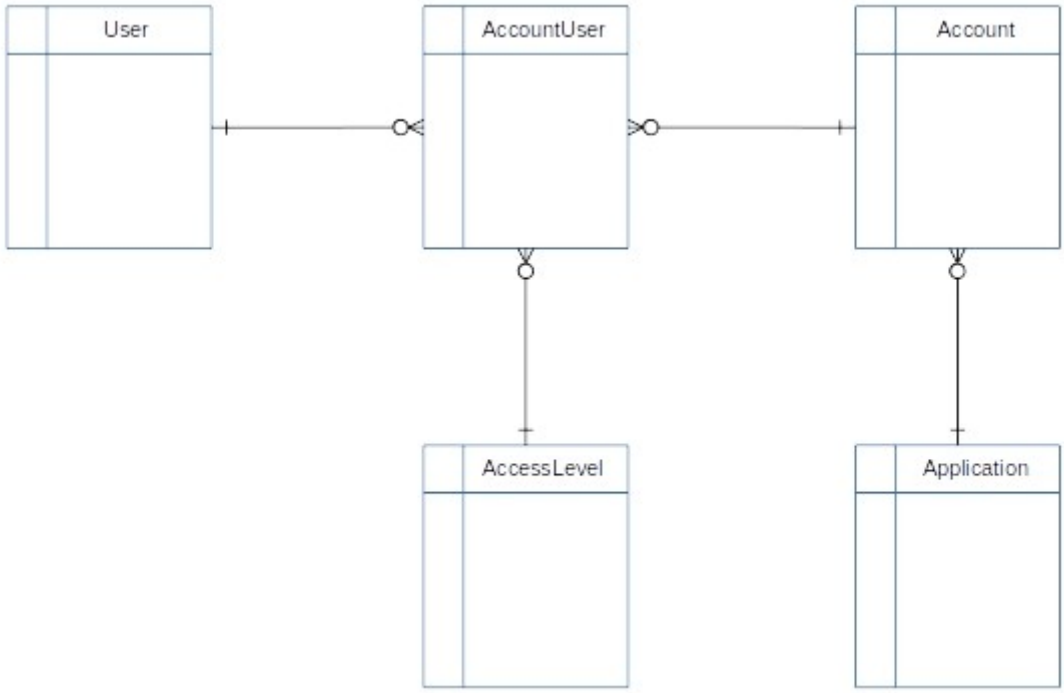
This project implements the Java Authentication and Authorization Service (JAAS) application interface using a simple relational database model which I have used it to control access to my own apps in the past. The data model is quite simple and naturally open to enhancements but suffices as a starting point. The diagram shows that it basically implements a many-to-many relationship between users and accounts.



This project does not provide an interface into maintaining the data model but does implement a simple DAO pattern which provides many of the methods for this purpose. These are used in the test files which carry out the basic CRUD actions. Testing uses the HSQLDB in-memory database which means that no RDBMS needs to be installed but if DDL is required then the following is the Hibernate output may suffice to create a permanent database

```
create table access_level (id integer generated by default as identity (start with 1), description
varchar(255), primary key (id))

create table account (id integer generated by default as identity (start with 1), active
char(255), application_id integer not null, create_date timestamp, resource_name varchar(255),
primary key (id))

create table account_user (user_id integer not null, account_id integer not null, access_level_id
integer not null, account_message varchar(255), active char(255) not null, create_date timestamp,
last_access_date timestamp, primary key (user_id, account_id))

create table application (id integer generated by default as identity (start with 1),
accept_registration char(255), active char(255), name varchar(255), primary key (id))

create table user (id integer generated by default as identity (start with 1), active char(255),
create_date timestamp, password_salt varbinary(255), user_email varchar(255), user_name
varchar(255), user_password varbinary(255), primary key (id))

alter table application add constraint UK_lspnba25gpku3nx3oecprrx8c  unique (name)

alter table user add constraint UK_j09k2v8lxofv2vecxu2hde9so  unique (user_email)

alter table account add constraint FK_4jheadnpp76a6cg4b1qgoyc3a foreign key (application_id)
references application on delete cascade

alter table account_user add constraint FK_55gdak91rn0dt91ewprxjosog foreign key (account_id)
```

```
references account on delete cascade

alter table account_user add constraint FK_oi67uyc3ncs55upo8ktu6791d foreign key (user_id)
references user on delete cascade

alter table account_user add constraint FK_8luh3b98tnopwmffmtn54i7em foreign key (access_level_id)
references access_level
```

The config file used for testing is shown below. Note that the application login expect its own class name as the application name.

```
/** Login Configuration for the JAAS test Application **/

ApplicationAccountLogin {
   com.bac.applicationaccount.AccountLoginModule required;
};
```

Encryption uses the PBKDF2WithHmacSHA1 algorithm but the coupling to this will be removed to allow it to be injected as required.