″Ollert

Project Report
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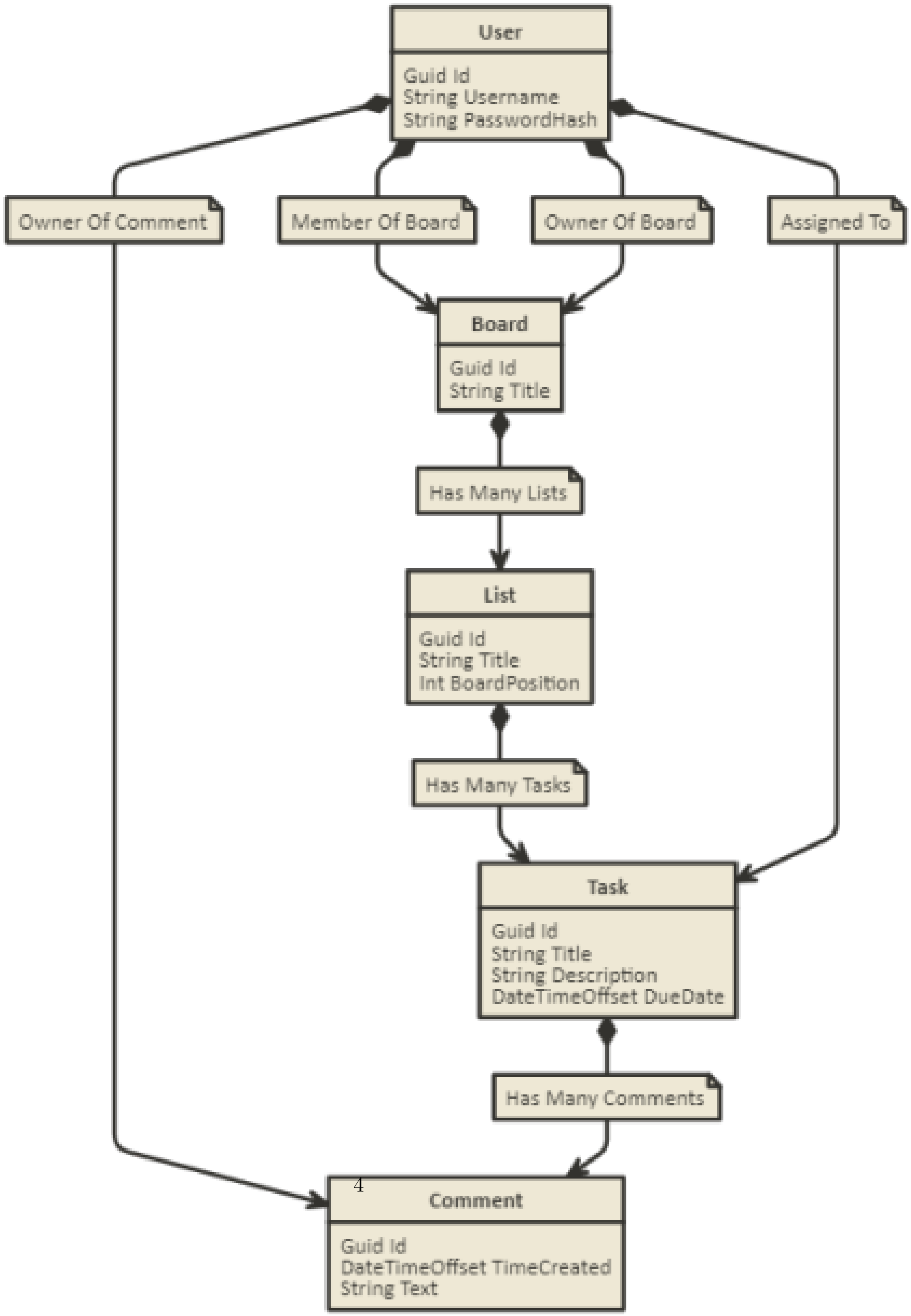
Contents

1 Database Design

1.1 Introduction

Ollert is the backend database for a Kanban Board application (similar to https://Trello.com). It supports multiple users collaborating on one or many boards, through comments and task generation.

1.2 ER Diagram



1.3 Identified Constraints

- Every application user must have both a username and a password
- Usernames must be unique
- Every board must have a title and must be associated with an existing owner
- Every comment must have an owner
- Every comment must have a time and text
- Every comment must be associated with an existing task
- Every list must have a title and must be associated with an existing board
- Every task must be associated with an existing list
- Every entity in every table has a unique id

1.4 Assumptions About the Domain

- Users should only have access to the boards they are members of

1.5 Database Design Process

1.6 Ollert's tables

1.6.1 Functional Dependencies

1.6.2 Primary Keys

- ApplicationUser
  - ApplicationUser.Id
- Board
  - Board.Id
- BoardMember
  - none
- List
  - List.Id
- Task
  - Task.Id
- TaskAssignee

  - none
- Comment
  - Comment.Id

1.6.3 Foreign Keys

- Board
  - ApplicationUser.Id
- BoardMember
  - Board.Id
  - ApplicationUser.Id
- List
  - Board.Id
- Task
  - List.Id
- TaskAssignee
  - Task.Id
  - ApplicationUser.Id
- Comment
  - Task.Id
  - ApplicationUser.Id

2 Database Implementation

2.1 Create Table Statements

```
create table ApplicationUser(
  Id char(32),
  Username varchar(100) not null,
  Passwordhash varchar(100) not null,
  primary key ( Id )
);

```

Listing 1: ApplicationUser Table Creation Statement

```
create table Board(
  Id char(32),
  Title varchar(100) not null,
  OwnerId char(32),
  primary key ( id ),
  foreign key ( OwnerId ) references ApplicationUser( Id )
);

```

Listing 2: Board Table Creation Statement

```
create table BoardMember(
  BoardId char(32),
  MemberId char(32),
  foreign key ( BoardId ) references Board( Id ),
  foreign key ( MemberId ) references ApplicationUser( Id )
);

```

Listing 3: BoardMember Table Creation Statement

```
create table List(
  Id char(32),
  Title varchar(100) not null,
  BoardPosition int not null,
  BoardId char(32),
  primary key ( id ),
  foreign key ( BoardId ) references Board( Id )
);

```

Listing 4: List Table Creation Statement

```
create table Task(
  Id char(32),
  Title varchar(100) not null,
  Descriptor varchar(500) not null,
  DueDate datetimeoffset,
  ListId char(32),
  primary key ( id ),
  foreign key ( ListId ) references List( Id )
)

```

Listing 5: Task Table Creation Statement

```
  create table TaskAssignee(
    TaskId char(32),
    AssigneeId char(32),
    foreign key ( TaskId ) references Task( Id ),
    foreign key ( AssigneeId ) references ApplicationUser( Id )
  )

```

Listing 6: TaskAssignee Table Creation Statement

```
  create table Comment(
    Id char(32),
    TimeCreated datetimeoffset not null,
    MessageText varchar(100) not null,
    TaskId char(32),
    OwnerId char(32),
    primary key ( id ),
    foreign key ( TaskId ) references Task( Id ),
    foreign key ( OwnerId ) references ApplicationUser( Id )
  )

```

Listing 7: Comment Table Creation Statement

2.2 Insert Statements

```
insert into ApplicationUser values ("19843875-6077-49", "Walter
  Rogers",
 "168
  E5F6A717237FB2232A8AFE2DAAE3F8D582C5D4CC0EAA268F05F420F1EC421")
  ;

insert into ApplicationUser values ("372a9ad5-4952-44", "Jean
  Bryant",
 "
  DAB12D7BB613EAC0304D9917738729FB37B60EBB1FB59FC9493ED64733CCE3BA
  ");
```

Listing 8: ApplicationUser Insert Statements

```
insert into Board values ("bbdd7100-cd10-41", "Sports Forum
  Mobile App", "19843875-6077-49");

insert into Board values ("62376bd0-6ecc-4f", "Untitled
  Platformer Game", "372a9ad5-4952-44");
```

Listing 9: Board Insert Statements

```
insert into BoardMember values ("fdd8f8a8-0d53-4f", "19843875-6077-49");

insert into BoardMember values ("bbdd7100-cd10-41", "372a9ad5-4952-44");
```
Listing 10: BoardMember Insert Statements

```
insert into List values ("64251244-40f5-45","Admin Website", 2, "bbdd7100-cd10-41");

insert into List values ("a583557a-3d83-4a","Art Design", 0, "62376bd0-6ecc-4f");
```
Listing 11: List Insert Statements

```
insert into Task values ("e01479d6-6019-4a", "Database Design", "Design a robust database schema for storing all the data in our app.", "20180120 09:00:00 +10:00", "0e72d679-da23-41");

insert into Task values ("d46993c0-ce64-46", "Story Design", "Write a fun story for the game.", "20180620 09:00:00 +10:00", "a583557a-3d83-4a");
```
Listing 12: Task Insert Statements

```
insert into TaskAssignee values ("ac1a2b65-d1fc-47","88b03172-135a-4b");

insert into TaskAssignee values ("a9f5ae59-6193-40","d263667b-ea46-4b");
```
Listing 13: TaskAssignee Insert Statements

```
insert into Comment values("c088cfa0-15e2-4f", "20180110 08:54:00 +10:00", "I'm probably going to need some help with this.", "e01479d6-6019-4a", "372a9ad5-4952-44");

insert into Comment values("59646b1b-a084-49", "20180120 08:54:00 +10:00", "So I'm thinking our game has a mario-like character - but green.", "a9f5ae59-6193-40", "d263667b-ea46-4b");
```
Listing 14: Comment Insert Statements

2.3 Data manipulation statements

2.3.1 Select statements

```
SELECT TOP 1 Count(*) as NumComments, Username FROM ApplicationUser
    , Comment WHERE ApplicationUser.Id=Comment.OwnerId GROUP BY
    Username ORDER BY NumComments desc;
```

Listing 15: Select Most Active Task by Number of Comments

```
SELECT TOP 1 Count(*) as NumComments,Title FROM Task, Comment WHERE
     Task.Id=Comment.TaskId GROUP BY Title ORDER BY NumComments
    desc;
```

Listing 16: Select Most Active User (Comments)

2.3.2 Other Statements

2.3.3 Update statements

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Listings