

Exploring JoREP 2.0: features and potential uses in the studies on Europeanisation of research activities

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**PRESENTATION AND APPLICATION OF QUERYING
TECHNIQUES TO JoREP 2.0**

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RISIS

Research infrastructure for research
and innovation policy studies



SEVENTH FRAMEWORK
PROGRAMME

Consiglio Nazionale delle Ricerche
IRCrES












ISTITUTO di RICERCA sulla CRESCITA ECONOMICA SOSTENIBILE
RESEARCH INSTITUTE on SUSTAINABLE ECONOMIC GROWTH

JoREP 2.0 and MS Access

- JoREP data are implemented in **MS Access 2013**.
- Access environment:
 - complex data
 - several sets of information from different archives
 - custom views of data.
- You are displaying a **demo version of JoREP database**, created to introduce you for potential future uses of the database.



Table

	BeneficiariesHistory
	BeneficiarySectorsAbbreviations
	Countries
	CountriesDescriptors
	Currencies
	ExchangeRates
	FundingAgenciesList
	ParticipationHistory
	ProgrammeCatalogue
	ProgrammeHistory
	Years



Object in MS access

- A database primary purpose is **to store data**.
- According to the need of the user, MS Access allows to ‘play’ with data through different ‘**objects**’:
 - TABLES -> to ORGANIZE and STORE Data (back-end)
 - FORMS -> to ENTER Data (back-end)
 - **QUERIES -> to VIEW and ANALYZE Data (front-end)**
- As a first step, we can define queries as “objects” (similar in structure to the tables) providing **flexible** ways for any database **manipulation operation** (latin word: *quaerere*).



Why creating Access query?

- Queries enable user to **extract data**.
- You can create a query when you need **ONLY** a **specific portion** of the data form tables (or existing queries).
 - For example, you may **only need to see joint R&D programmes which France participates to**. The response would be to display only the records whose state field matches with French participation.
- Multiple tables or queries can be used.
- Restrictions can be used
 - e.g. Comparison operators



Creating a query in JoREP 2.0

- By using the **Query Wizard**, you can create only very simple queries (*quick-and-dirty way*).
- We'll create all our queries using the **Design View**. Once designed, the results of a query can be displayed in Datasheet View
- What you can do with Access queries in JoREP
 - Choose tables (e.g. *ProgrammeCatalogue, ParticipationHistory*)
 - Choose fields of your interest (e.g. *Countries, NABS, Amount*)
 - Provide criteria (e.g. *only particular NABS*)
 - Sort records (e.g. *by country*)
 - Perform calculations (e.g. *sum amounts of investments*)...



The Query Design view window

Field: This is where field names are entered or added.

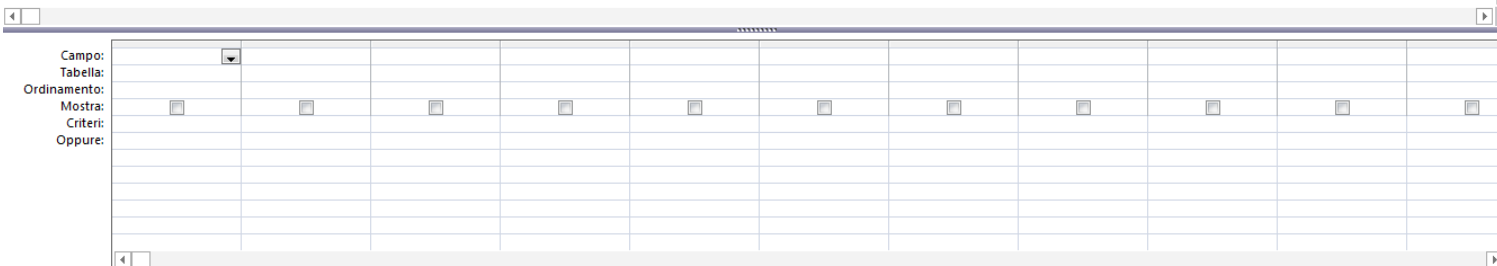
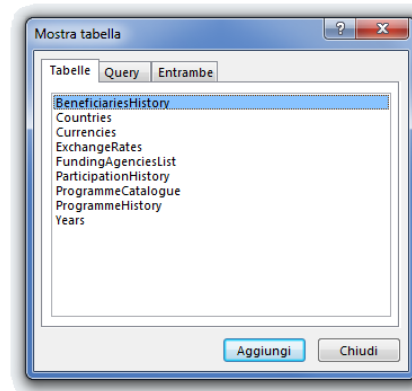
Table: This row shows the table the field is from. This is useful in queries with multiple tables.

Sort: This row enables sorting instructions for the query.

Show: This row determines whether to display the field in the returned recordset.

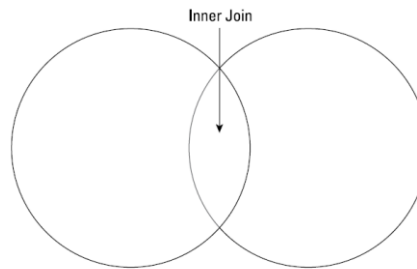
Criteria: This row consists of the criteria that filter the returned records.

Or: This row is the first of a number of rows to which you can add multiple query criteria.



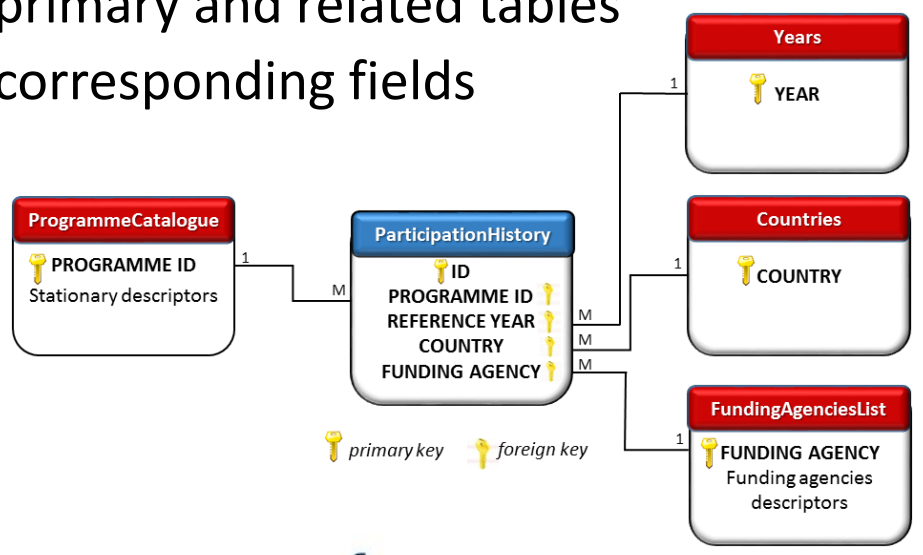
Creating Queries using Multiple Tables

- Access makes easy to **join two or more tables**.
- The first step is adding the tables to your query, using the **Show Table window**. If you're creating a new query in Design view, the Show Table window appears right away!
- Once you have your **related tables** in the query design window, you're ready to choose the fields you want. You can **pick fields from multiple tables**.
- In JoREP all the 1:M relationship are built with INNER JOINS by default.




Before creating a query

- **Review each table!**
 - Identify necessary information such as data type (short text; numeric), and so on.
 - Possibly figure it out manually
- **Review relationships!**
 - Identify primary and related tables
 - Identify corresponding fields




More about a query

- Do not include any **unnecessary tables or queries** in Design View of the query (you will probably have to deal with unexpected problems!)
- Always use a **primary table** 

ProgrammeCatalogue
 PROGRAMME ID

FundingAgenciesList
 FUNDING AGENCY

Countries
 COUNTRY

Years
 YEAR

- Restrictions **MUST** be used.
- **You can use... other queries in order to create a new query**



Focus on the select queries

- A **select query** is the most common type of query.
- It retrieves data from one or more tables and displays the results in a datasheet
- You can choose **what 'fields' to view, sort records by one or more fields; limit which records you see (classic selection criteria); combine data from multiple tables;** and so on...
- You can also use a select query to group records and calculate sums, counts, averages, and other types of totals.



A last advice before starting

- The secret to a good query is getting **the information you want, and nothing more.**
- In order to tell Access what records it should get (and which ones it should ignore), you need a **filter expression!**
- A little of data syntax
 - **Fields of tables []**: square brackets
 - **Strings “ ”**: enclosed in double quotes
 - **Date #** : hashtag
 - **Links field and tables !** : exclamation point



Types of operators

- You can use the **relational operators**:

- < less than

- <= less than or equal to

- = equal to

- <> Not equal to

- > Greater

- >= Greater than or equal to

- **Logical operators**:

- And, Or, Not

- The **logic functions**:

- IIF

- **Other functions**:

- IsNull; Like

There are seven basic mathematical operators:

+	Addition
-	Subtraction
*	Multiplication
/	Division
\	Integer division
^	Exponentiation



Creating Queries using Multiple Tables (step-by-step)

1. *Choose Create → Queries → Query Design*
2. *Select the table that has the data you want, and then click Add (or just double-click the table)*
3. *Select the fields you want to include in your query.*
4. *Arrange the fields from left to right in the order you want them to appear in the query results.*
5. *Choose a sort order*
6. *Set your filtering criteria*
7. *Choose Query Tools | Design → Results → Run*
8. *Save the query*



Stating query conditions

And logical operator;
conditions entered in
the same row

Field:	StartDate	EndDate	Openings	EmployerName	State/Prov	ContactFirstName	Contact
Table:	Position	Position	Position	Employer	Employer	Employer	Employer
Sort:							
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	#7/1/2003#				"PE"		
or:							

And conditions must be
specified on the same line.

Or conditions must be specified on different lines.

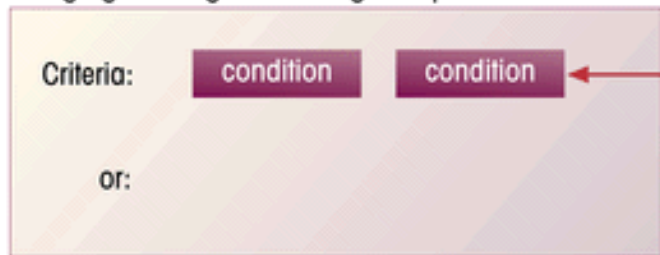
Or logical operator;
conditions entered in
different rows

Field:	EmployerName	City	PositionTitle	Hours/Week	Experience		
Table:	Employer	Employer	Position	Position	Position		
Sort:							
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				<30	Yes		
or:							



AND and OR conditions

design grid using the And logical operator

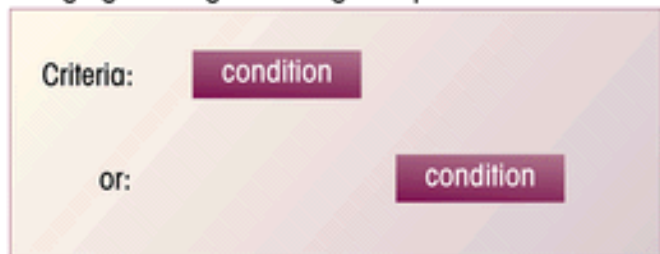


conditions are placed in the same row



The And condition.

design grid using the Or logical operator



conditions are placed in different rows

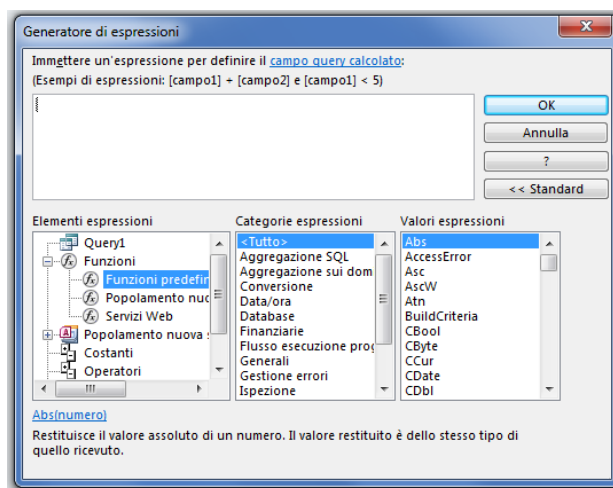


The Or condition.



Query 'functions'

- A function is a built-in algorithm that takes some data that you supply, performs a calculation, and then returns a result.
- The difference between functions and the mathematical operators is the fact that **functions can perform far more complex operations.**
- Functions: name followed by () / Use of "Build" function



Ready?

Now we can start with...
...some **research topics**



RESEARCH TOPIC / A

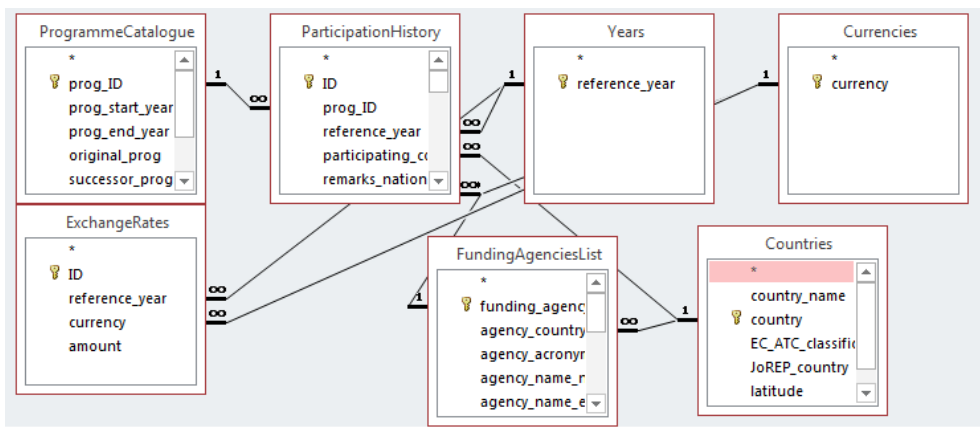
Joint programming landscape evolution

- How relevant are joint programming in the European Research Area? Did investment in joint programmes change over the years?
- What is the importance of European and National funding in joint programming?
- Which are the main authorities behind their establishment?



Generating query A.1

- I know that JoREP contains data on national investments in Joint R&D programmes from 32 sample countries. I need to know how much each country invested for each year (from 2000 on) along the life of each programme. I would like to know the data in Euro.

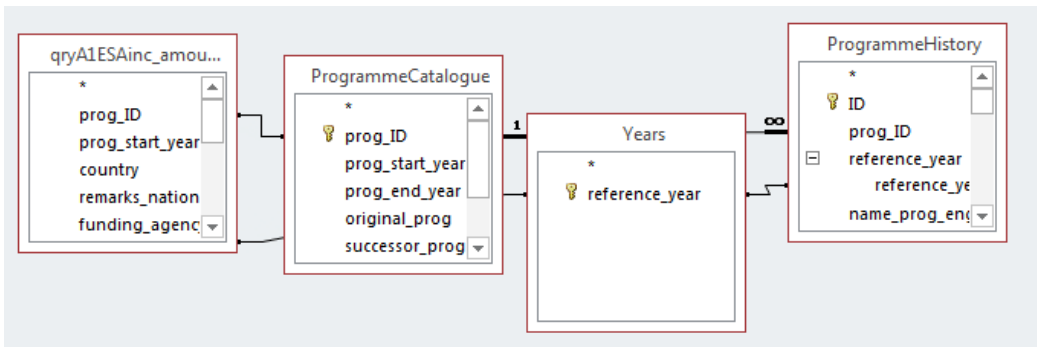


Campo:	prog_ID	prog_start_year	country	funding_agency_ID	reference_year	amount	amount_euro: [ParticipationHistory].[Amount]*[ExchangeRates].[Amount]
Tabella:	ProgrammeCatalogue	ProgrammeCatalogue	Countries	FundingAgenciesList	Years	ParticipationHistory	
Ordinamento:							
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteri:							
Oppure:							



Generating query A.2

- Well, now I want to know the total amount invested for all the programmes. I think data could be biased by the presence of ESA programme (with/without ESA).



ProgrammeID
ProgrammeCatalogue
Raggruppamento
<input checked="" type="checkbox"/>
<> "PEU041"

Campo:	prog_ID	name_prog_eng	establishing_authority	amount_euro
Tabella:	ProgrammeCatalogue	ProgrammeHistory	ProgrammeCatalogue	qryA1ESAinc_amount
Formula:	Raggruppamento	Raggruppamento	Raggruppamento	Somma
Ordinamento:				
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteri:				
Oppure:				



Generating query A.3

- I guess that funding volume increases over years. Is it true?

qryA1ESAinc_amount_eur...

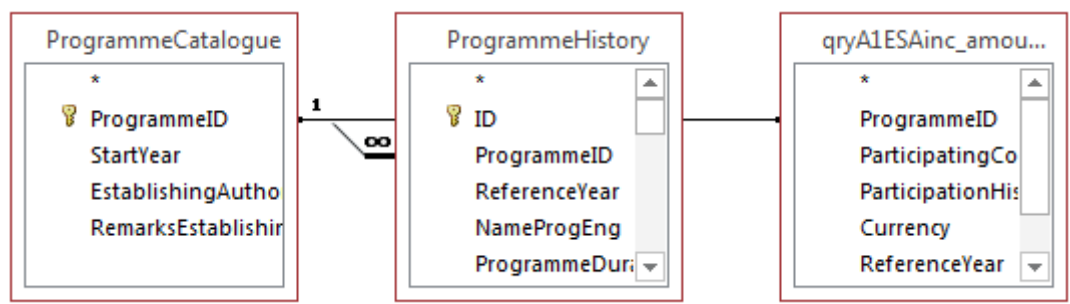
*
ProgrammeID
ParticipatingCountry
ParticipationHistory.Amo
Currency
ReferenceYear
ExchangeRates.Amount
amount_euro

ReferenceYear	amount_euro
qryA1ESAinc_amount	qryA1ESAinc_amount
Raggruppamento	Somma
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Generating Query A.4

- It would be interesting to know investments in joint R&D Programmes in a specific year only...



Campo:	prog_ID	name_prog_eng	amount_euro	reference_year.Value
Tabella:	ProgrammeCatalogue	ProgrammeHistory	qryA1ESAinc_amount	ProgrammeHistory
Formula:	Raggruppamento	Raggruppamento	Somma	Dove
Ordinamento:				
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteri:				2009
Oppure:				



Generating Query A.5

- What is the main authority establishing joint R&D programmes? What is the distribution of amount of investments by authority?

qryA2ESAexc_sub1_amoun...

*
ProgrammeID
NameProgEng
EstablishingAuthority
SommaDiamount_euro

EstablishingAuthc	ProgrammeID	SommaDiamount_eur
qryA2ESAexc_sub1_an	qryA2ESAexc_sub1_an	qryA2ESAexc_sub1_an
Raggruppamento	Conteggio	Somma
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



RESEARCH TOPIC / B

Patterns of National participations in joint programming

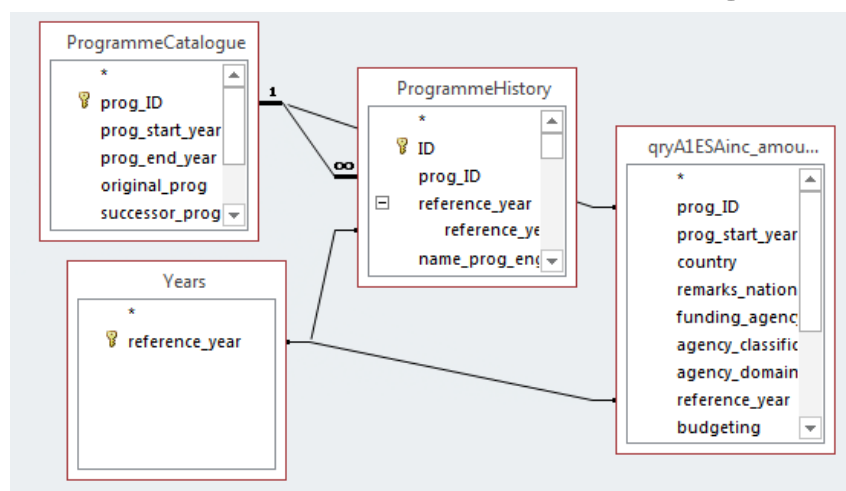
- Are there any differences by country in the participation to joint programming?
- Can we identify different patterns of integration?
- How do countries participate to the same programmes?

...more on research topic D...



Generating Query B.1

- I would like to know how much each country invested for each joint R&D programme contained in JoREP. I want to match this information with data on categories of the programme.



Campo:	prog_ID	country	amount_euro	ERA_category
Tabella:	ProgrammeCatalogue	qryA1ESAinc_amount	qryA1ESAinc_amount	ProgrammeHistory
Formula:	Raggruppamento	Raggruppamento	Somma	Raggruppamento
Ordinamento:				
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteri:				
Oppure:				



Generating Query B.1.1

- For each country, I am interested in counting all the participation to the programmes, how did it invest, the minimum and maximum for the expense and the average of investment

```

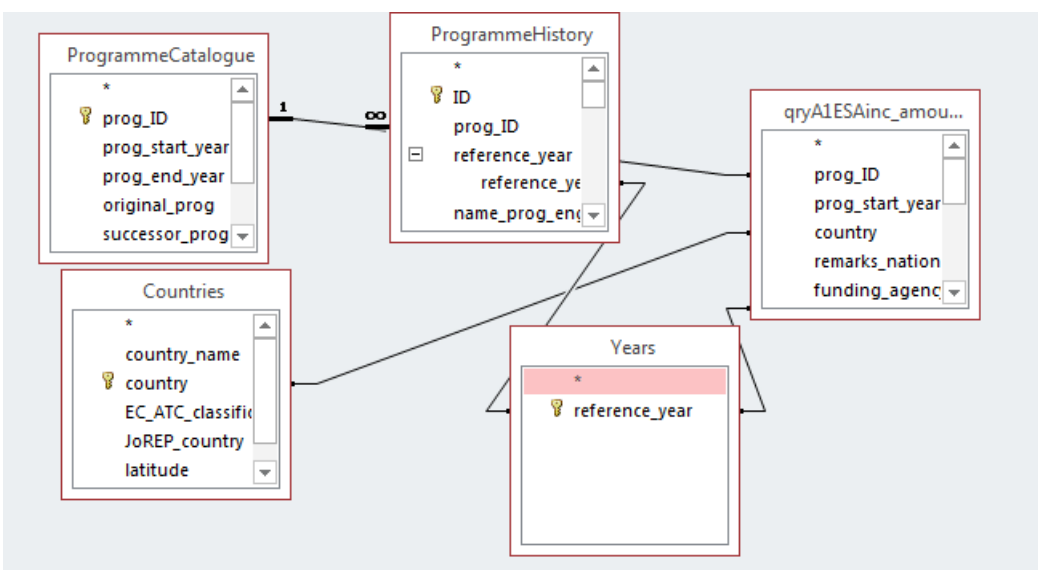
qryB1_national_parti...
*
ProgrammeID
ParticipatingCount
SommaDiamount_e
ERACategory
    
```

Campo:	qryA1ESAinc_amount	ProgrammeCatalogue	SommaDiamount_eur	SommaDiamount_eur	SommaDiamount_eur	SommaDiamount_eur
Tabella:	qryB1_national_parti	qryB1_national_parti	qryB1_national_parti	qryB1_national_parti	qryB1_national_parti	qryB1_national_parti
Formula:	Raggruppamento	Conteggio	Somma	Min	Max	Media
Ordinamento:						
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteri:	<> European level					
Oppure:						



Generating Query B.2

- I would like to know how much it was invested in the different typologies of joint R&D programmes.



Campo:	country	ERA_category	prog_type	funding_model	amount_euro
Tabella:	qryA1ESAinc_amount	ProgrammeHistory	ProgrammeHistory	ProgrammeHistory	qryA1ESAinc_amount
Formula:	Raggruppamento	Raggruppamento	Raggruppamento	Raggruppamento	Somma
Ordinamento:					
Mostra:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteri:					
Oppure:					



RESEARCH TOPIC / C

Matrix for **spatial analysis** with JoREP

We need:

- Countries and their descriptors
- Programme-level data (e.g. NABS, type of instrument...)
- Funding agencies data (e.g. agency domain)
 - Country descriptors

THREE STEPS



RESEARCH TOPIC / D

Matrix for **network analysis** with JoREP

We need:

- Structure of the networks
- Programme-level data (e.g. NABS, type of instrument...)
- Funding agencies data (e.g. agency domain)
 - Country descriptors

FOUR STEPS



Wrap up

- JoREP 2.0 queries returns dynamic set of records not stored within the dataset unless you have directed Access to build a record from those records.
- When you save a query, only the structure of the query is saved, not the returned records.
- Through creating a query you can sort data, set criteria to limit the results, using operators and expressions.

