Data modelling and Databases

Project

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Contents

1 Phase 1.Creating scheme

1.1 Task

We are needed to transform scheme from technical task into relations

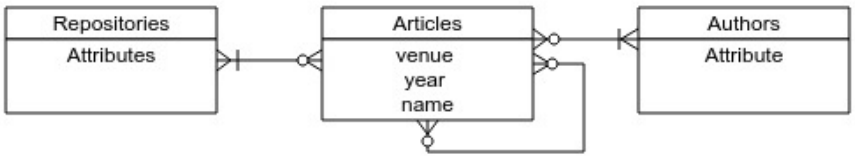


Figure 1: Structure from technical task

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.

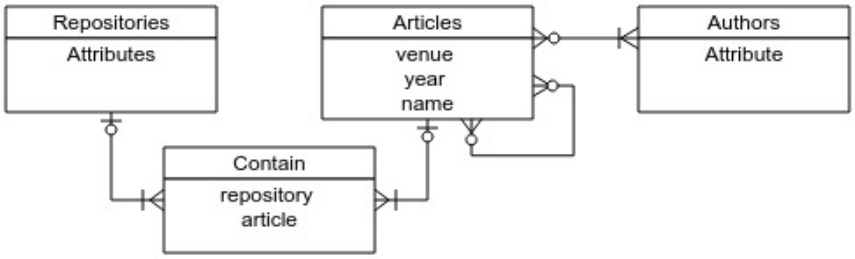


Figure 2: Structure from technical task

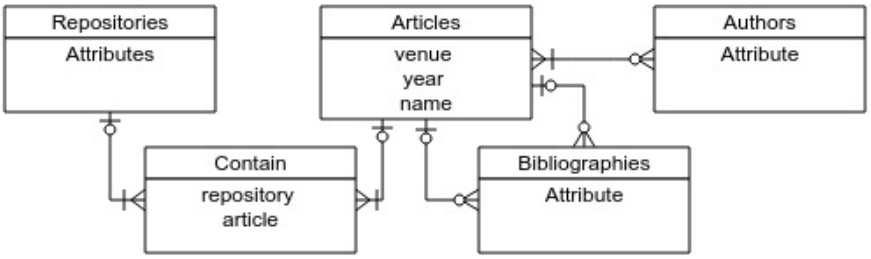
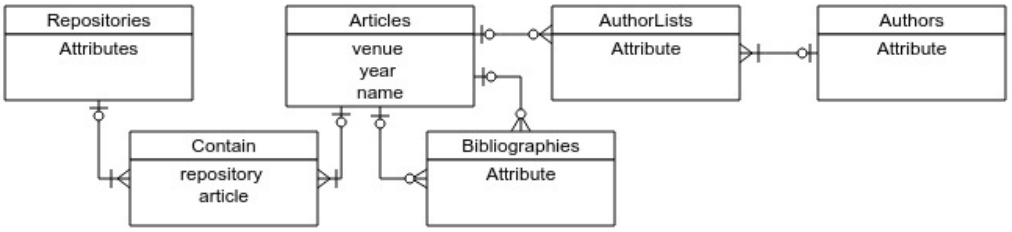


Figure 3: Our structure with Bibliography

1.2.3 Articles-Authors

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

1. Article-AouthorList
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

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

Listing 1: database initialising

```
drop table AuthorLists;
drop table Contain;
drop table Bibliographies;
drop table Repositories;
drop table Articles;
drop table Authors;

create table Repositories(
  id serial primary key,
  url varchar,
  name varchar
);
create Table Articles(
  id serial,
  venue varchar,
  year integer not null default 1900,
  title varchar,
```

```
  primary key(id)
);
create table Contain(
  repository_id integer not null,
  article_id integer,
        foreign key(repository_id) references Repositories(id),
  foreign key(article_id) references Articles(id)
);
create table Bibliographies(
  article_id integer,
  reference_id integer,
  foreign key (article_id) references Articles(id),
  foreign key (reference_id) references Articles(id)
);
create table Authors(
  id serial,
  name varchar not null default '',
  primary key(id)
);
create table AuthorLists(
  author_id integer,
  article_id integer,
  foreign key(author_id) references Authors(id),
  foreign key(article_id) references Articles(id)
);
```

Listing 2: tables initialising

3 Phase 1. Inserting data.

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