

Data modelling and Databases

Project

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1 Phase 1.Creating scheme

1.1 Task

We are needed to transform scheme from technical task into relations

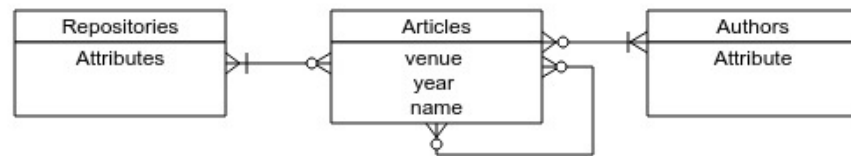


Figure 1: Structure from technical task

1.2 Relations transformations

There are three many-to-many relations. So, we are needed to transform them all into many-to-one relations.

1.2.1 Repositories-Articles

A repository can contain many articles. So, many-to-many field transforms into a table Contains:

1.2.2 Articles-Articles

This relation stands for referencing. In article's bibliography can be many articles. So, it transforms from Article-Article many-to-many relation into:

1. Article-References one-to-many
2. Reference-Article many-to-one.

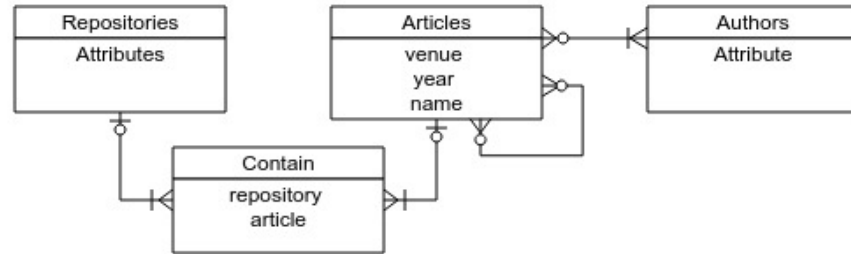


Figure 2: Structure from technical task

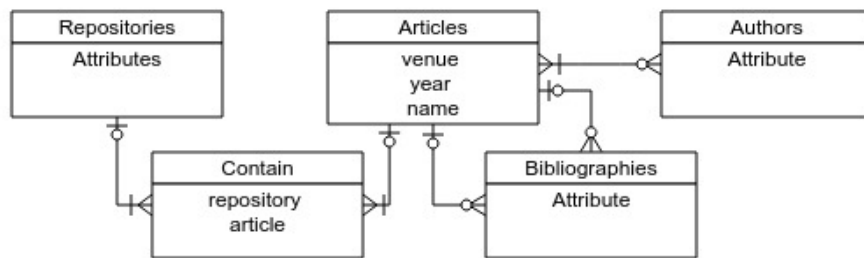
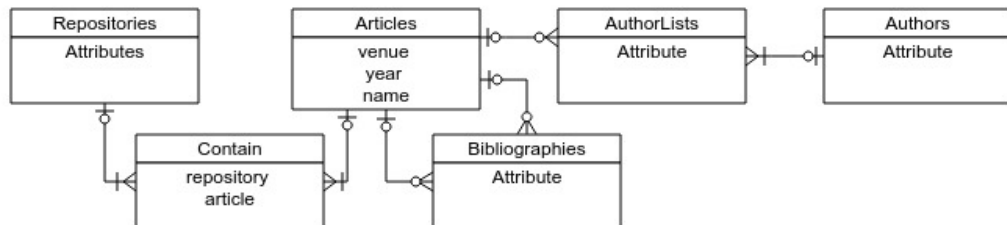


Figure 3: Our structure with Bibliography

1.2.3 Articles-Authors

There can be many authors of one article and each author may have many publication. So, we'll transform Articles-Authors relation into:

1. Article-AauthorList
2. AuthorList



1.3 Writing relations forms

Repositories(id,url,name)
 Contain(id, repository_id, article_id)
 Articles(id,venue, year, name)
 Bibliography(id, article_id, cited_article_id)
 AuthorList(id, article_id, author_id)
 Authors(id, name)

2 Phase 1. Implementing scheme. PostgreSQL

```
1 create database library owner postgres;
```

Listing 1: database initialising

```

1 drop table AuthorLists;
2 drop table Contain;
3 drop table Bibliographies;
4 drop table Repositories;
5 drop table Articles;
6 drop table Authors;
7
8 create table Repositories(
9     id serial primary key,
10    url varchar ,
11    name varchar
12 );
13 create Table Articles(
14     id serial ,
15     venue varchar ,
16     year integer not null default 1900,
17     title varchar ,

```

```

18     primary key(id)
19 );
20 create table Contain(
21     repository_id integer not null ,
22     article_id integer ,
23     foreign key(repository_id) references Repositories(id) ,
24     foreign key(article_id) references Articles(id)
25 );
26 create table Bibliographies(
27     article_id integer ,
28     reference_id integer ,
29     foreign key (article_id) references Articles(id) ,
30     foreign key (reference_id) references Articles(id)
31 );
32 create table Authors(
33     id serial ,
34     name varchar not null default '' ,
35     primary key(id)
36 );
37 create table AuthorLists(
38     author_id integer ,
39     article_id integer ,
40     foreign key(author_id) references Authors(id) ,
41     foreign key(article_id) references Articles(id)
42 );

```

Listing 2: tables initialising

3 Phase 1. Inserting data.

We have python script which parses xml file into sql file with insertions.