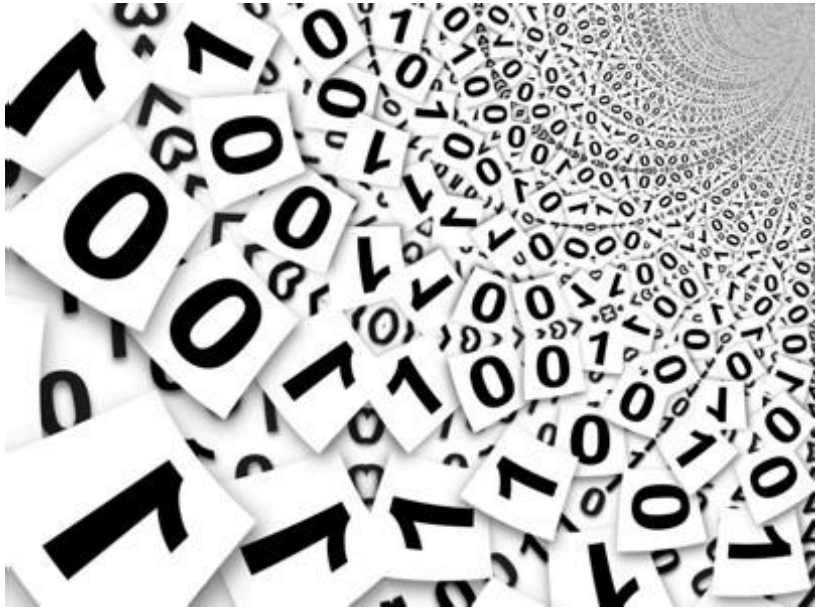
Technische Universität Berlin

Geo-Databases

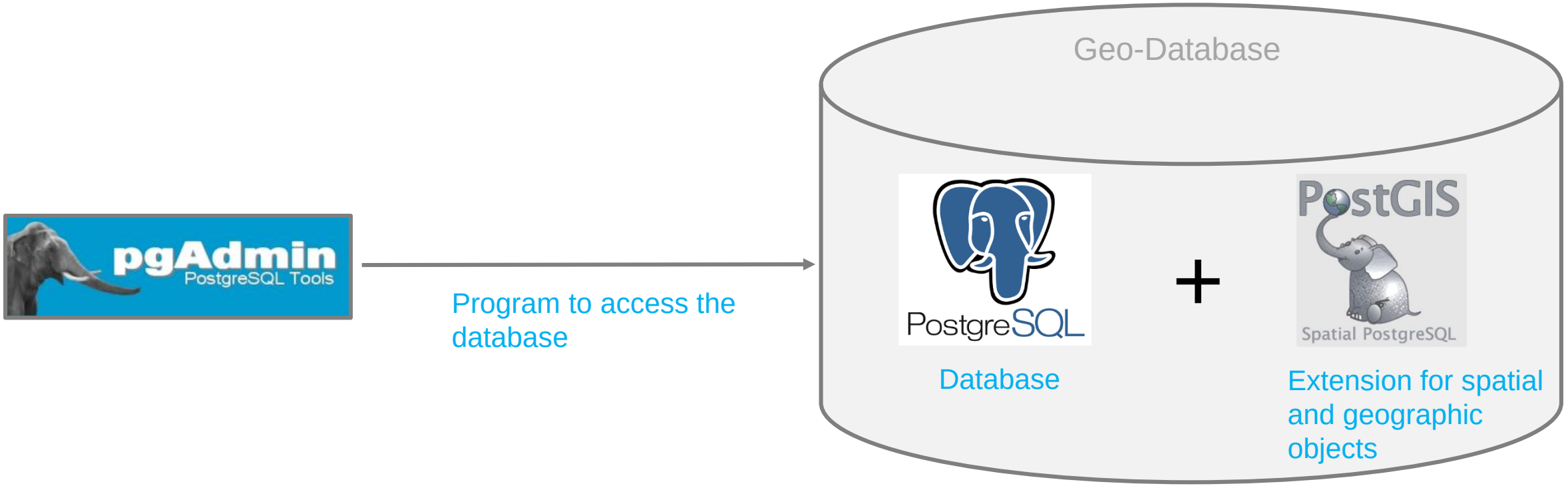
PostGIS

Spatial and Geographic Objects for PostgreSQL



Institute for Geodesy and Geoinformation Science
Technische Universität Berlin

PostgreSQL, PostGIS and pgAdmin




```
CREATE EXTENSION postgis;
```

PostGIS

So far, we worked with simple SQL queries. How to construct spatial queries?

--- > The same way we did it with the other queries. Additionally, we're using spatial expressions!

```
SELECT name, ST_AsText(geom)
FROM yourTable;
```

Note: ST = Spatial Type

Some PostGIS FUNCTIONS

ST_GeometryType(geo)	Returns the geometry type
ST_AsText (geo)	Returns the Well-Known-Text (WKT) representation of the geometry without SRID metadata
ST_AsEWKT (geo)	Returns the Well-Known-Text (WKT) representation of the geometry with SRID metadata
ST_Area (geo)	Returns the area of the surface
ST_Intersects (geo)	Returns TRUE if the geometries intersect and FALSE if they don't
ST_Dimension (geo)	Returns the dimension of the object
ST_IsValid (geo)	Returns if the object is well formed
ST_GeomFromText(geo)	Returns a specified ST_Geometry from Well-Known-Text (WKT)

http://download.osgeo.org/postgis/docs/postgis-2.3.0.pdf

Some PostGIS OPERATIONS

&&	Returns TRUE if a bounding box intersects another bounding box (2D)
&&&	Returns TRUE if a bounding box intersects another bounding box (n-D)
&<	Returns TREUE if a bounding box overlaps or is to the left of another box
&>	Returns TRUE if a bounding box overlaps or is to the
@	Returns TRUE if a bounding box is contained by another box
~=	Returns TRUE if a bounding box is the same as another box
<->	Returns the distance between A and B (2D)

http://download.osgeo.org/postgis/docs/postgis-2.3.0.pdf

The GEOMETRY column in the DB

```
CREATE TABLE objects(
name character varying(70),
geom geometry
);
```



```
INSERT INTO objects ( … ST_GeomFromText … )
```

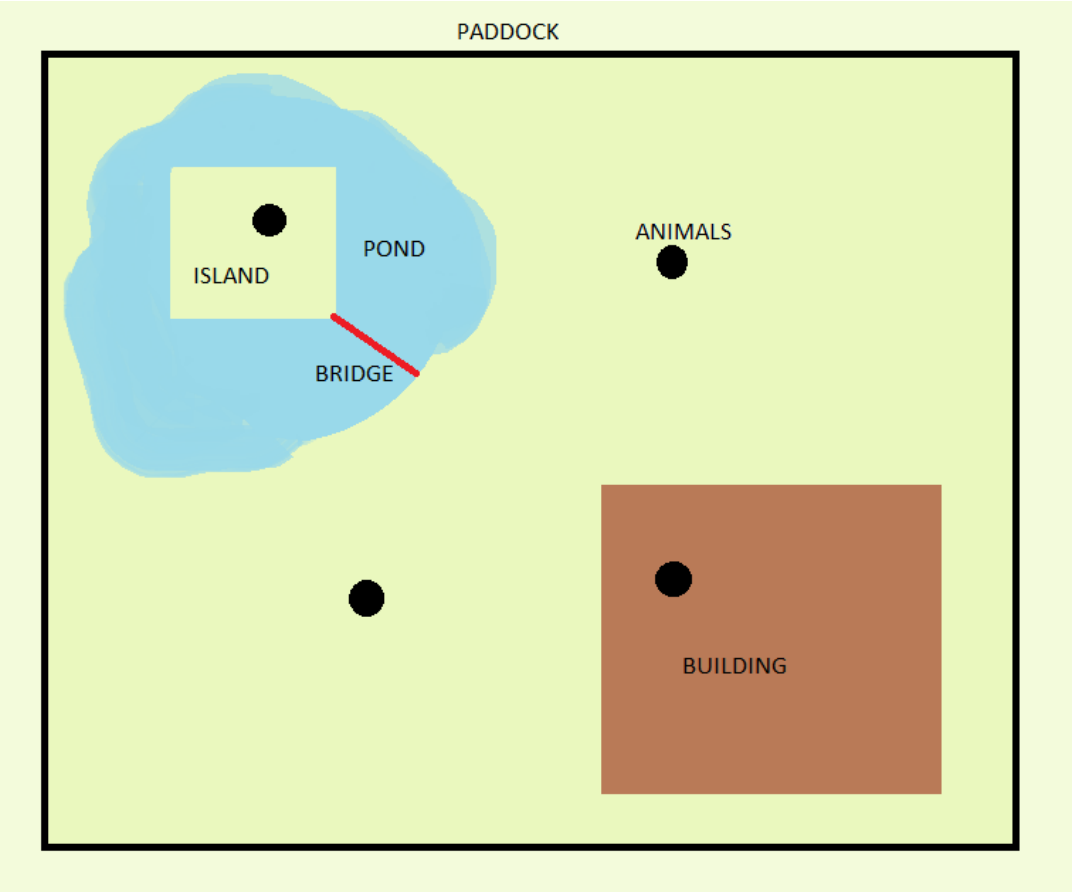
First: Let’s put some data in and test some functions!

```
CREATE TABLE objects (name character varying(70), geom geometry);


INSERT INTO objects (name, geom) Values ('Object1', ST_GeomFromText('POLYGON((-2 -3, 1 -1, 1 1, -2 -3))'));
INSERT INTO objects (name, geom) Values ('Object2', ST_GeomFromText('POLYGON((0 1, 2 4, -2 4, 0 1))'));
INSERT INTO objects (name, geom) Values ('Object3', ST_GeomFromText('POLYGON((0 3, -1 2, 1 1, 0 3))'));
```

1. How does the data look like in the table?
2. Let’s calculate some area’s!
3. Do the objects intersect?
4. More functions please!!

Second: The ‘Little Farm’ Project



→ Just imagine this drawing looks awesome!!

What kind of geometries do we use here?

Tasks

1. How big is the area the animals can use to move around?
2. How many and what kind of animals are on the island or in the building
3. How far away is the Fox from Donkey No 3?
4. How long is the bridge?
5. How many animals are inside the paddock?
6. What kind of animals are within 7m to Horse No 1?
7. How many animals are on the Island and the Building?