Entity:

Users: We think each user is uniquely identified by “userID”. This entity also contains 3 more attributes: “name”, “introduction”, and “password”.

Statistics: This statistic provides daily feedback for a user. Statistics is a weak entity. It is identified by userID and date together. It also has 2 more attributes: “count”, number of news viewed in one day and “length”, length of time in minutes staying on the app.

Category: We think each “Category” is uniquely identified by “category name”, a string containing characters and numbers. Each category should contain “count”, an integer value to keep track of the number of news in the specific category.

Comments: We think each “Comment” is uniquely identified by “commentID”, a string containing characters and numbers. Each piece of news should contain context, a string to record the content of the comment. Date is also included, as type DATETIME to keep track of the date the comment was written. The last element is vote, an integer to keep track of how many upvotes given by other users towards each comment.

News: We think that each news is uniquely identified by its ID named “newsID”, a string of characters and numbers, and has two additional attributes “date”, an integer, and “title”, a string of characters and numbers.

Relationship:

1. Statistics to Users (many to one): A statistic is owned by exactly one user, while a user can have multiple statistics.
2. Category to News (many to many): Each category should contain zero to infinitely many pieces of news while each piece of news can be classified to many (zero to infinitely many) categories.
3. Comments to News (many to one): Each comment should only be classified to one piece of news, while each piece of news and contain zero to infinitely many comments.
4. Comments to Users (many to one): Each comment can only be written by one specific user, while each user can create zero to infinitely many comments.

Schema:

```
CREATE TABLE News(
        NewsID VARCHAR(20) NOT NULL PRIMARY KEY,
        Date DATETIME,
        Title VARCHAR(50)
);

CREATE TABLE Comments(
        CommentID VARCHAR(20) NOT NULL PRIMARY KEY,
        Context VARCHAR(255),
        Date DATETIME,
        Vote INT,
        NewsID VARCHAR(20) NOT NULL,
        UserID VARCHAR (20) NOT NULL,
        FOREIGN KEY (NewsID) REFERENCES News(NewsID),
        FOREIGN KEY (UserID) REFERENCES Users(UserID)
);

CREATE TABLE Users(
        UserID VARCHAR(20) NOT NULL PRIMARY KEY,
        Name VARCHAR(20),
        Introduction VARCHAR(255),
        Password VARCHAR(15)
);

CREATE TABLE Category(
        CategoryName VARCHAR(20) NOT NULL PRIMARY KEY,
        Count INT
);

CREATE TABLE Statistics(
        Date DATETIME NOT NULL,
        Count INT,
        Length INT,
        UserID VARCHAR(20) NOT NULL,
        FOREIGN KEY (UserID) REFERENCES Users(UserID)
        PRIMARY KEY(Date, UserID)
);

CREATE TABLE Have(
        CategoryName VARCHAR(20),
        NewsID VARCHAR (20) NOT NULL,
        FOREIGN KEY  CategoryName REFERENCES Category(CategoryName),
```

```
        FOREIGN KEY  NewsID REFERENCES News(NewsID),
        PRIMARY KEY(CategoryName, NewsID)
);
```