Data modelling and Databases

Project

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Contents

1 Phase 1.Creating scheme

1.1 Task

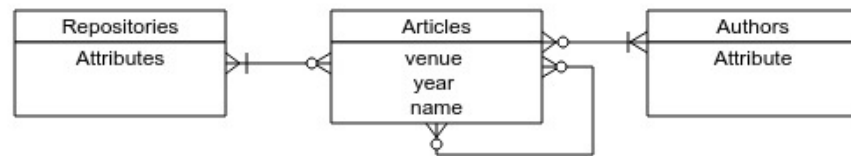We are needed to transform scheme from technical task into relations

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
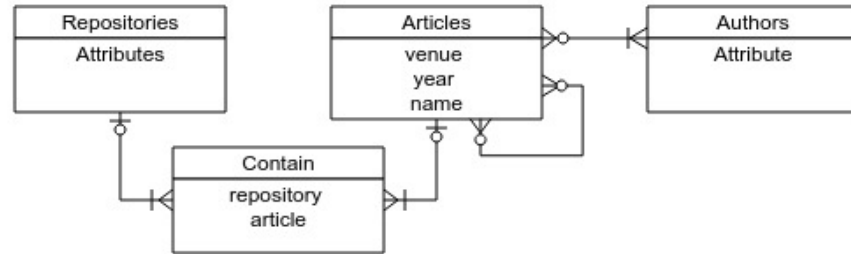
2. Reference-Article many-to-one.
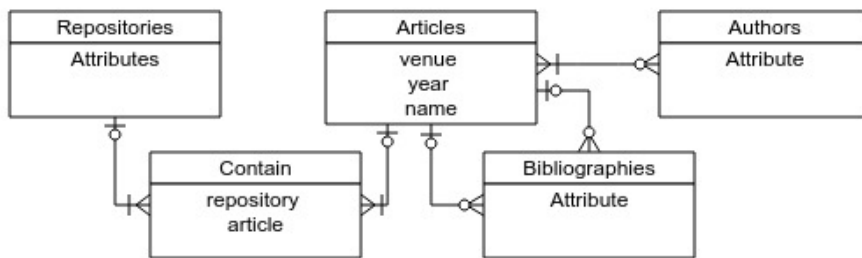
Figure 2: Structure from technical task
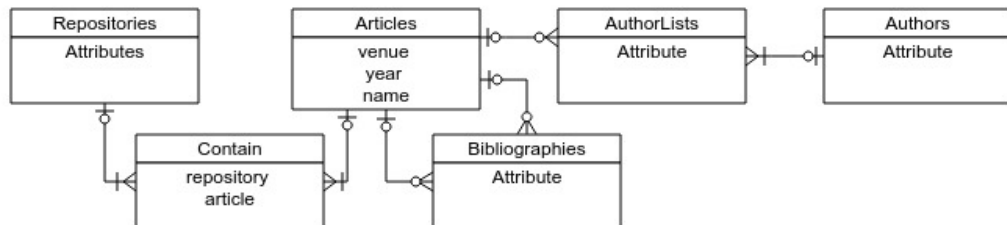

Figure 3: Our structure with Bibliography

1.2.3 Articles-Authors

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

1. Article-AuthorList

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.