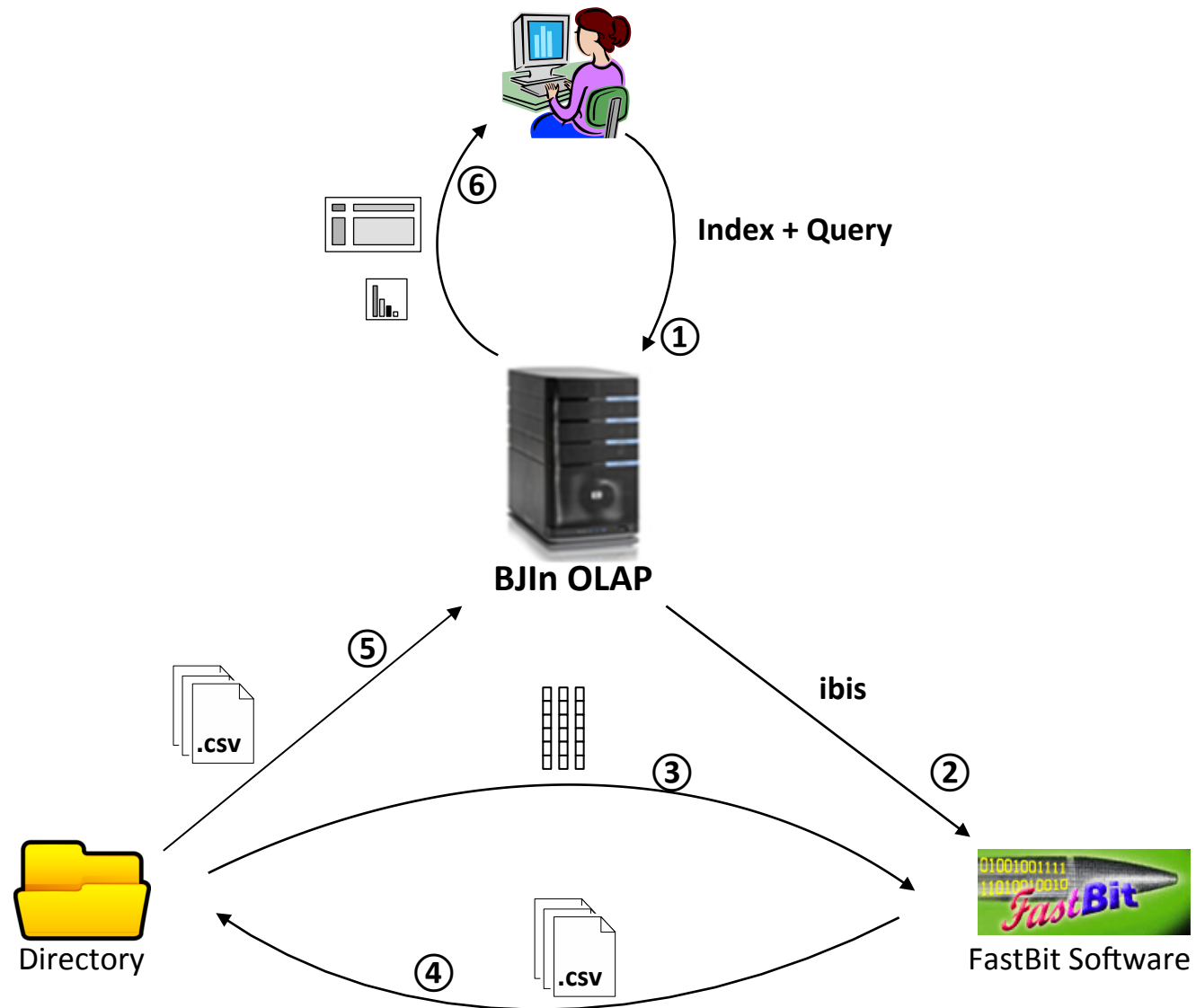


Consultando um índice



Consultando um índice

Query Index

localhost:8080/bjin-web/ControllerServlet

BJIn
Bitmap Join Index

Main Upload XML Create Index Query Drop Index

Edit columns Show log Exchange BJIn

Available Columns

- Dimension: Date
 - Hierarchy: Year
 - Level: d_year
- Dimension: Supplier
 - Hierarchy: Supplier
 - Level: s_region
 - Level: s_nation
- Dimension: Customer
 - Hierarchy: Customer
 - Level: c_region
 - Level: c_nation
- Measure: lo_revenue

Query Bitmap Join Index: indice

Submit Query

Visualização das
colunas disponíveis
para consultar

Consultando um índice

Query Index

localhost:8080/bjin-web/ControllerServlet

BJIN

Main Upload XML Create Index Query Drop Index

Edit columns Show log Exchange BJIn

Available Columns

- Dimension: Date
 - Hierarchy: Year
 - Level: d_year
- Dimension: Supplier
 - Hierarchy: Supplier
 - Level: s_region
 - Level: s_nation
- Dimension: Customer
 - Hierarchy: Customer
 - Level: c_region
 - Level: c_nation
- Measure: lo_revenue

Query Bitmap Join Index: indice

```
select c_nation, s_nation, d_year, sum(lo_revenue)
where d_year >= 1992 and d_year <= 1997
and c_region = 'ASIA' and s
```

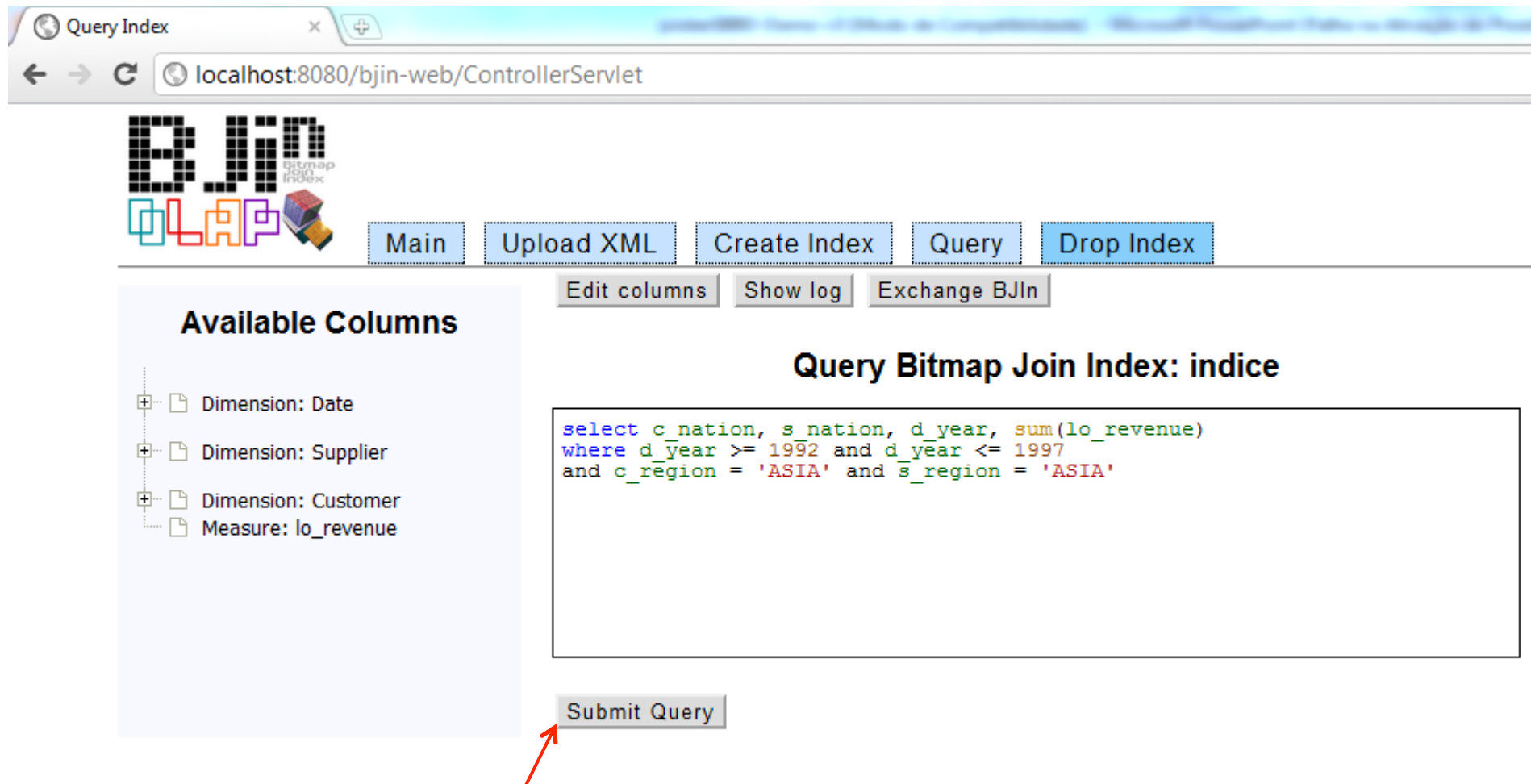
sin
sinh
sqrt
s_region
s_nation
sum
select

Submit Query

Recursos:

- *Highlight*
- *Auto-complete*

Consultando um índice



The screenshot shows a web browser window with the address bar displaying `localhost:8080/bjin-web/ControllerServlet`. The page title is "Query Index". The main navigation menu includes buttons for "Main", "Upload XML", "Create Index", "Query", and "Drop Index". Below the navigation, there are buttons for "Edit columns", "Show log", and "Exchange BJIn".

On the left side, under the heading "Available Columns", there is a list of columns:

- Dimension: Date
- Dimension: Supplier
- Dimension: Customer
- Measure: lo_revenue

In the center, the heading "Query Bitmap Join Index: indice" is displayed above a text area containing the following SQL query:

```
select c_nation, s_nation, d_year, sum(lo_revenue)
where d_year >= 1992 and d_year <= 1997
and c_region = 'ASIA' and s_region = 'ASIA'
```

Below the query text area, there is a "Submit Query" button, which is highlighted with a red arrow.

Cross-table

Query Index

localhost:8080/bjin-web/ControllerServlet

```

where d_year >= 1992 and d_year <= 1997
and c_region = 'ASIA' and s_region = 'ASIA'
    
```

Submit Query

Executed: 1501 ms

Available roll-up: from to level

Subtotals aggregate function:

[drag paging columns here]

Cross-table

sum(lo_revenue)	s_nation	CHINA				Total for CHINA	INDIA		
	d_year	1992	1993	1994	1995		1992	1993	
	c_nation								
	CHINA	2747445915.00	2702587106.00	2750601414.00	1377908871.00	9578543306.00	2483239657.00	2358077443.00	2
	INDIA	2417019508.00	2589678876.00	2592090838.00	1347207152.00	8945996374.00	2414013156.00	2234847128.00	2
	INDONESIA	2822893775.00	2782907485.00	3105282784.00	1497958932.00	10209042976.00	2328132346.00	2527895116.00	2
	JAPAN	2683756133.00	2655692248.00	2668883820.00	1420508759.00	9428840960.00	2321728941.00	2414547321.00	2
	VIETNAM	2641199115.00	2725182113.00	2711353562.00	1324296909.00	9402031699.00	2446150655.00	2360345576.00	2
	TOTAL	13312314446.00	13456047828.00	13828212418.00	6967880623.00	47564455315.00	11993264755.00	11895712584.00	12
	c_nation								

Slice-and-dice

Query Index

localhost:8080/bjin-web/ControllerServlet

- Level: d_year
- Dimension: Supplier
 - Hierarchy: Supplier
 - Level: s_region
 - Level: s_nation
- Dimension: Customer
 - Hierarchy: Customer
 - Level: c_region
 - Level: c_nation
- Measure: lo_revenue

```
where d_year >= 1992 and d_year <= 1997
and c_region = 'ASIA' and s_region = 'ASIA'
```

Submit Query

Executed: 1501 ms

**Roll-up
(de c_nation para c_region)**

Available roll-up: from to level

Subtotals aggregate function:

[drag paging columns here]

sum(lo_revenue)	s_nation	d_year	CHINA			Total for CHINA	TOTAL	s_nation
			1993	1994	1995			
	CHINA		2702587106.00	2750601414.00	1377908871.00	9578543306.00	9578543306.00	
	INDIA		2589678876.00	2592090838.00	1347207152.00	8945996374.00	8945996374.00	
	INDONESIA		2782907485.00	3105282784.00	1497958932.00	10209042976.00	10209042976.00	
	JAPAN		2655692248.00	2668883820.00	1420508759.00	9428840960.00	9428840960.00	
	VIETNAM		2725182113.00	2711353562.00	1324296909.00	9402031699.00	9402031699.00	
	TOTAL		13312314446.00	13456047828.00	13828212418.00	47564455315.00	47564455315.00	

Ascending
 Descending
 Subtotals

- CHINA
- INDIA
- INDONESIA
- JAPAN
- VIETNAM

Slice-and-dice

Roll-up

Query Index

localhost:8080/bjin-web/ControllerServlet

Measure: lo_revenue

Submit Query

Executed: 1161 ms

Available roll-up: from to level

Available drill-down: from to level

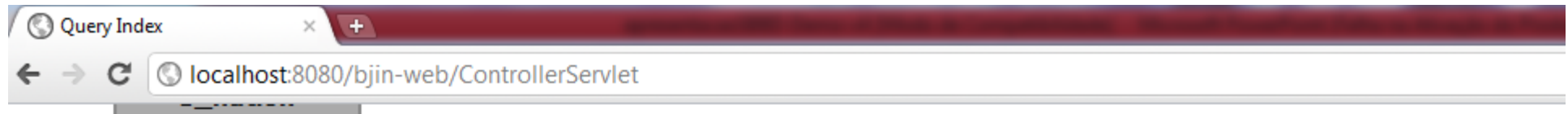
Subtotals aggregate function:

[drag paging columns here]

sum(lo_revenue)	c_region	ASIA				Total for ASIA	TOTAL	c_region
	d_year	1992	1993	1994	1995			d_year
	s_nation							
	CHINA	13312314446.00	13456047828.00	13828212418.00	6967880623.00	47564455315.00	47564455315.00	
	INDIA	11993264755.00	11895712584.00	12298284345.00	5908483969.00	42095745653.00	42095745653.00	
	INDONESIA	11631452377.00	11580305910.00	11880894726.00	5779364326.00	40872017339.00	40872017339.00	
	JAPAN	10594997913.00	10390561546.00	10426211280.00	5351888227.00	36763658966.00	36763658966.00	
	VIETNAM	9607109503.00	10120150957.00	9856927099.00	4870221826.00	34454409385.00	34454409385.00	
	TOTAL	57139138994.00	57442778825.00	58290529868.00	28877838971.00	201750286658.00	201750286658.00	
	s_nation							

Roll-up
(realizado)

Gráficos



Hide chart

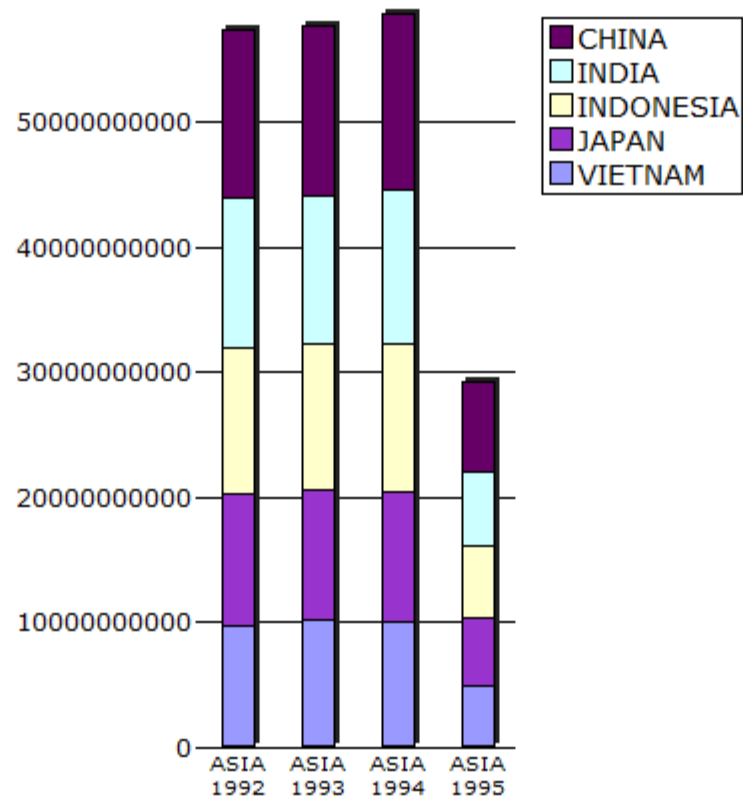


Gráfico da
visualização
atual da tabela

Show column totals chart

Show row totals chart

Pivoting

Query Index

localhost:8080/bjin-web/ControllerServlet

Submit Query

Executed: 1161 ms

Available roll-up: from to level Submit Roll-Up

Available drill-down: from to level Submit Drill-down

Subtotals aggregate function:

[drag paging columns here]

sum(lo_revenue)	c_region	ASIA				Total for ASIA	TOTAL	c_region
	d_year	1992	1993	1994	1995			d_year
CHINA		13312314446.00	13456047828.00	13828212418.00	6967880623.00	47564455315.00	47564455315.00	
INDIA		11993264755.00	11895712584.00	12298284345.00	5908483969.00	42095745653.00	42095745653.00	
INDONESIA		11631452377.00	11580305910.00	11880894726.00	5779364326.00	40872017339.00	40872017339.00	
JAPAN		10594997913.00	10390561546.00	10426211280.00	5351888227.00	36763658966.00	36763658966.00	
VIETNAM		9607109503.00	10120150957.00	9856927099.00	4870221826.00	34454409385.00	34454409385.00	
TOTAL		57139138994.00	57442778825.00	58290529868.00	28877838971.00	201750286658.00	201750286658.00	

Pivoting

Pivoting

Query Index x +

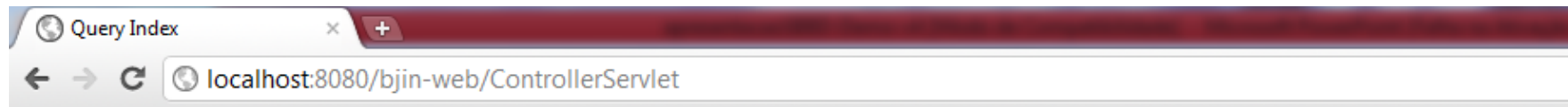
localhost:8080/bjin-web/ControllerServlet

sum(lo_revenue)		c_region	ASIA	TOTAL	c_region
d_year	s_nation				
1992	CHINA		13312314446.00	13312314446.00	
	INDIA		11993264755.00	11993264755.00	
	INDONESIA		11631452377.00	11631452377.00	
	JAPAN		10594997913.00	10594997913.00	
	VIETNAM		9607109503.00	9607109503.00	
Total for 1992			57139138994.00	57139138994.00	
1993	CHINA		13456047828.00	13456047828.00	
	INDIA		11895712584.00	11895712584.00	
	INDONESIA		11580305910.00	11580305910.00	
	JAPAN		10390561546.00	10390561546.00	
	VIETNAM		10120150957.00	10120150957.00	
Total for 1993			57442778825.00	57442778825.00	
1994	CHINA		13828212418.00	13828212418.00	
	INDIA		12298284345.00	12298284345.00	
	INDONESIA		11880894726.00	11880894726.00	
	JAPAN		10426211280.00	10426211280.00	
	VIETNAM		9856927099.00	9856927099.00	
Total for 1994			58290529868.00	58290529868.00	
1995	CHINA		6967880623.00	6967880623.00	
	INDIA		5908483969.00	5908483969.00	
	INDONESIA		5779364326.00	5779364326.00	
	JAPAN		5351888227.00	5351888227.00	
	VIETNAM		4870221826.00	4870221826.00	
Total for 1995			28877838971.00	28877838971.00	
TOTAL			201750286658.00	201750286658.00	
d_year	s_nation				

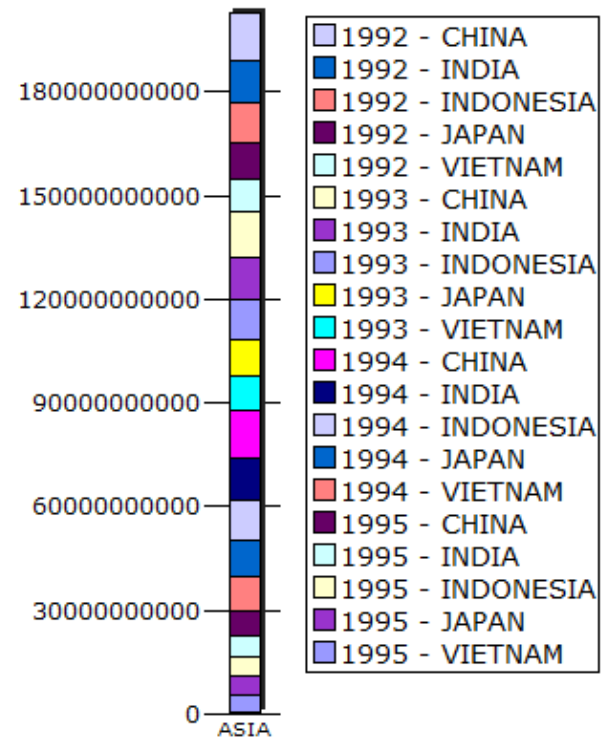
Show chart Show column totals chart Show row totals chart

Pivoting
(realizado)

Gráficos



Hide chart

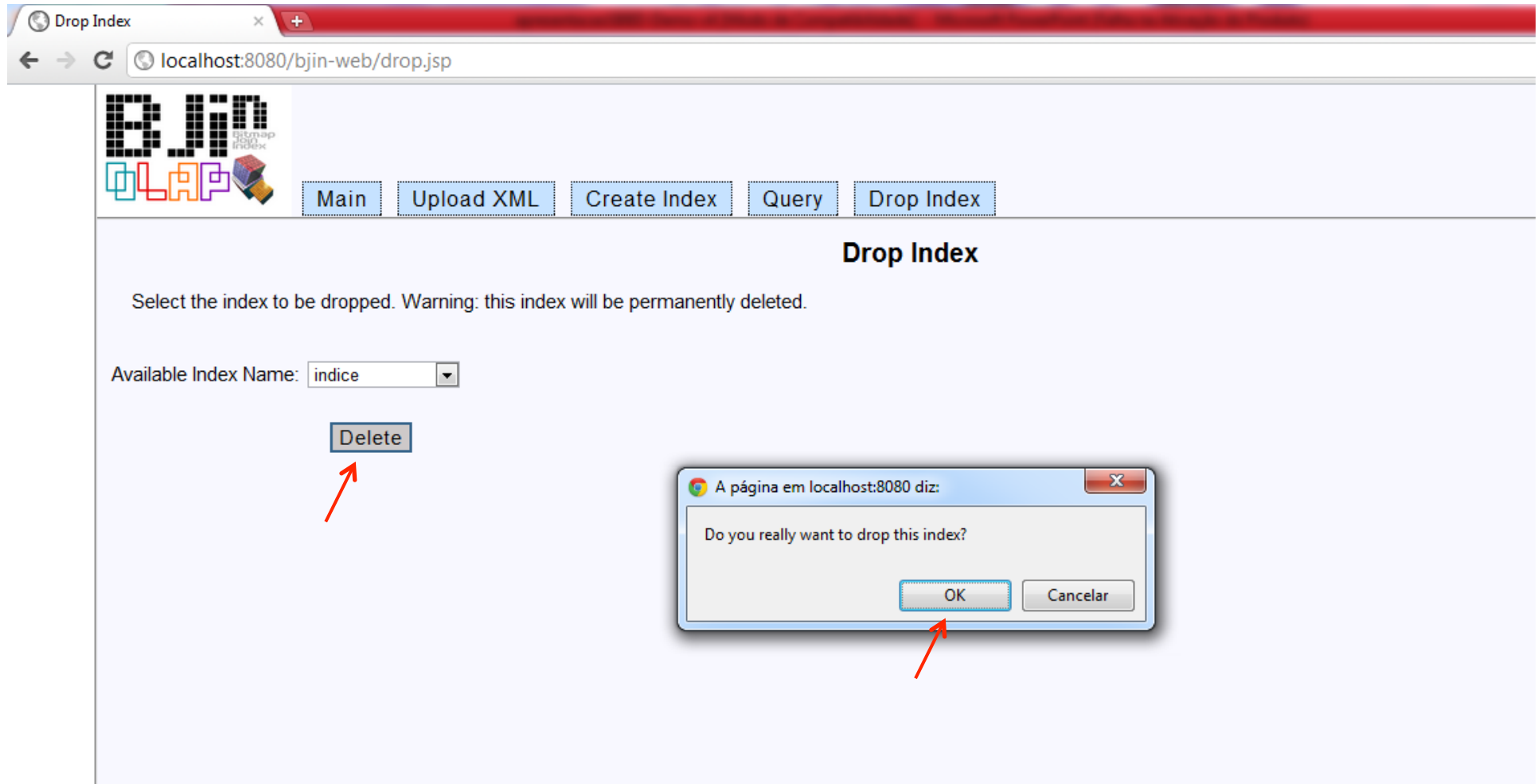


Pivoting não envia nova requisição ao servidor para construir o gráfico.

Show column totals chart

Show row totals chart

Exclusão do índice

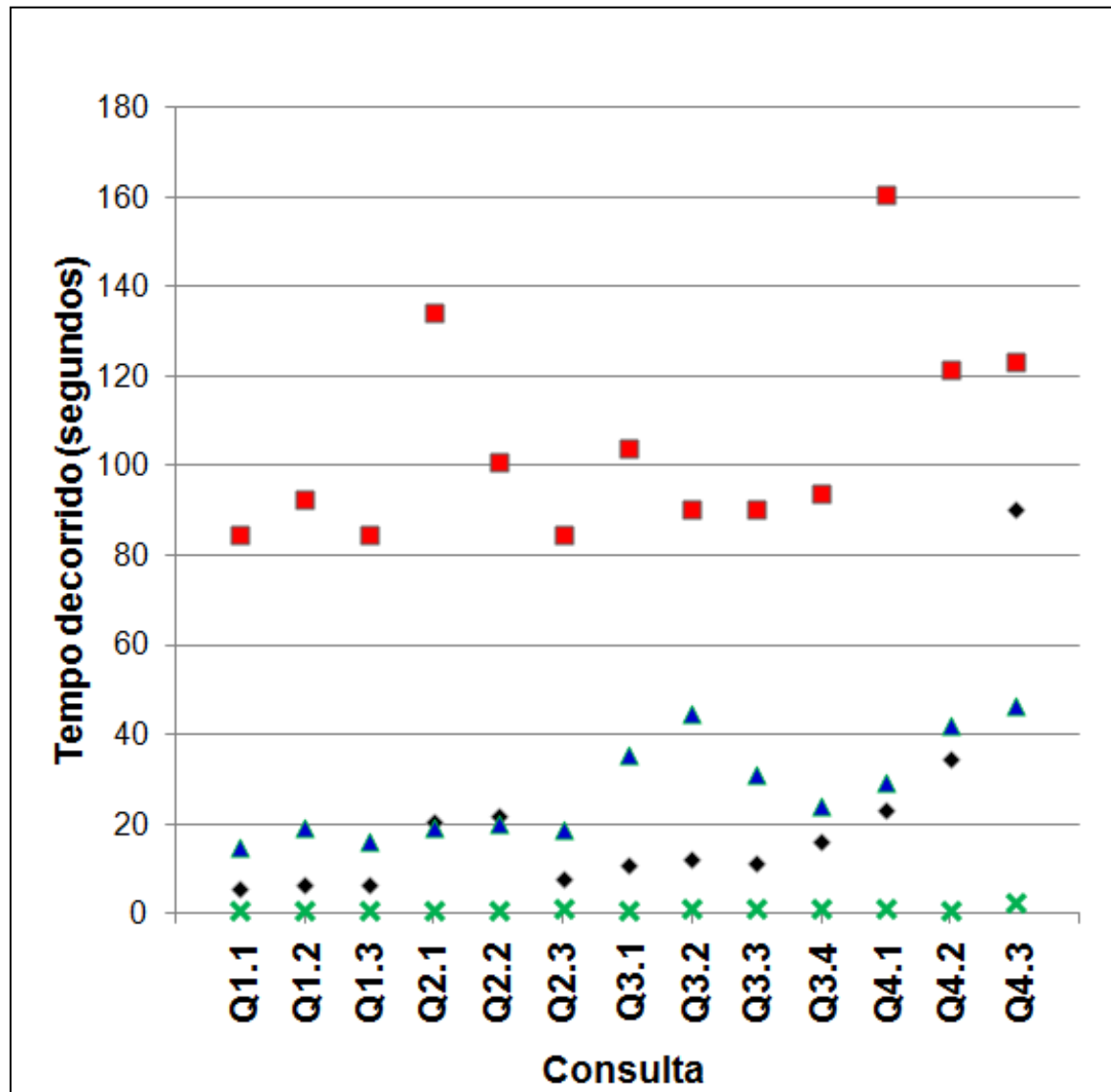


The screenshot shows a web browser window with the address bar displaying `localhost:8080/bjin-web/drop.jsp`. The page title is "Drop Index". The navigation menu includes "Main", "Upload XML", "Create Index", "Query", and "Drop Index". The main content area is titled "Drop Index" and contains the following text: "Select the index to be dropped. Warning: this index will be permanently deleted." Below this text, there is a dropdown menu labeled "Available Index Name:" with the value "indice" selected. A "Delete" button is positioned below the dropdown menu, with a red arrow pointing to it. A confirmation dialog box is overlaid on the page, with the title "A página em localhost:8080 diz:" and the message "Do you really want to drop this index?". The dialog box has "OK" and "Cancelar" buttons, with a red arrow pointing to the "OK" button.

Testes de desempenho

- Validação da ferramenta comparando-a às tecnologias existentes
- Consultas e DW construídos a partir do Star Schema Benchmark
 - 60 milhões de tuplas na tabela de fatos
- Plataforma de hardware e software
 - Processador Athlon™ II X2 2.8 Ghz
 - HD 320 GB SATA 7200 RPM
 - 2 GB de RAM
 - Linux Fedora 14
 - FastBit 1.2.3
 - PostgreSQL 9.0
 - Mondrian OLAP Server 3.2

Resultados



Junção estrela &
Mondrian

Junção estrela &
BJIIn OLAP Tool

Visão materializada &
Mondrian

Visão Materializada &
BJIIn OLAP Tool

Resultados

- Grupos **Q3** e **Q4** do Star Schema Benchmark
- Operações OLAP de *roll-up* e *drill-down*
- Tempo decorrido em segundos para executar consultas consecutivas

	OLAP	VM+Mondrian	SJ+BJIn OLAP	VM+BJIn OLAP	Redução
Q3	Roll-up	43	139	6	83 %
	Drill-down	43	158	5	86 %

	OLAP	VM+Mondrian	SJ+BJIn OLAP	VM+BJIn OLAP	Redução
Q4	Roll-up	223	132	15	93 %
	Drill-down	224	138	16	92 %

Conclusões

- BIIn OLAP Tool é a única ferramenta OLAP baseada no índice bitmap de junção capaz de processar
 - Drill-down
 - Roll-up
 - Slice-and-dice
 - Pivoting
- Facilidade de utilização com recursos visuais apropriados
 - Construção do índice
 - Consultas sobre o índice
- Compatibilidade
 - Sistemas operacionais: Windows e Linux
 - SGBDs: PostgreSQL, IBM DB2[®] e MySQL