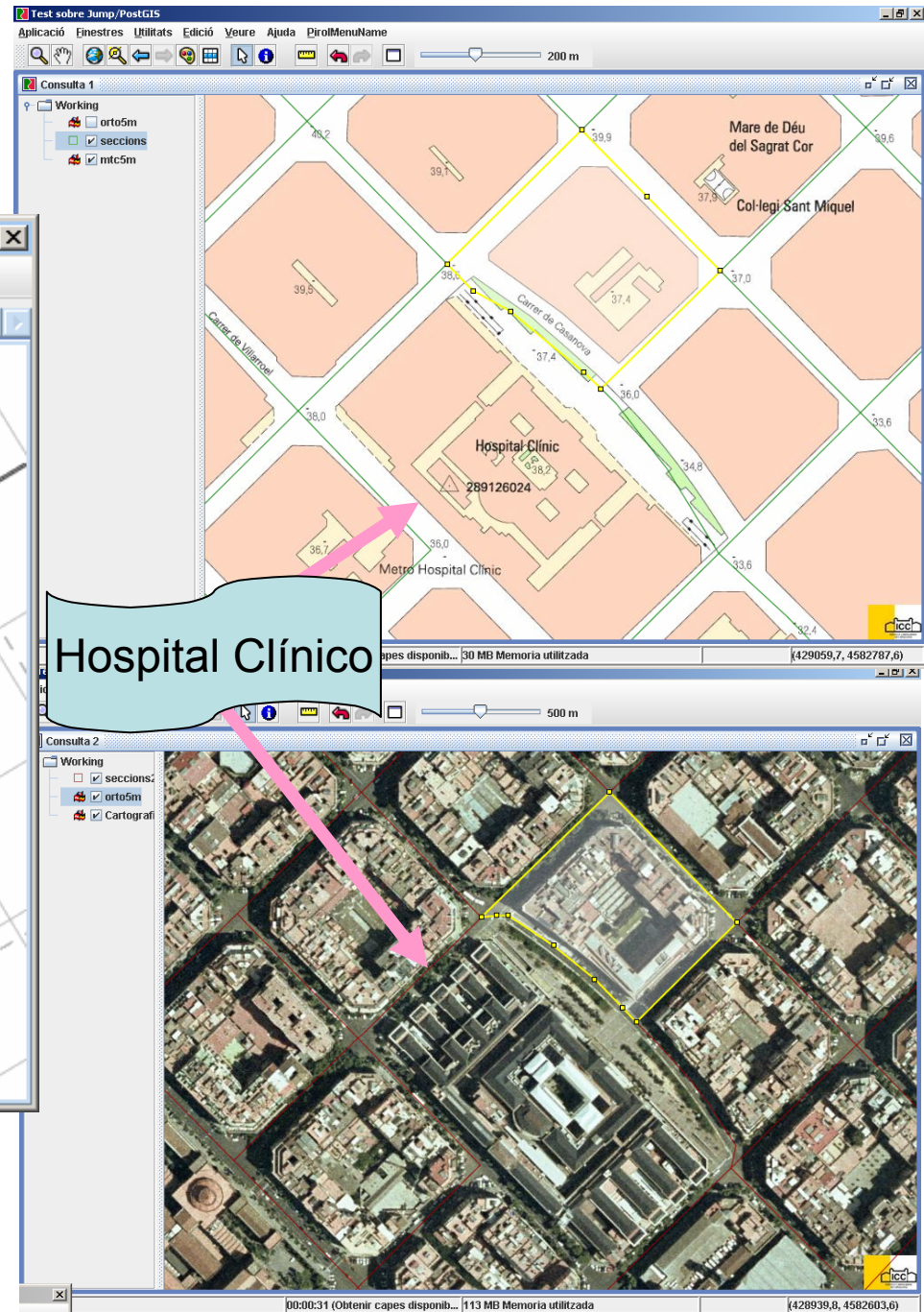
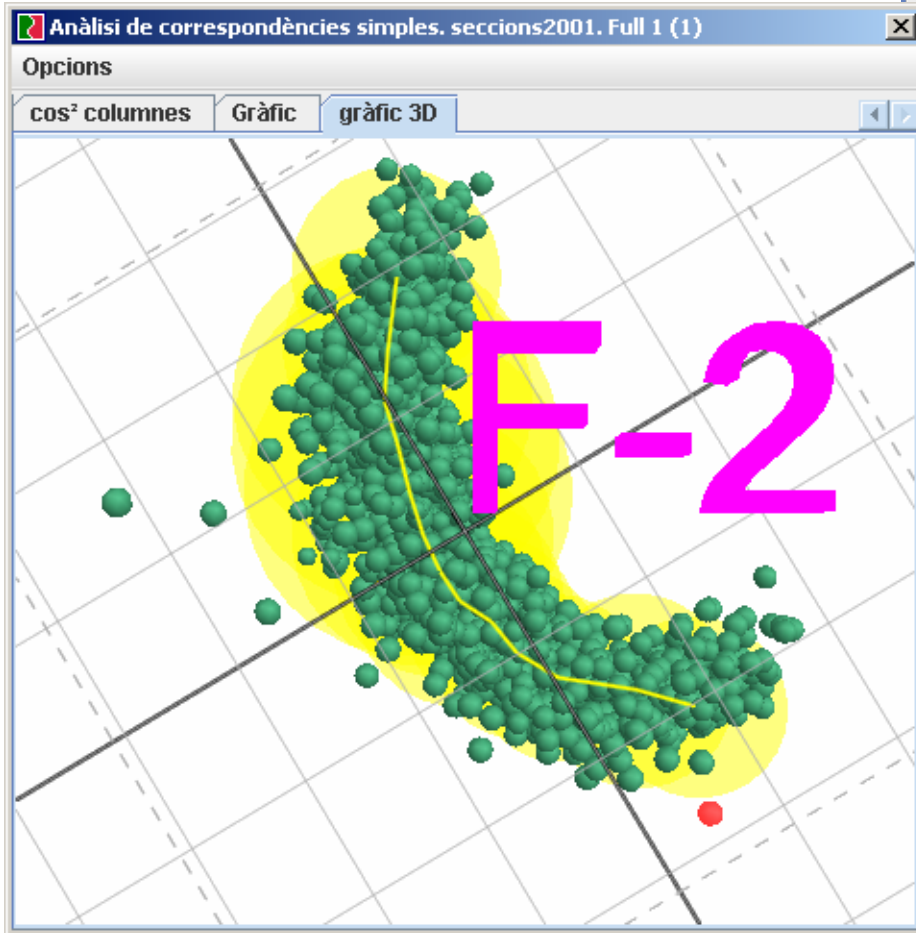
Búsquela en la TABLA DE ACTIVIDADES (en la de título rojo) y anote el número que la recoge:  
Si no ha encontrado la actividad o tiene dudas

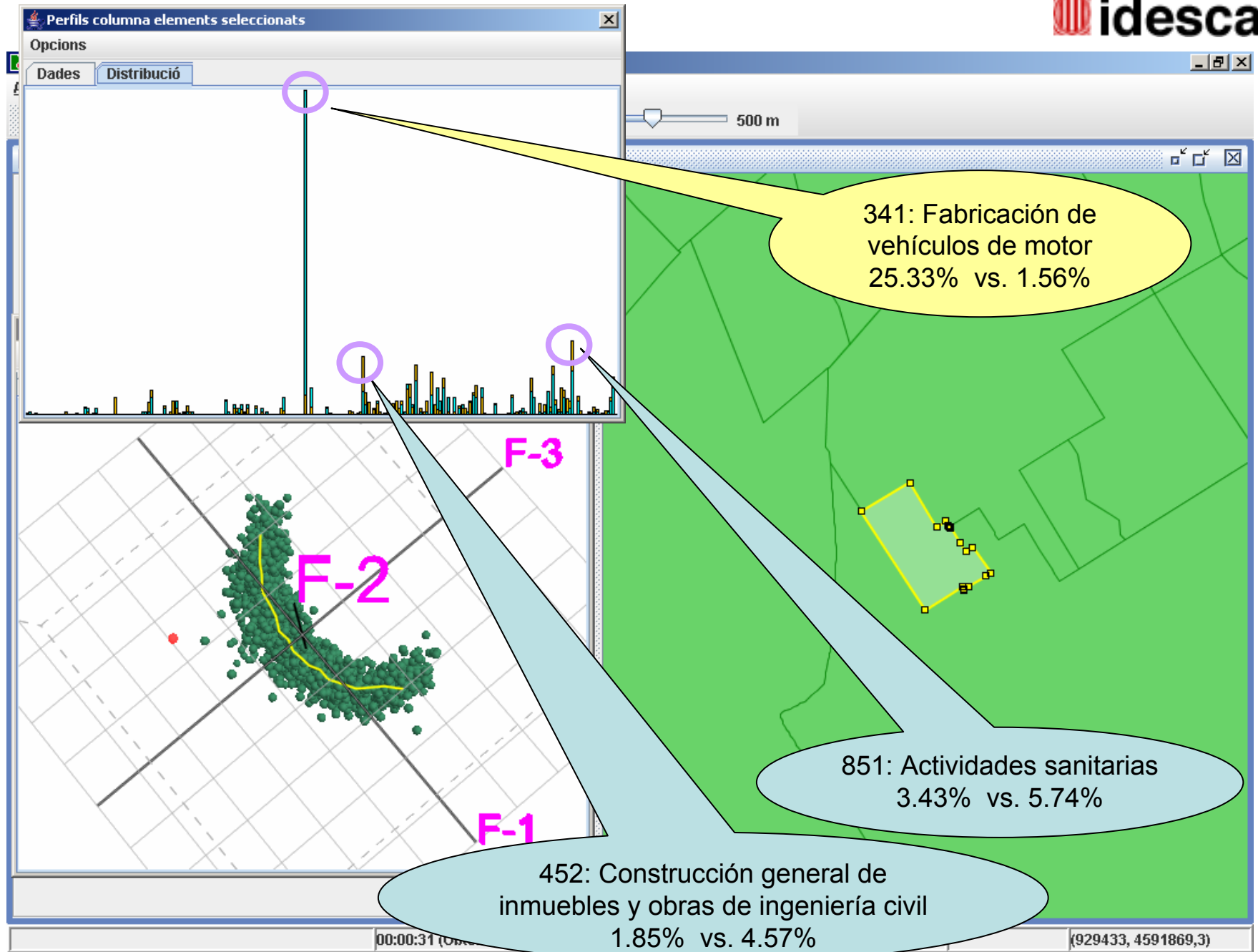
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

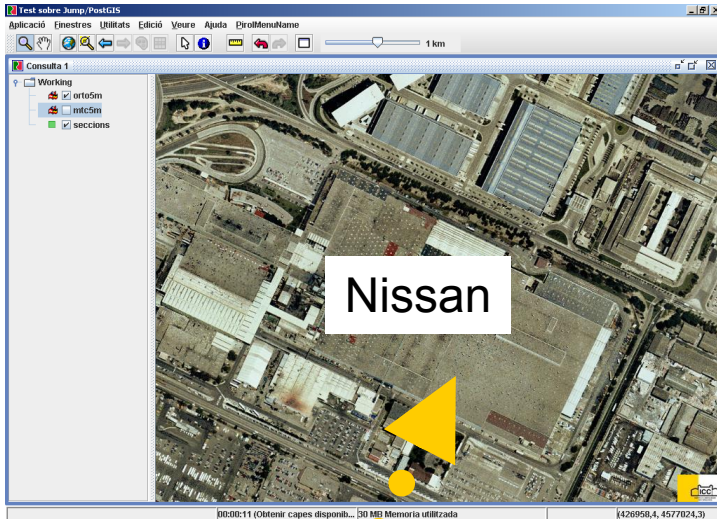
**! En el subespacio formado por F1-F3 !**



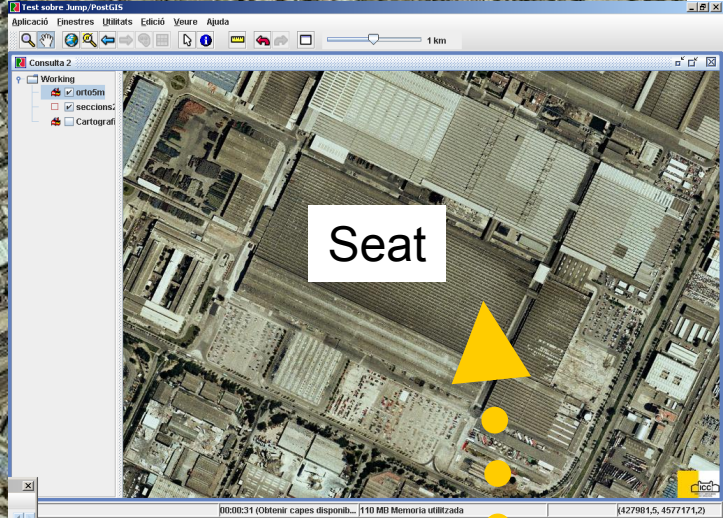
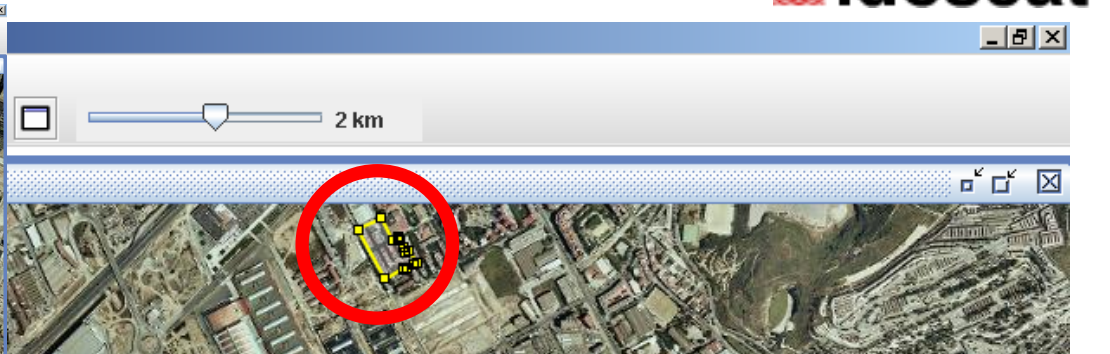








Nissan



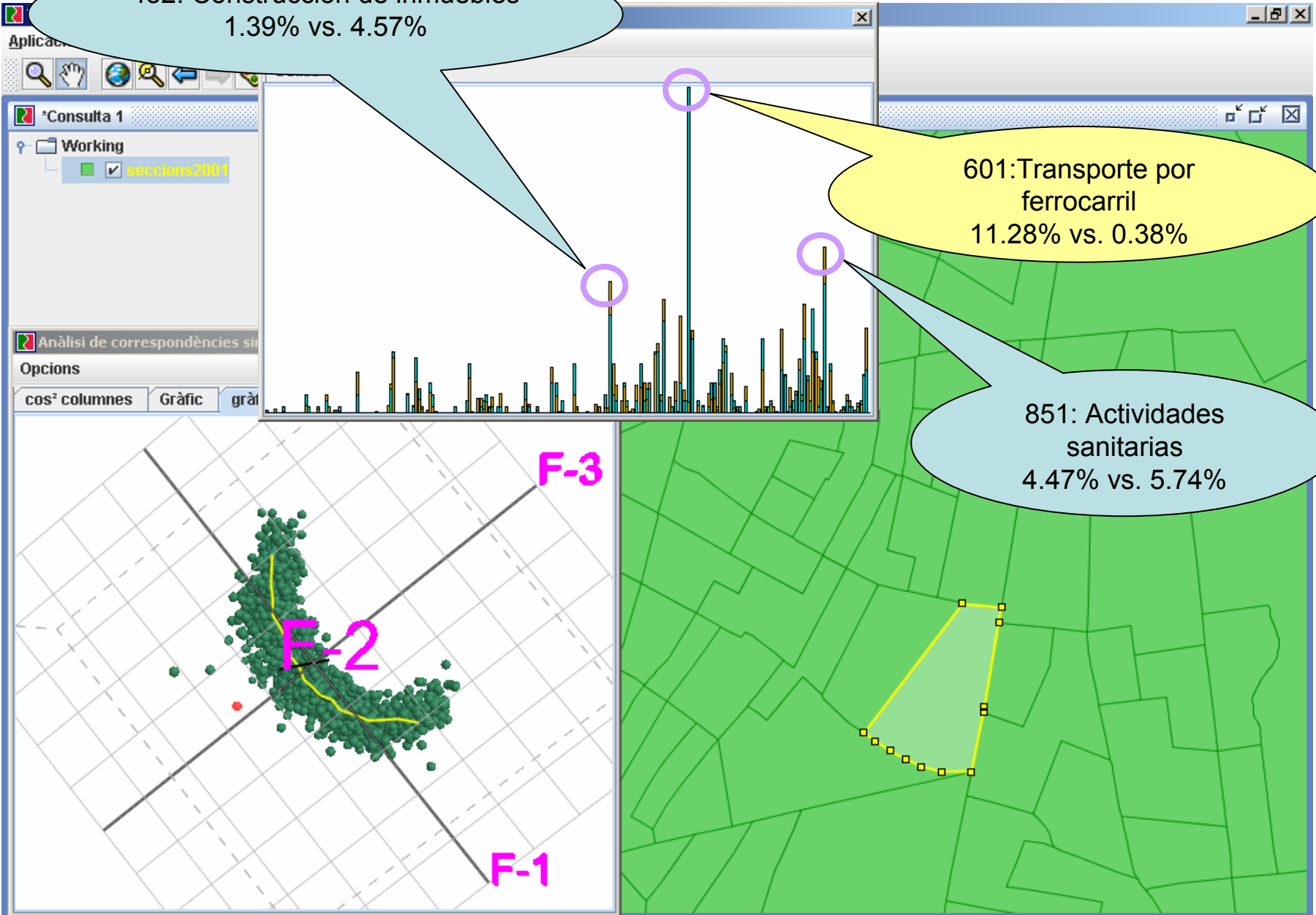
Seat



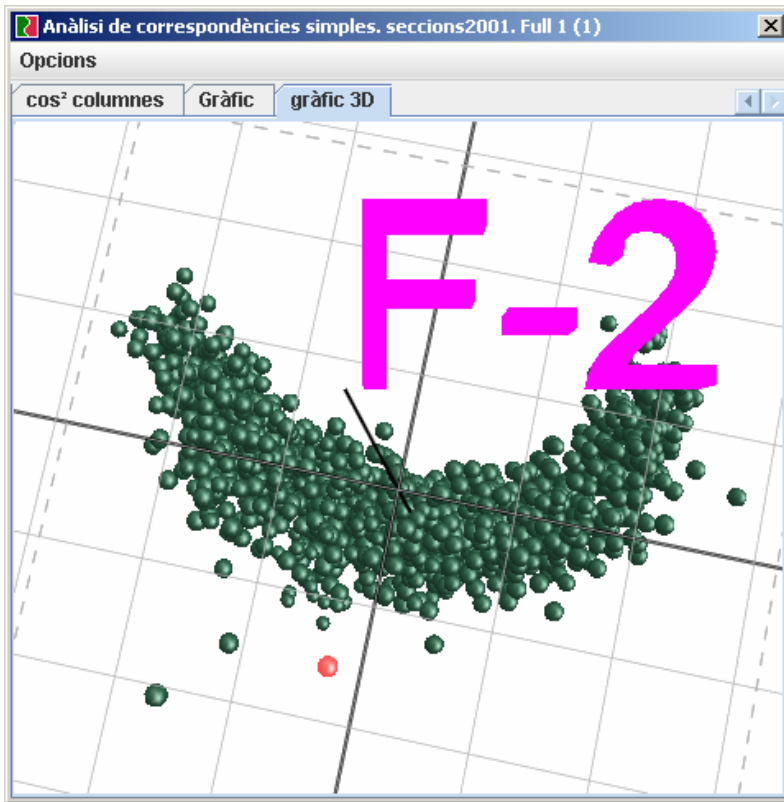
452: Construcción de inmuebles  
1.39% vs. 4.57%

601: Transporte por ferrocarril  
11.28% vs. 0.38%

851: Actividades sanitarias  
4.47% vs. 5.74%

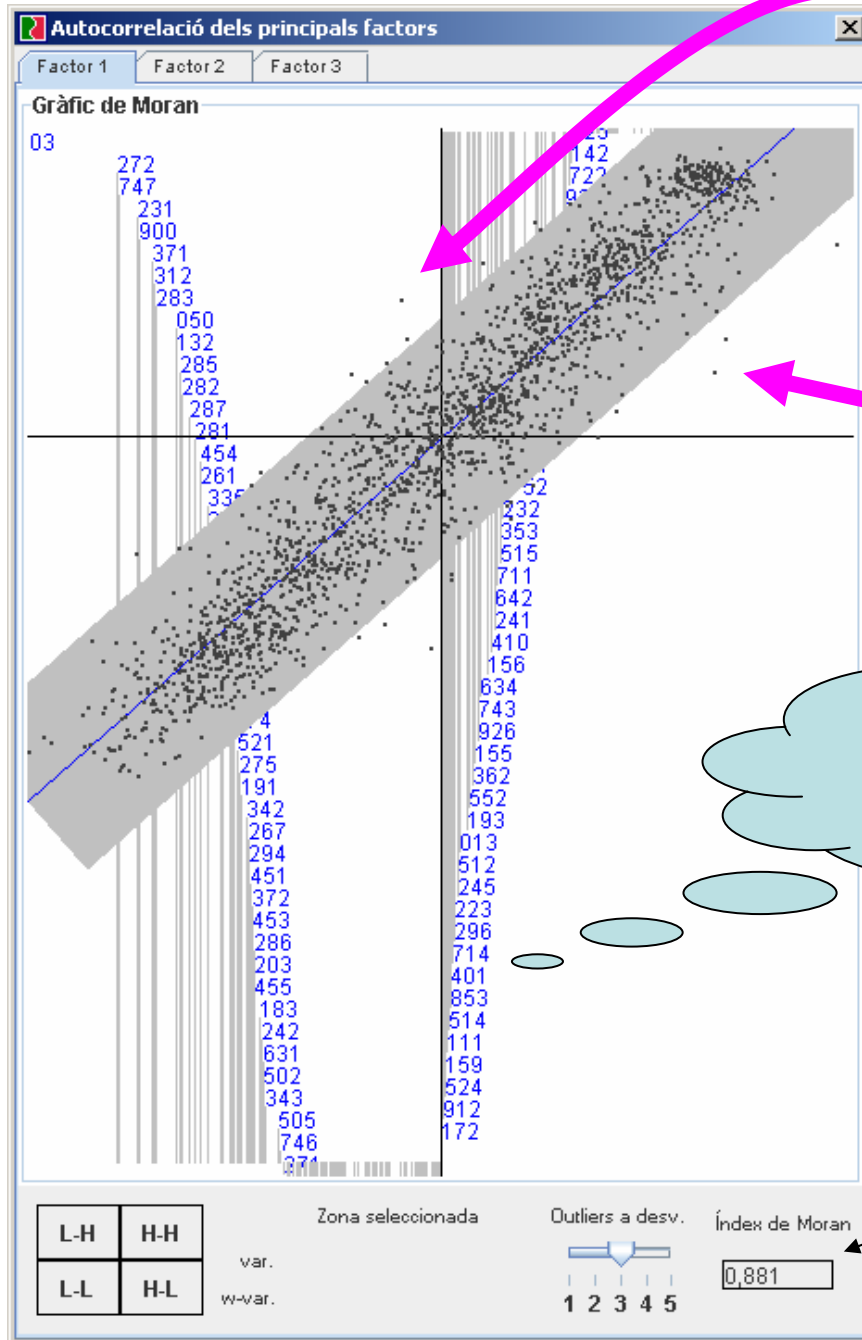






*... Can Dragó ocupa una parte de lo que fueron terrenos de la Renfe ....*

extraído de [www.noubarris.net](http://www.noubarris.net)



Outliers espaciales

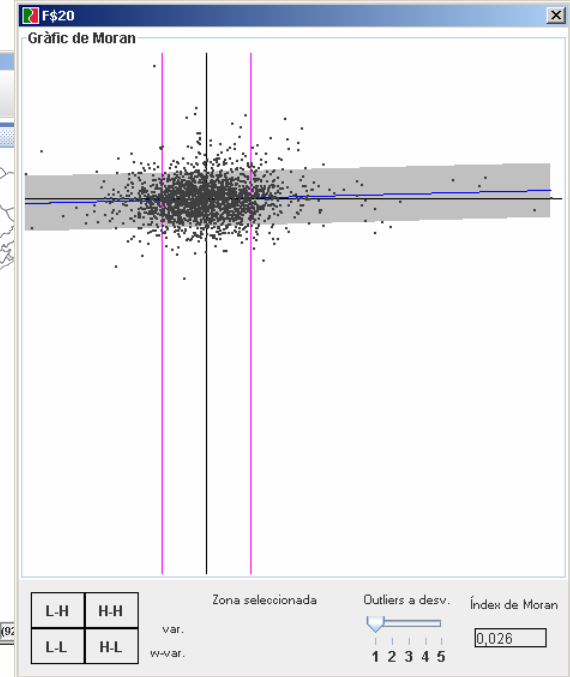
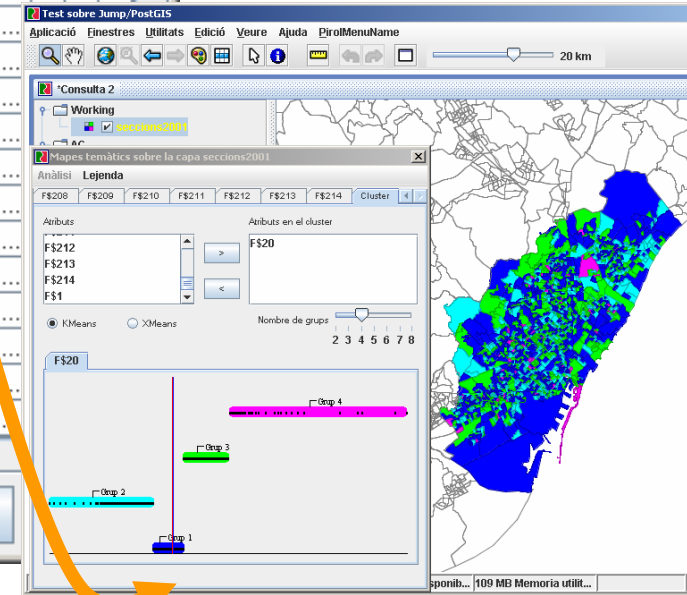
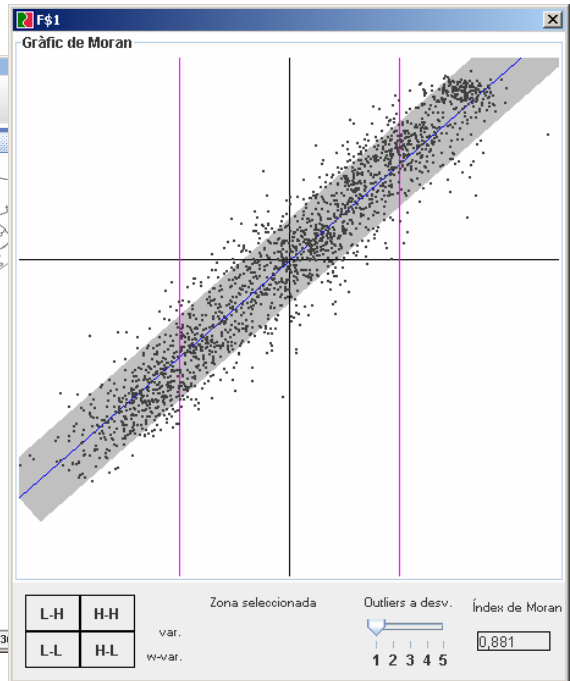
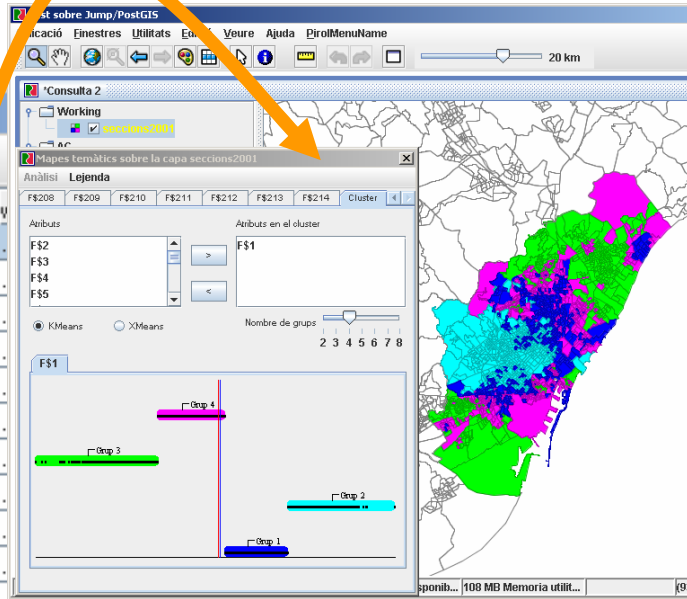
! En relación a las coordenadas sobre el factor F1 !

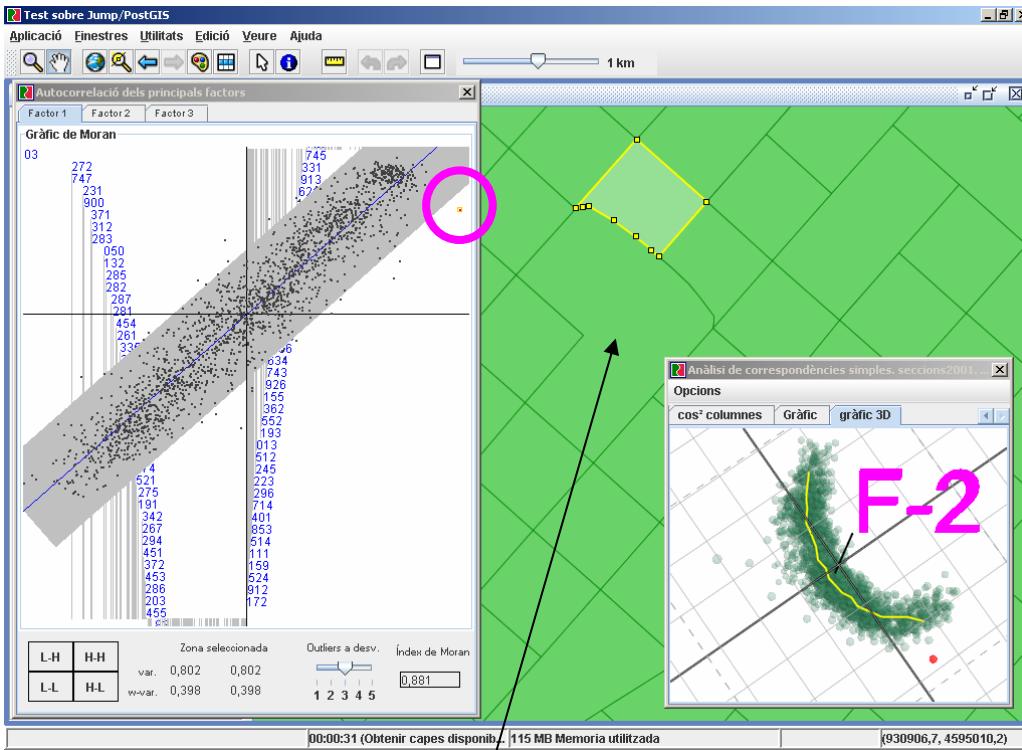
$$I = \frac{n}{\sum_{i=1}^n \sum_{j=1}^n w_{ij}} \frac{\sum_{i=1}^n \sum_{j=1}^n w_{ij} (y_i - \bar{y})(y_j - \bar{y})}{\sum_{i=1}^n (y_i - \bar{y})^2}$$

# Estructura

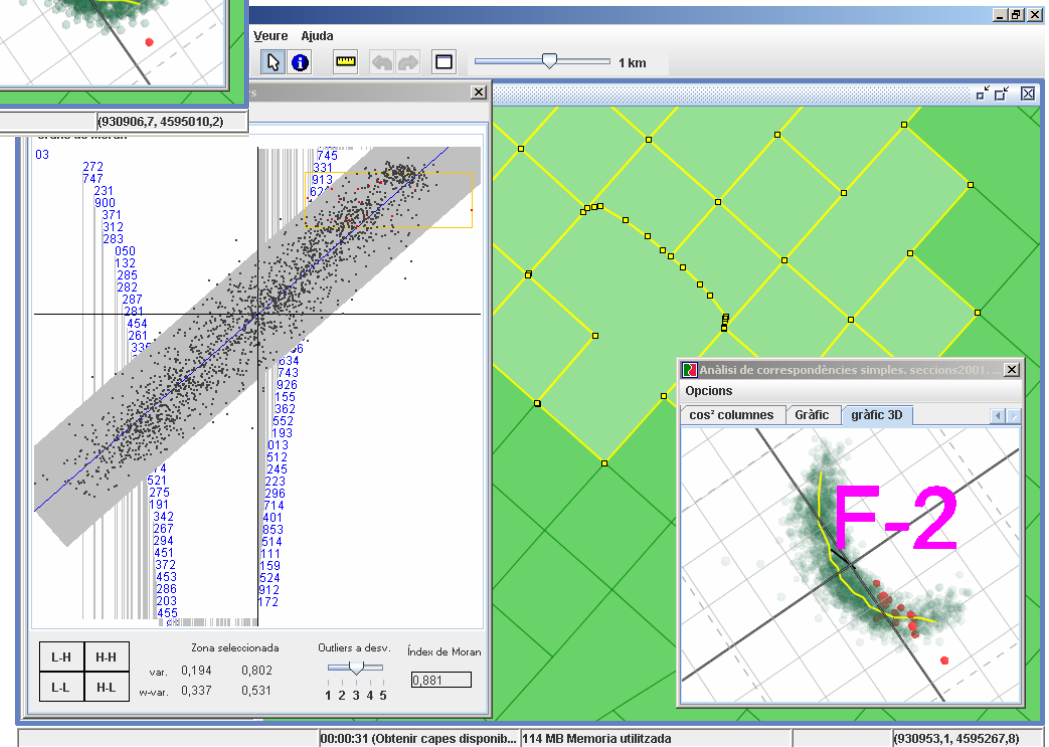
variable	index de Moran
F\$1	0,881
F\$2	0,675
F\$3	0,695
F\$4	0,503
F\$5	0,495
F\$6	0,165
F\$7	0,307
F\$8	0,206
F\$9	0,189
F\$10	0,128
F\$11	0,153
F\$12	0,093
F\$13	0,086
F\$14	0,069
F\$15	0,095
F\$16	0,032
F\$17	0,02
F\$18	0,024
F\$19	0,069
F\$20	0,026
F\$21	0,036
F\$22	0,011
F\$23	0,054
F\$24	0,023
F\$25	0,027

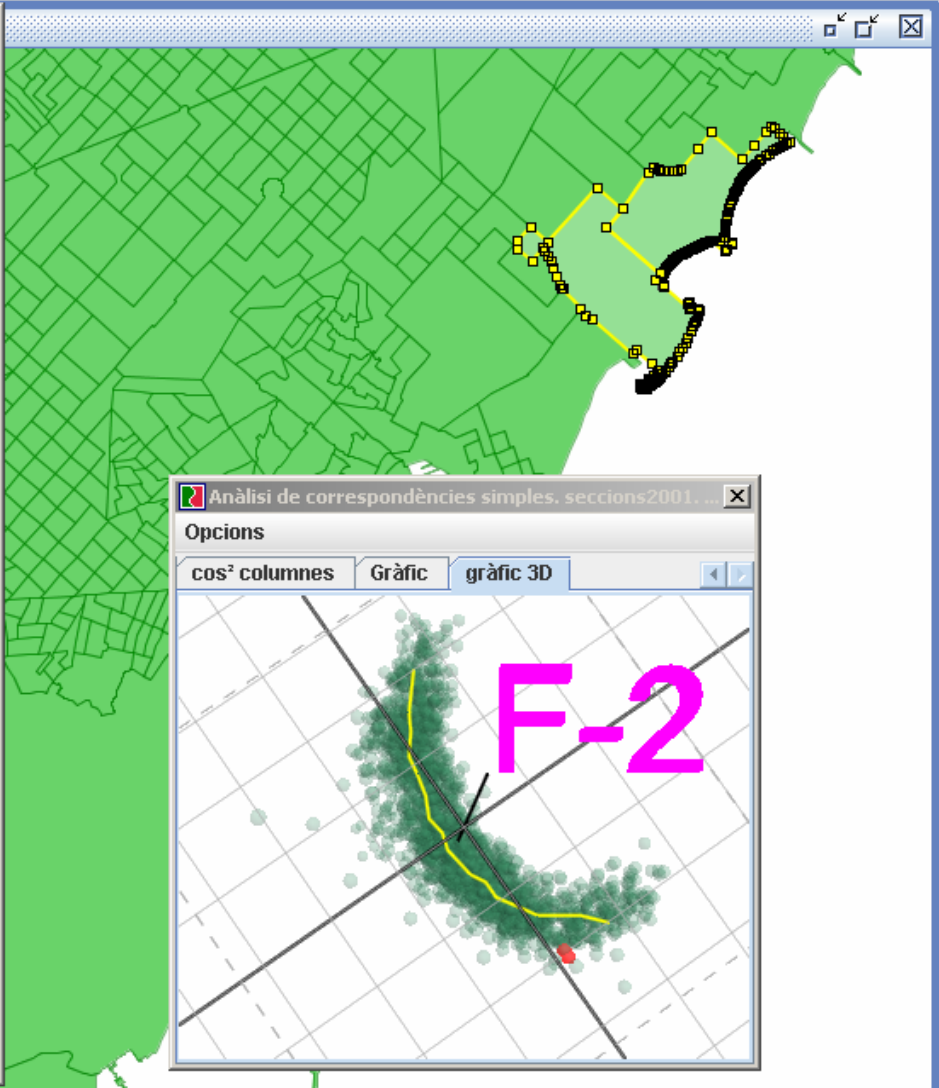
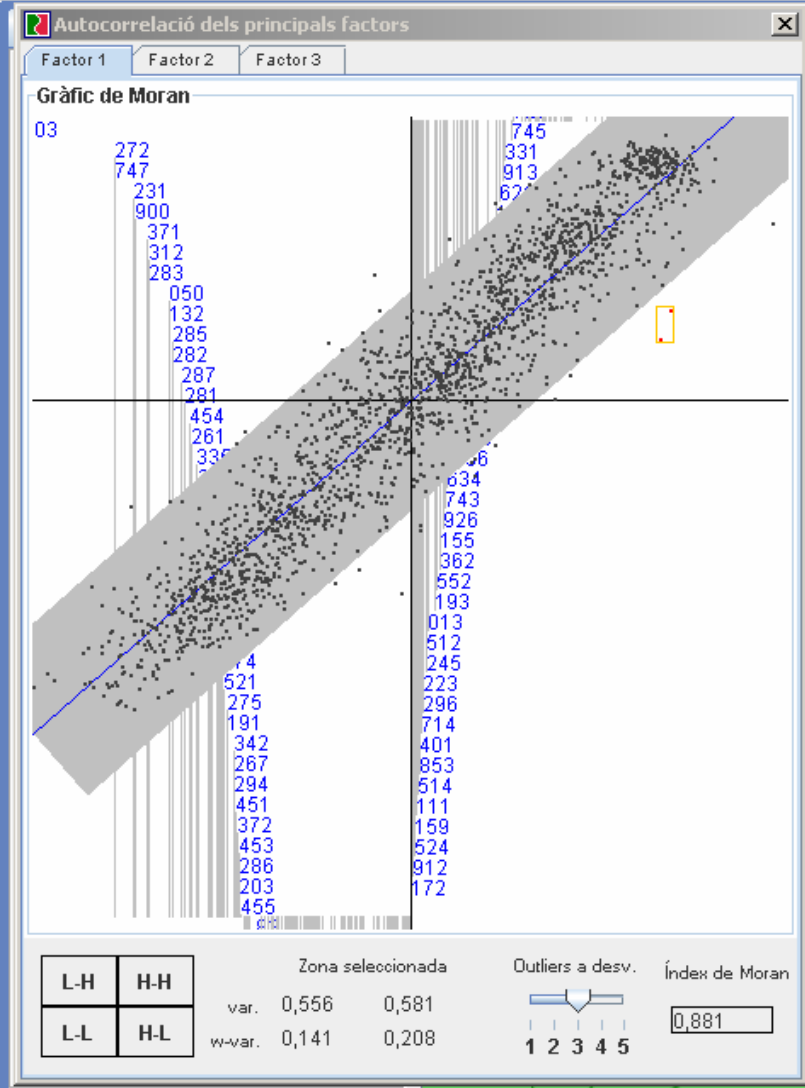
# Ruido

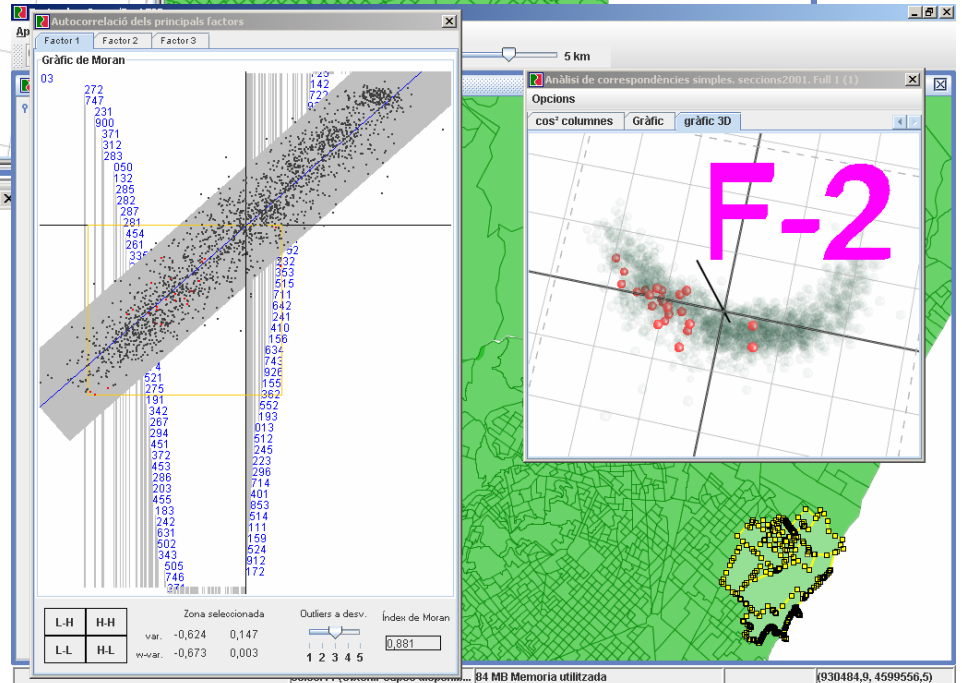
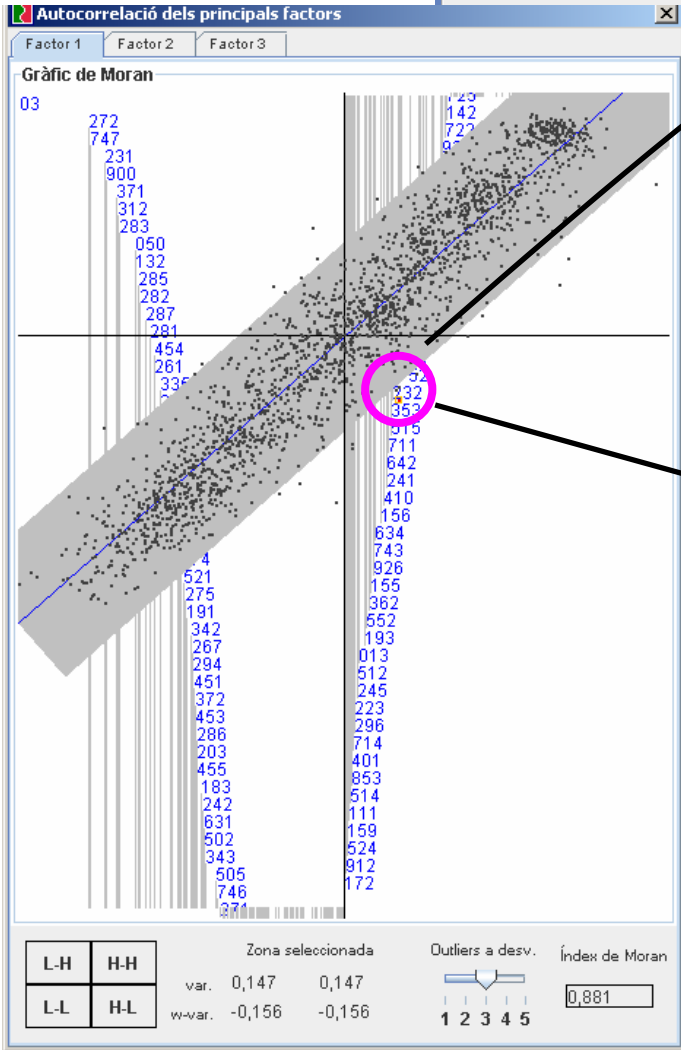
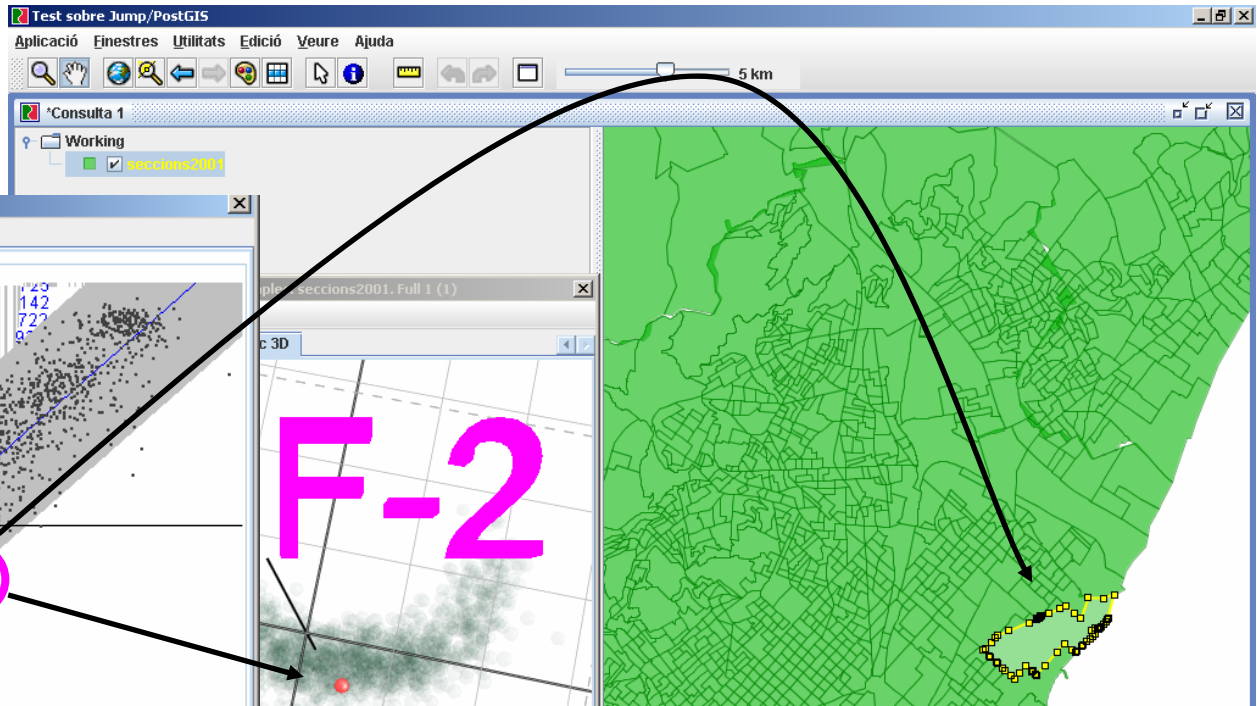


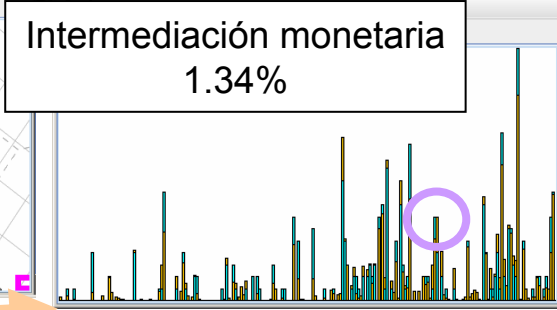
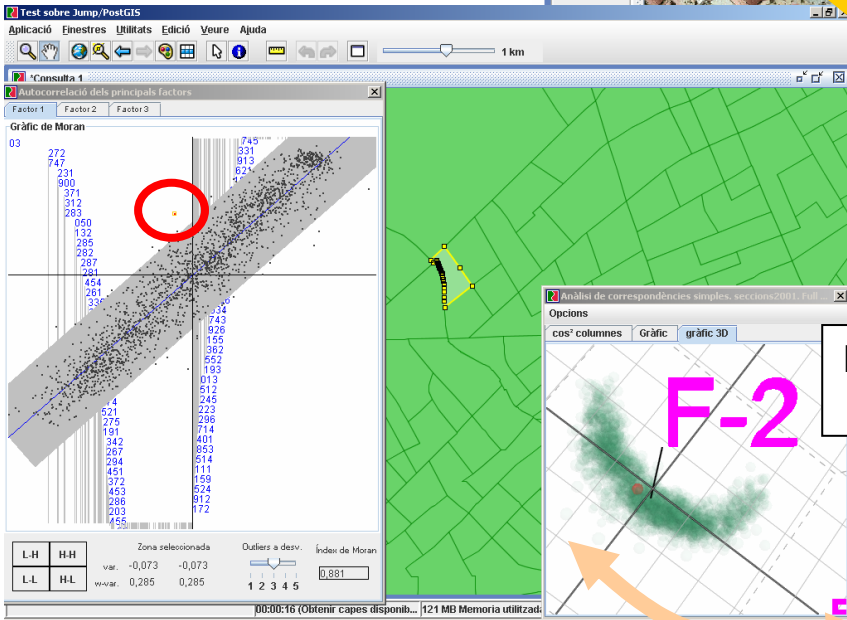
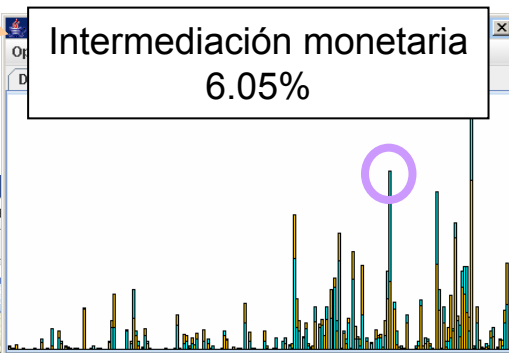
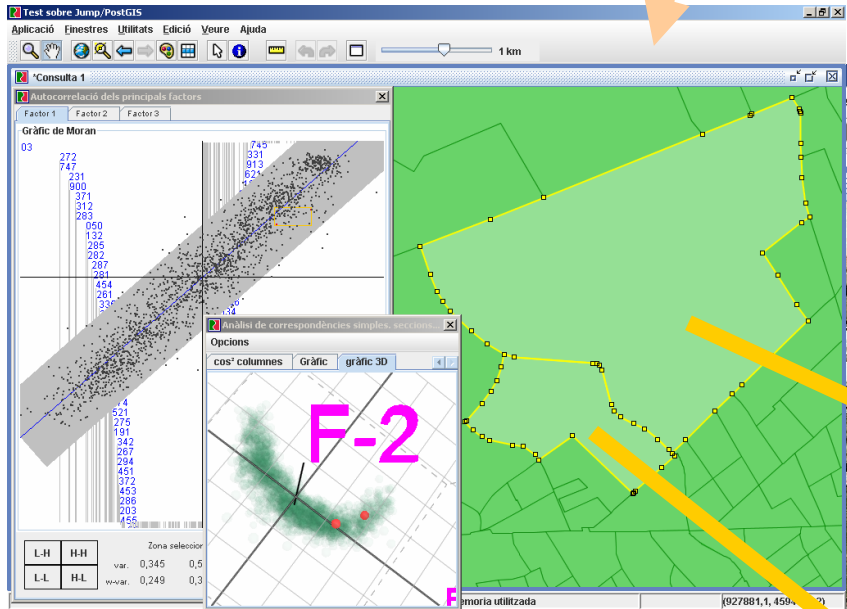


Hospital Clínic







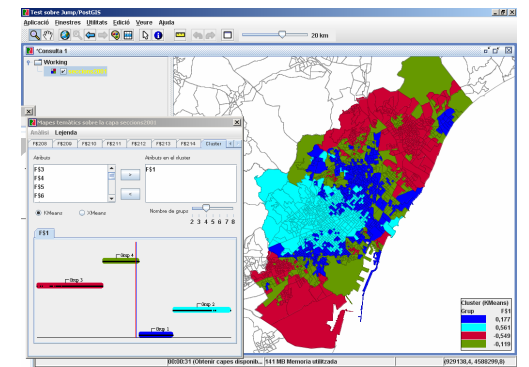
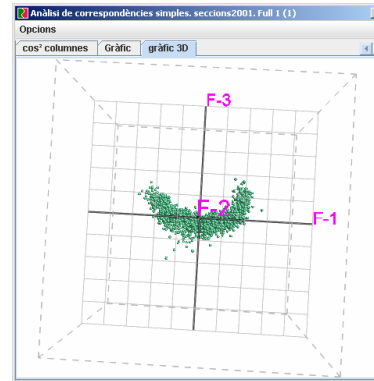


## Actividad a 3 dígitos

G.L. 214

Inercia explicada F1-F3 17.8%

$I(F1) = 0.881$

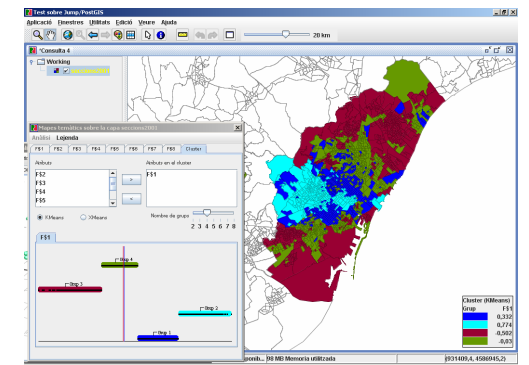
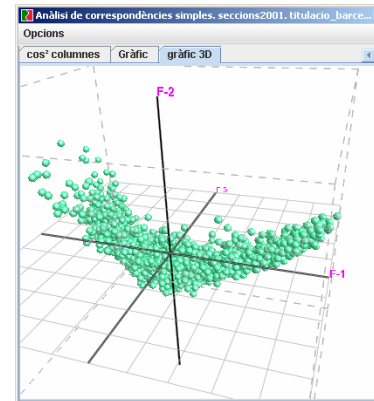


## Titulación

G.L. 8

Inercia explicada F1-F2 85.72%

$I(F1) = 0.882$

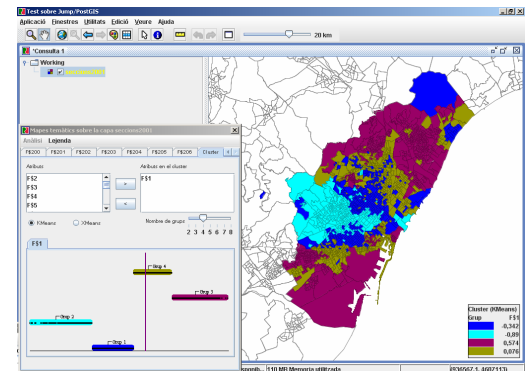
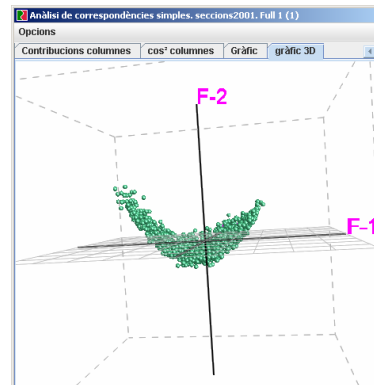


## Ocupación a 3 dígitos

G.L. 206

Inercia explicada F1-F2 29.13%

$I(F1) = 0.9$



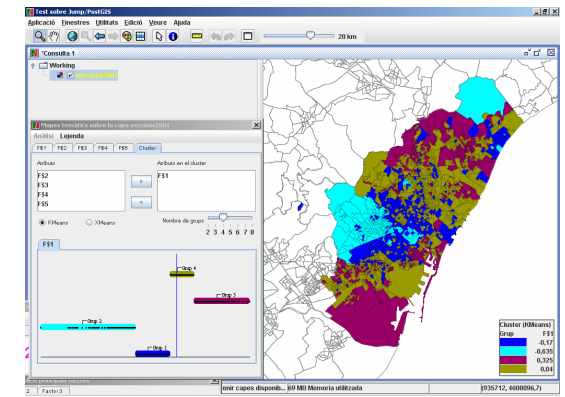
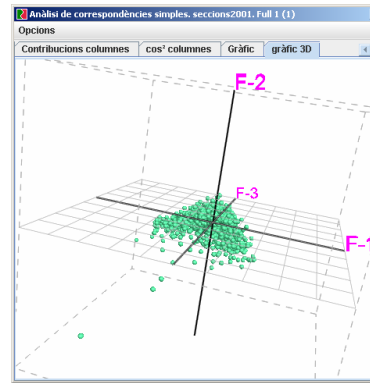


## Situación profesional

G.L: 5

Inercia explicada F1-F2 77.78%

$I(F1) = 0.728$

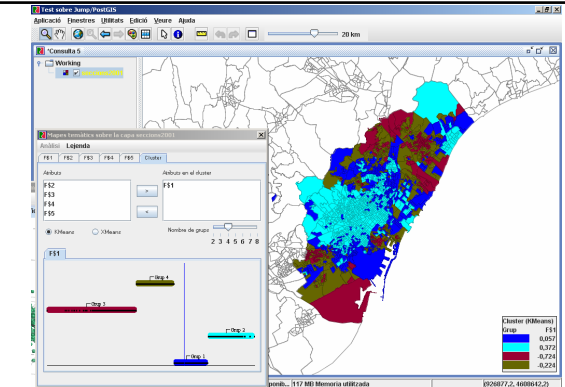
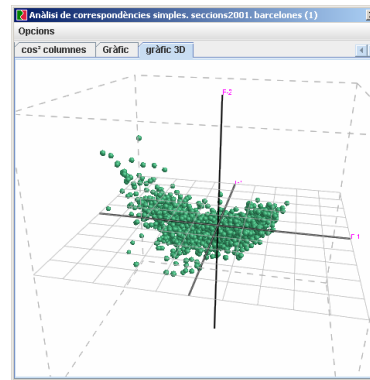


## Conocimiento del catalán

G.L: 5

Inercia explicada F1-F2 86.68%

$I(F1) = 0.781$



## Edad (6 intervalos)

G.L: 5

Inercia explicada F1-F2 76.79%

$I(F1) = 0.408$

