



**Session:**

# Digital processing of data from field surveys

V1

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# Content

## First steps before processing the names collected

- Structure for storing the data, maintaining records
- Feature categories/classification

## Demonstration of the processing of names collected

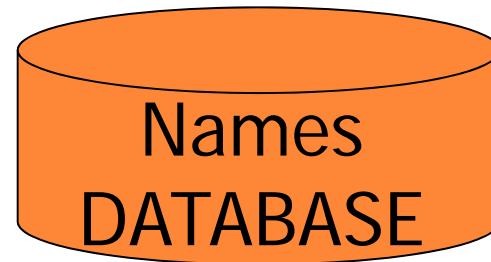
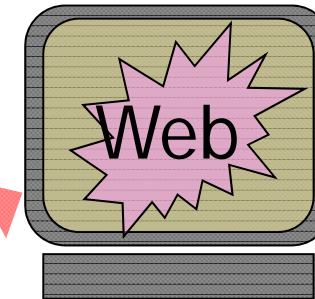
- Spreadsheet or Database?
- Create main tables and enter names into a database
- Database queries and reports (e.g. gazetteers as printouts)



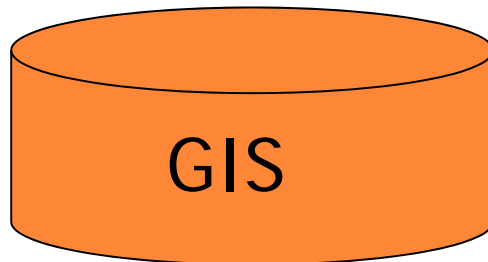
# What are the purposes of a DB?



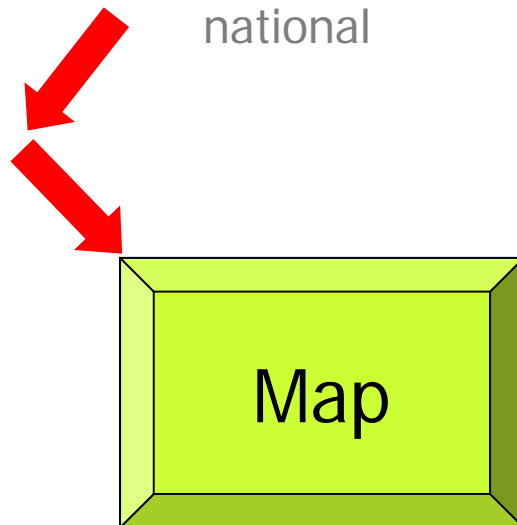
Gazetteer  
(printed)



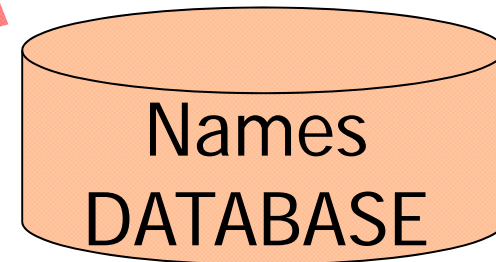
national



GIS



Map



Names  
DATABASE

international



# Structure for storing the data, maintaining the records



1. Gathering of names information

2. Authorizing toponyms

3. Storing the data, maintaining the records

paper:	Gazetteer
digital:	Text file, Spreadsheet, Database



## Structure: Tables !!

Columns:  
attribute information to the name

Rows:  
One for  
each name

Name	Feature Type	Coordinates	.....
Name1			
Name2			
Name3			
.....			



## Structure: Tables !!

Columns:  
attribute information to the name

Rows:  
One for  
each name

Name	Feature Type	Coordinates	.....
Oran	administr. unit	34.66	-0.5
Oued el Oua'am	stream	34.78	-1.63
Djebel el Ouachba	mountain	34.69	2.9
Ouachouache	Populated place	35.79	7.71



## Structure: Tables !!

Columns:  
attribute information to the name

Absolutely necessary!

Rows:  
One for  
each name

Field name	Data type	Description
Geographical Name	Text	the name
Feature Type	Text	e.g. River, Mountain, Populated Place. The types should be chosen from a standardized list, if exists.
Coordinates, e.g.:		
Longitude	Number	Geographical Coordinates
Latitude	Number	Geographical Coordinates Instead of Geographical Coordinates, other systems may be used, for instance UTM with X and Y coordinates.



## Structure: Tables !!

Rows:

One for  
each name

recommended

### Field name

FeatureID  
(for databases)

Variant Name  
Administrative Unit

Map Sheet

Description

Source

Date

Status

Columns:

attribute information to the name

Data type	Description
Integer	A unique identifier assigned to the name. This ID will be used to link the name with other database tables.
Text	Other names assigned to the feature, if any
Text	Name or Code of the Administrative Unit where the name is situated in.
Text	Reference to a map sheet in a topographic map series. The data type may be Integer if the sheet name contains only numbers no letters.
Text	Comments, e.g. on the history of the name, and verbal statements on the extension of the feature.
Text	Source of the name. e.g. captured in the field by interview
Date	Date of the entry to the Database. Other option: date of approval by the Board.
Text	Comment, e.g. name is approved or not approved by the Board.





# Structure for storing the data, maintaining the records

## INSPIRE GN schema: elements

**mandatory**

- name(s) (text, spelling)
- geometry
- feature type
- unique identifier

**‘voidable’**

- language {three letter codes from ISO 639-3 or -5}
- nameStatus {official, standardised, historical, other}
- link to relatedSpatialObject
- script {four letters codes defined in ISO 15924}
- nativeness {endonym, exonym}
- transliterationScheme
- grammatical gender {masc., fem., neuter, common}
- grammatical number {singular, plural, dual}
- pronunciation
- sourceOfName
- typeLocal
- lifeCycleInfo (begin/end of the object in the source DB)
- ...



## CODE

This column contains a specific code of maximally four letters which provides a further specification of the nature of the particular feature. It occasionally proved difficult to draw a sharp distinction between the names of polders and area names. The category 'polder' therefore includes all those names in which the word 'polder' occurs. In addition, this category also includes the names of drained lakes which are clearly visible as a landscape unit on the map, such as Schermer, Flevoland, etc.  
Where no recognizable feature can be discerned from the topography, the name is coded as an area or local name.

The explanation of the 40 codes used is as follows:

ADMD	administrative division
AF	airfield, airport
AN	area name, local name
AQDT	aqueduct
BLDG	building, group of buildings
BRDG	bridge, viaduct
CEM	cemetery
CHAN	channel, fairway
CNAN	canal, waterway, ditch
DAM	dam, groyne, pier
DIKE	dike, embankment
DIST	residential district
FORT	fort, entrenchment
FRST	forest
HBR	harbour
HILL	hill, dune, mountain
HTH	(former) heathland
IND	industrial estate
INL	inlet, estuary
IS	island
LAKE	lake, pool, pond
LH	lighthouse
LOCK	sluice, lock
MISC	miscellaneous landmarks e.g. beacon, belvedere, dock, decoy, burial mound, light,

## Gazetteer of The Netherlands

### - Feature codes

... is it a river,  
a mountain, a  
populated place, etc?

NAME OF FEATURE	CODE	LONGITUDE	LATITUDE	UTM-REF.	ADM. CODE	SHEET +ED.	REMARKS
Enning . . . . .	BLDG	06 51 53	51 54 55	32U LC53155385	GE	410-4	
Ennipwetering . . . . .	CNAN	04 52 40	52 10 11	31U FT28408170	U	310-4	
Ens . . . . .	POPL	05 49 41	52 38 14	31U FU91353580	F1	21W-4	
<b>ENSCHEDÉ . . . . .</b>	<b>POPL</b>	<b>06 53 48</b>	<b>52 13 14</b>	<b>32U LC56308775</b>	<b>0</b>	<b>340-4</b>	<b>35</b>
Enschotsche Akkers . . . . .	AN	05 08 10	51 34 15	31U FT48001555	NB	500-4	
Ensertoicht . . . . .	CNAN	05 49 54	52 37 45	31U FU91653490	F1	21W-4	
Enservaart . . . . .	CNAN	05 50 18	52 40 36	31U FU91854020	F1	21W-4	
Ens Gert . . . . .	BLDG	05 53 00	52 47 33	31U FU94405320	0	16W-4	



⑩ Feature-Code (mnemotechnical) \*)

Mnemotechnical Abbreviation	Feature-Code	Meaning
AD	0924	autobahn triangle
AF	5510	airport, aerodrome
AK	5128	autobahn crossing
AN	0641	landscape (general)
AST	5127	autobahn approach, autobahn exit
BAD	2840	spa, health resort, seaside resort
BANK	8046	sandbank, tidal flat, dune
BAR	1114	border crossing point
CNAL	8200	canal
CRRD	0926	important federal road crossing
GEM	0612	rural community
GEMT	0613	part of city or town, section of commune
HBR	5610	sea or inland port
HPL	0675	capital of a <i>Land</i>
HPR	0676	seat of Regierungspräsident
HPS	0674	capital of the Federal Republic of Germany
IS	0644	island/archipelago
JUNC	0925	main traffic junction (RSTA + AF**) + AST and/or AD, AK, CRRD)
KRS	0677	seat of district administration
LAKE	8610	lake (natural)
MAR	0692	small market town or townlet
MT	0931	elevation (mountain, hill)
MTS	0642	mountain range, hilly country
RES	8620	reservoir, dam
RSTA	5460	railway station, halt
SEA	8641	sea, part of sea
STA	0611	urban commune
STRM	8100	river, stream, brook
VBG	0694	central place (seat of a Samt- or Verbandsgemeinde) (group of neighbouring communes)

**Gazetteer**

**Federal Republic of  
Germany**

**- Feature codes**

# Feature categories/classification

## Feature types provided

### EGN Feature classification

→ 8 classes and 27 sub-classes

- (1) Countries, administrative units and other areas,
- (2) Populated Places,
- (3) Non-residential structures and buildings,
- (4) Transport and telecommunication features,
- (5) Terrain features,
- (6) Hydrographic features,
- (7) Conservation areas,
- (8) Miscellaneous

→ essentially for the purpose of query-filtering

(defined by EGN Reference Group)

Code	Feature Type	Short Definition	Feature Type Examples	
1	<b>COUNTRIES, ADMINISTRATIVE UNITS AND OTHER AREAS</b>	Countries, territorial units of a country for administrative purposes and other man-made areas		
	1.1	Country	Country of Europe	
	1.2	Administrative units	Territorial units of every country for statistics and administrative purposes	
			<i>Including:</i> Nomenclature of Territorial Units for Statistics in EU (NUTS 1, 2 and 3)	länder (Germany) autonomous region (Spain) province
Local Administrative Units (LAU 1 and 2)			municipality	
	Other administrative units			
1.3	Other non-administrative units	Other type of man-made areas like economic, cultural, linguistic or tourist areas		
2	<b>POPULATED PLACES</b>	Buildings for housing of any category like cities, towns, villages, etc.		
	2.1	Administrative capitals	Populated places with capital status	
			<i>Including:</i> Administrative capitals of NUTS 1, 2 and 3	capital of country, autonomous region (Spain), province
			Administrative capitals of LAU 1 and 2	capital of municipality
			Other administrative capitals	
2.2	Other populated places	Populated places without administrative status		
		<i>Including:</i> Cities, towns, villages, hamlets...	city, town, village, hamlet	
		Parts of them	neighborhood	



# Feature categories/classification

## Algeria - Feature codes?



### Geographical Names



#### Aïn Safra: Algeria

SOURCE: National Geospatial-Intelligence Agency, Bethesda, MD, USA

#### Aïn Safra

- Map
- Full Name
- Primary Country Code
- First-order administrative division code
- Region Font Code
- Unique Feature Identifier
- Unique Name Identifier
- Latitude in decimal degrees
- Longitude in decimal degrees
- Latitude in degrees, minutes, and seconds
- Longitude in degrees, minutes, and seconds
- Military Grid Reference System coordinates
- Joint Operations Graphic reference
- Feature Classification
- Feature Designation Code
- Populated Place Classification
- Second-order administrative division code
- Population Figures
- Elevations
- Secondary Country Code
- Name Type
- Language Code
- Substitute for full name
- Descriptive part of the full name
- Sort name
- Full Name with QWERTY characters
- Modify Date
- Definitions

This page presents the geographical name data for Aïn Safra in Algeria, as supplied by the US military intelligence in electronic format, including the geographic coordinates and place name in various forms, latin, roman and native characters, and its location in its respective country's administrative division.

**Full Name** (see definition): Aïn Safra

**Primary Country Code** (see definition): AG (Algeria)

**First-order administrative division code** (see definition): 00 (Algeria (general) )

**Region Font Code** (see definition): 1 (Americas/Western Europe)

**Unique Feature Identifier** (see definition): 249615

**Unique Name Identifier** (see definition): 313607

**Latitude in decimal degrees** (see definition): 36.424722

**Longitude in decimal degrees** (see definition): 8.371389

**Latitude in degrees, minutes, and seconds** (see definition): 36° 25' 29" N

**Longitude in degrees, minutes, and seconds** (see definition): 8° 22' 17" E



## Geographical

Like

Tweet

- Geographical Names INDEX
- Feedback

This page presents the geographical name in electronic format, including the geographical characters, and its location in its respective

**Full Name** (see definition): Aïn Safra

**Primary Country Code** (see definition): AG

**First-order administrative division code**

**Region Font Code** (see definition): 1 (Americas/Western Europe)

**Unique Feature Identifier** (see definition): 2

**Unique Name Identifier** (see definition): 31

**Latitude in decimal degrees** (see definition): 36.15

**Longitude in decimal degrees** (see definition): 7.09

**Latitude in degrees, minutes, and seconds**

**Longitude in degrees, minutes, and seconds**

## Definitions

SOURCE: www.nga.mil

### GIS Compatible Output Format

Field Name	Field Description	Field Type	Default Selection
RC	Region Font Code. A code that determines the character mapping used in the SHORT_FORM, Generic, and Full_Name fields (see Character Set Conversion Table [Char_Sets_20060703.pdf]).  1 = Americas/Western Europe; 2 = Eastern Europe; 3 = Africa/Middle East; 4 = Russia/ Central Asia; 5 = Asia/Pacific; 6 = Vietnam.	number	Y
UFI	Unique Feature Identifier. A number which uniquely identifies a Geoname feature.	number	Y
UNI	Unique Name Identifier. A number which uniquely identifies a name.	number	Y
LAT	Latitude of the Geoname feature in $\pm$ decimal degrees; DD; ( $\pm$ dd.dd...): no sign (+) = North; 05°03'09"E » 5.0525  negative sign (-) = South; 05°03'09"S » -5.0525	number	Y
LONG	Longitude of the feature in $\pm$ decimal degrees; DD; ( $\pm$ dd.dd...): no sign (+) = East;  negative sign (-) = West.	number	Y
DMS_LAT	Latitude of the Geoname feature in $\pm$ degrees, minutes, and seconds; DMS; ( $\pm$ ddmmss): no sign (+) = North;  negative sign (-) = South.	number	Y
DMS_LONG	Longitude of the Geoname feature in $\pm$ degrees, minutes, and seconds; DMS; ( $\pm$ dddmmss) : no sign (+) = East;	number	Y

# Content

## First steps before processing the names collected

- Structure for storing the data, maintaining records
- Feature categories/classification

## Demonstration of the processing of names collected

- Spreadsheet or Database?
- Create main tables and enter names into a database
- Database queries and reports (e.g. gazetteers as printouts)



## 1) Spreadsheet (software: e.g. Microsoft Excel)

*advantage:*

extended processing capabilities

*disadvantage:*

digital processing limited to operations within the spreadsheet

Name	Feature Designation Name	Latitude	Longitude
Oued el Oua'am	Stream	34,78	-1,63
Ouachouache	Populated Place	35,79	7,71
Oran	Administrative Unit	35,66	-0,5
Djebel el Ouachba	Mountain	34,69	2,9

[demo3.xls](#)





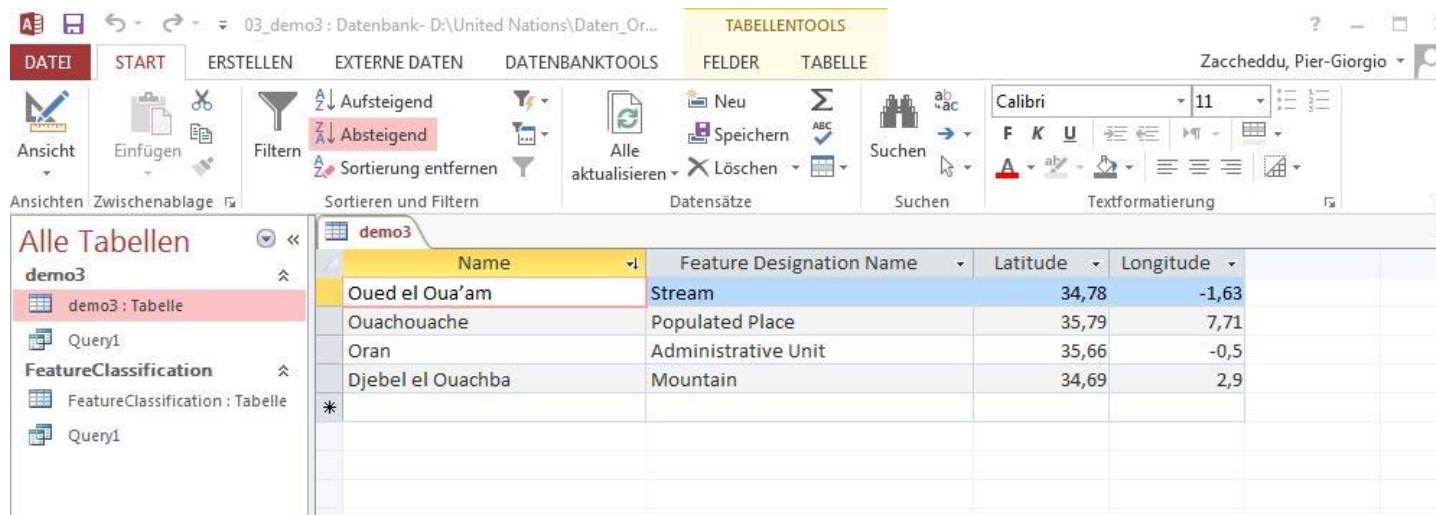
## 2) Database (software: e.g. Microsoft Access)

### *advantages:*

data can be connected with other databases,  
complex processing capabilities

### *disadvantages:*

some programming and/or user skills required



The screenshot shows the Microsoft Access interface with a table named 'demo3' open. The table has the following data:

Name	Feature Designation Name	Latitude	Longitude
Oued el Oua'am	Stream	34,78	-1,63
Ouachouache	Populated Place	35,79	7,71
Oran	Administrative Unit	35,66	-0,5
Djebel el Ouachba	Mountain	34,69	2,9



# Create main tables and enter names into a database with MS Access



Name	Feature Designation Name	Latitude	Longitude
Oued el Ou'a'am	Stream	34,78	-1,63
Ouachouache	Populated Place	35,79	7,71
Oran	Administrative Unit	35,66	-0,5
Djebel el Ouachba	Mountain	34,69	2,9
*			

**names table**  
Datasheet  
view and  
design view



# Create main tables and enter names into a database with MS Access



The screenshot shows two MS Access windows. The left window displays the 'demo3' table in design view with fields: Name, Oued el Ou'a'am, Ouachouache, Oran, Djebel el Ouachba, and \*. The right window displays the 'FeatureClassification' table in design view with fields: Name, Feature Designation Name, Latitude, and Longitude. A 'TABELLENTWURF' (Table Design) window is overlaid on the right, listing field names and their data types.

Field Name	Data Type
RecordID	Index
UID	Number (long integer)
Name	Text (50 char.)
Latitude	Number (double)
Longitude	Number (double)
FeatureCode	Text (50 char.)
AdminUnit	Text (50 char.)
Language	Text (50 char.)
Description	Text (255 char.)
VariantName	Text (50 char.)
MapSheet	Number (long integer)
Source	Text (255 char.)
Status	Text (50 char.)
Pronunciation	OLE-Object
Location information	OLE-Object

names table  
Datasheet  
view and  
design view



# Create main tables and enter names into a database with MS Access



03\_demo3 : Datenbank- D:\United Nations\Daten\_Or... TABELLENTOOLS

DATEI START ERSTELLEN EXTERNE DATEN DATENBANKTOOLS FELDER TABELLE Zaccheddu, Pier-Giorgio

Ansicht Einfügen Filtern Sortieren und Filtern Datensätze Suchen Textformatierung

Tabellen demo3 FeatureClassification

ID	FeatureDesignation	FeatureCod	Zum Hinzufügen klicken
1	Populated Place	PPL	
2	Stream	STM	
3	Mountain	MT	
4	Administrative Unit	ADM	
*	(Neu)		

## Feature classification table

Datasheet  
view and  
design view



# Create main tables and enter names into a database with MS Access



The screenshot shows the Microsoft Access interface with the 'FeatureClassification' table in design view. The table has three fields: 'ID' (AutoWert), 'FeatureDesignation' (Kurzer Text), and 'FeatureCode' (Kurzer Text). The 'ID' field is marked as the primary key. The 'Allgemein' tab is selected in the 'Feldereigenschaften' pane, showing properties like 'Feldgröße' (Long Integer), 'Neue Werte' (Inkrement), 'Format', 'Beschriftung', 'Indiziert' (Ja (Ohne Duplikate)), and 'Textausrichtung' (Standard). A note at the bottom right states: 'Ein Feldname kann bis zu 64 Zeichen lang sein, einschließlich Leerzeichen. Drücken Sie F1, um Hilfe zu Feldnamen zu erhalten.'

**Feature  
classification  
table**

**Datasheet  
view and  
design view**

[demo3.mdb](#)



# Database queries and reports with MS Access (e.g. gazetteers)



03\_demo3 : Datenbank- D:\United Nations\Daten\_Oran\lecture\03\_demo3.mdb (Access 2002 - 2003-Dateiformat) - Access

Zaccheddu, Pier-Giorgio

DATEI START ERSTELLEN EXTERNE DATEN DATENBANKTOOLS

Ansicht Einfügen Filtern Sortieren und Filtern

Alle aktualisieren Löschen Suchen

Calibri 11

F K U

Alle Tabellen

demo3

demo3 : Tabelle

Query1

FeatureClassification

FeatureClassification : Tabelle

Query1

Name	FeatureCode	FeatureDesignation
Oued el Ou'am	STM	Stream
Djebel el Ouachba	MT	Mountain
Ouachouache	PPL	Populated Place

The main advantage of database **queries** is that you can join information from different tables in the database, i.e. here **joining the names table and the feature classification**



# Database queries and reports with MS Access (e.g. gazetteers)



03\_demo3 : Datenbank-1

BERICHTSLAYOUTTOOLS

DATEI START ERSTELLEN EXTERNE DATEN DATENBANKTOOLS ENTWURF ANORDNEN FORMAT SEITE EINRICHTEN

Alle Tabellen

demo3

- demo3 : Tabelle
- Query1

FeatureClassification

- FeatureClassification : Tabelle
- Query1

National Gazetteer

Mittwoch, 10. September 2014  
17:23:35

Name	Feature Designation Name	Latitude	Longitude
Oued el Oua'am	Stream	34,78	-1,63
Ouachouache	Populated Place	35,79	7,71
Oran	Administrative Unit	35,66	-0,5
Djebel el Ouachba	Mountain	34,69	2,9

4

Seite 1 von 1

The **report tool** can be used to print the data in a layout defined by the creator. It can build upon a query or a table and can be created in different designs.



# Database queries and reports with MS Access (e.g. gazetteers)



The screenshot displays the Microsoft Access interface. On the left, the 'Alle Tabellen' (All Tables) pane shows a database named 'demo3' with a table 'demo3 : Tabelle'. The main window shows a report titled 'National Gazetteer' with a table of geographical features. The table has columns for Name, Feature Designation Name, Stream, Populated Place, Mountain, Latitude, and Longitude. The data rows are as follows:

Name	Feature Designation Name	Stream	Populated Place	Mountain	Latitude	Longitude
Oued el Ou'a'm					34,78	-1,63
Ouachouache					35,79	7,71
Oran	Administrative Unit				35,66	-0,5
Djebel el Ouachba	Mountain				34,69	2,9

The **report tool** can be used to print the data in a layout defined by the creator. It can build upon a query or a table and can be created in different designs.





# Create main tables and enter names into a database with PostgreSQL/PostGIS

Definition  
and creation  
of a sql-  
database  
with the tool  
pgAdmin

soft- and  
hardware  
skills are  
needed!

The screenshot displays the pgAdmin III interface. On the left, the 'Objektbrowser' (Object Browser) shows a tree view of the database structure. The 'demo3' database is expanded, showing its 'public' schema with a 'demo3' table. The 'Eigenschaften' (Properties) pane on the right shows details for the 'demo3' table, including its name, OID, owner, and tablespace. A 'Daten editieren' (Edit Data) window is open, showing a table with 3 rows and 6 columns: 'idx' (integer, primary key), 'name' (character varying), 'featcode' (character varying), 'Lat' (double precision), and 'Long' (double precision). The data rows are:

idx	name	featcode	Lat	Long
1	Oran	Administrative Unit	35.66	-0.5
2	Oued el Oua'am	Stream	34.77	-1.63
3	Ouachouache	Populated Place	35.77	7.71

Below the data editor, an 'SQL-Feld' (SQL Field) window shows the SQL command used to create the table:

```
-- Table: demo3
-- DROP TABLE demo3;

CREATE TABLE demo3
(
  idx integer NOT NULL,
  name character varying,
  featcode character varying,
  "Lat" double precision,
  "Long" double precision,
  CONSTRAINT demo3_pkey PRIMARY KEY (idx)
)
```



# Databases with MS Access and PostgreSQL/PostGIS



**PostgreSQL  
/PostGIS**

The same  
result with  
both  
database  
tools

**MS Access**

Daten editieren - postgres (localhost:5432) - demo3 - demo3

Datei Bearbeiten Anzeigen Werkzeuge Hilfe

100 Zeilen.

	idx [PK] integer	name character varying	featcode character varying	Lat double precis	Long double precis
1	1234	Oran	Administrative Unit	35.66	-0.5
2	1235	Oued el Oua'am	Stream	34.77	-1.63
3	1236	Ouachouache	Populated Place	35.77	7.71
*	1237	Djebel el Ouachba	Mountain	34.66	2.9

3 rows.

---

03\_demo3 : Datenbank- D:\United Nations\Daten\_Or... TABELLENTOOLS

DATEI START ERSTELLEN EXTERNE DATEN DATENBANKTOOLS FELDER TABELLE

Zaccheddu, Pier-Giorgio

Ansicht Einfügen Filtern Sortieren und Filtern Datensätze Suchen Textformatierung

Alle Tabellen demo3

Name	Feature Designation Name	Latitude	Longitude
Oued el Oua'am	Stream	34,78	-1,63
Ouachouache	Populated Place	35,79	7,71
Oran	Administrative Unit	35,66	-0,5
Djebel el Ouachba	Mountain	34,69	2,9



Federal Agency for  
Cartography and Geodesy

# Databases with the GeoNyms application



GeoNyms - National Gazetteer Application for Toponyms

English

Welcome  New Feature  Import facility

**Load Excel File...** Import to Database

Name	Language	Lat.(decimal Degrees)	Long.(decimal Degrees)	MapSheet	Elivation(in m)	Feature Type	Admin. Division





# Databases with the GeoNyms application



**GeoNyms - National Gazetteer Application for Toponyms** English

Welcome **New Feature** Import facility

General Location Notes **Audio / Visual** Metadata Mapping

### General Information

Name:

Language: Arabic

Feature Type:

Status:

Admin Division:

Priority: ★★★★★

Feature GUID: 80E67FAD-4D2F-37A2-9398-7B3B026C5640

Feature ID:

region1-Madagaskar  
region2-Madagaskar

### Alternate Toponyms

Endonyms	Language

+  
Arabic -

Exonyms	Language

+  
Arabic -

Save Save and Close Cancel



Thank you for your attention!