ICP 2151 - Advanced Java
Programming Assessment - Deutsche Akademie

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Contents

1   Introduction

1.1   Purpose

The function and purpose of this program is to provide a learning experience to students of the 'Deutsche Akademie'. This is provided through assessing the students with 20 randomly selected words from a certain area of German. Registered students have the ability to take these tests and see their results. Registered administrators can see the results of all or specific students, they also have access to the database of words, with this access right they are able to add, delete or modify the tables in the database.

1.2   Implemented technologies

JDBC (Java database connectivity technology) - The database constructed has tables containing words from different areas of the German vocabulary, their gender marker and the English translation. This database also contains information about the users of the system.
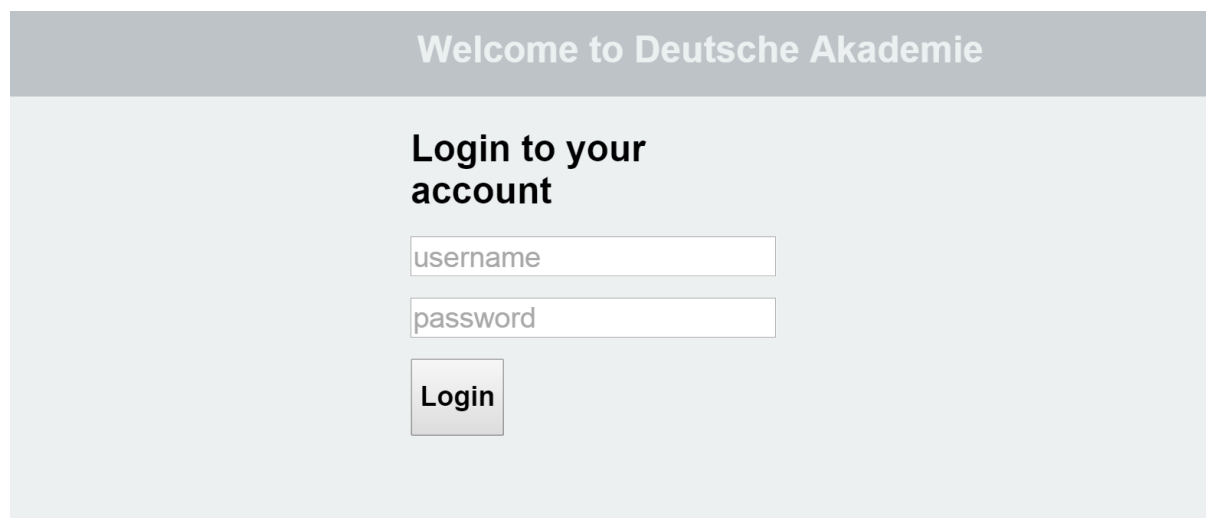Web Server(GlassFish) - The web server is used to host a connection between the database and the Servlets. Thus enabling the ability to use two separate technologies.
Servlets - These are small Java programs run within the Web server. The Servlets receive and respond to requests from Web clients, these requests are sent via HTTP(Hyper Text Transfer Protocol).

2   Login System

2.1   Users

The system has two types of users Students and Administrative users. The decision was made to merge the roles of Administrative user and Instructor together as they have the same access rights. The portal to log in is the same for students and admin.
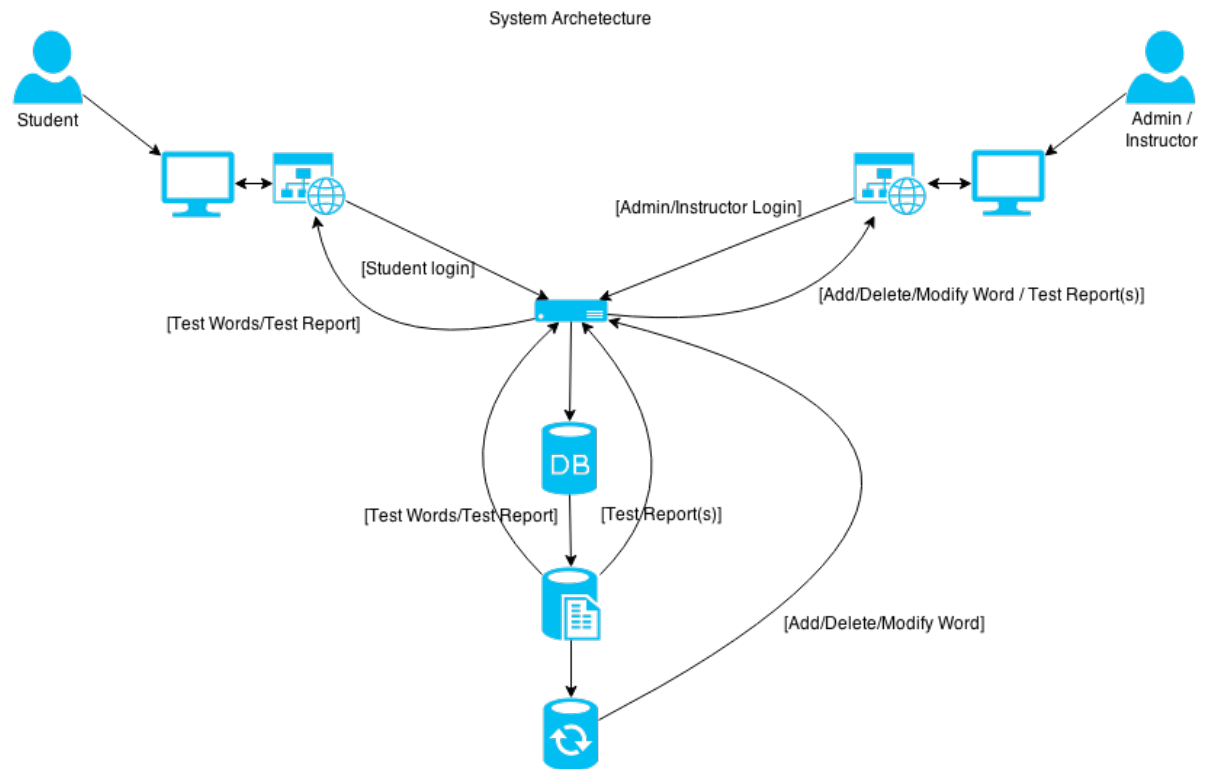
2.2   Student

Once registered, students have the ability to take tests, see their results and to see previous test results. They also have access to a Dictionary function so if they are unsure of a word they can find out what the translation and gender. User names entered must be unique to every student, password has a double validation field requiring the student to enter their password twice upon registry. User names are not case sensitive, whereas the password field is.

## 2.3   Administrative Users / Instructors

The 'admin' account is predefined in the database along with the password. This account is used to add new students to the system. It is also responsible for adding, deleting or modifying words. Through this account is the ability to view the students test results as well.

3   UML Diagrams

3.1   System Architecture
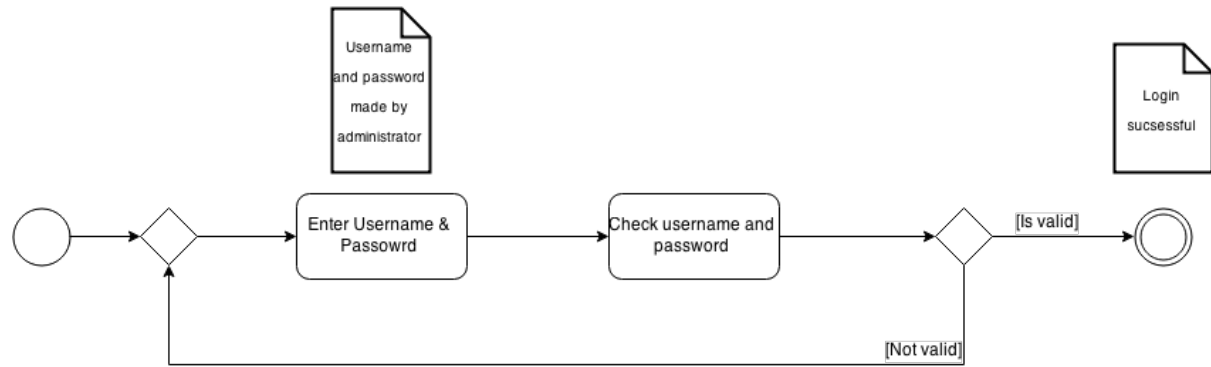

System Archetecture

3.2   Use Case Diagram
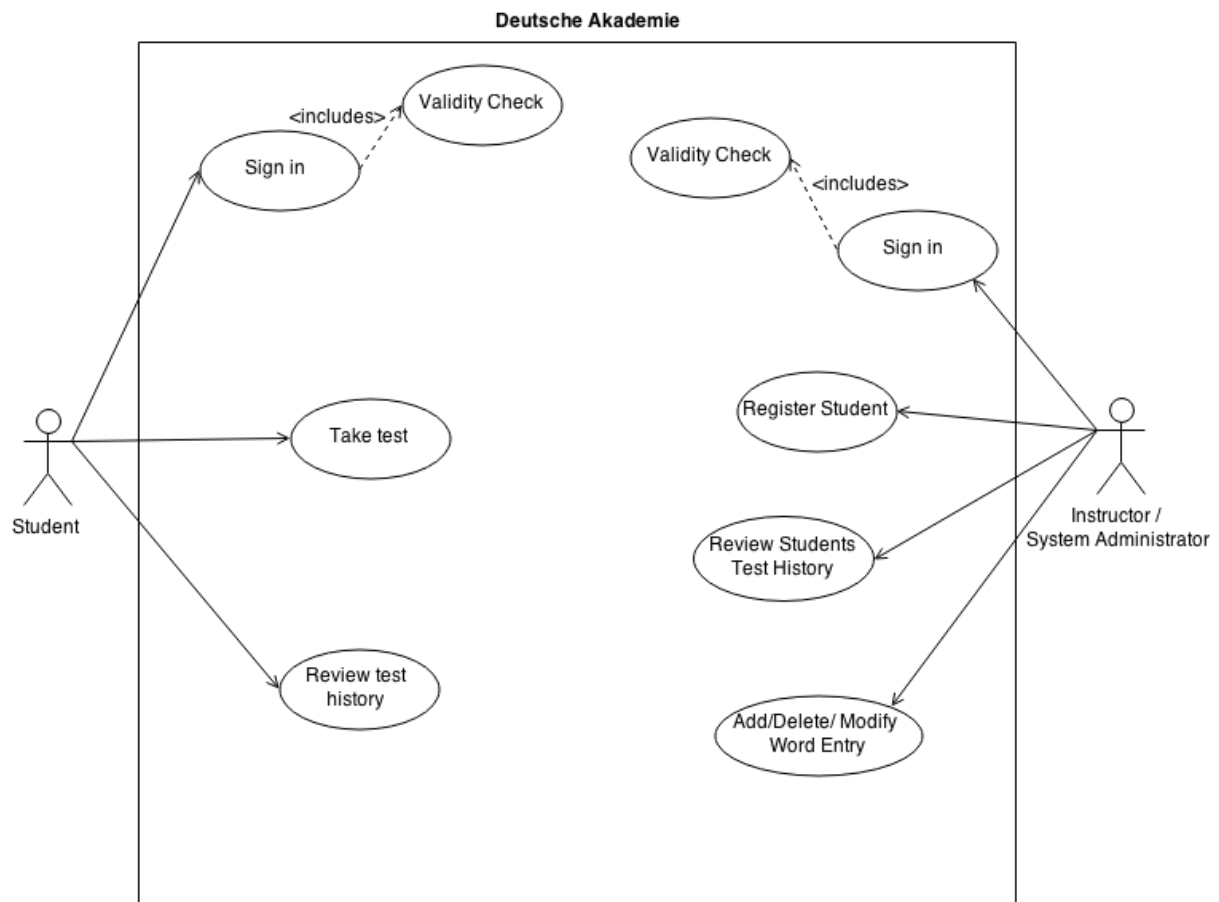
3.3   Activity Diagrams

3.3.1   Student Side

Student Login & Validity Check

Take Test

Student Test History
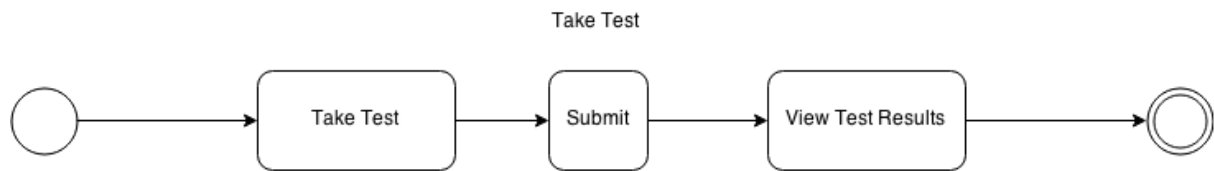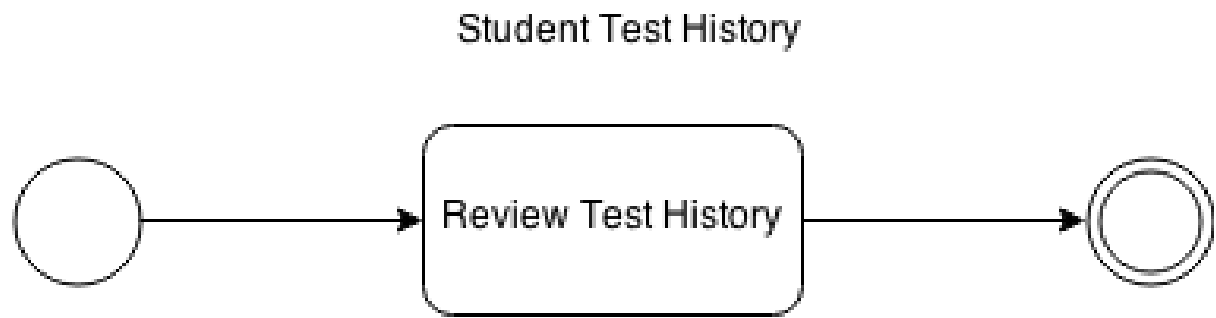
3.3.2   Instructor / System Administrator Side

Instructor / System Administrator Login & Validity Check

Register Student

Admin test history reviewing.

Admin Add/Delete/Modify

Allows the administrator to add,
delete or modify the tables

Select table

Add Word

Delete Word

Modify Word
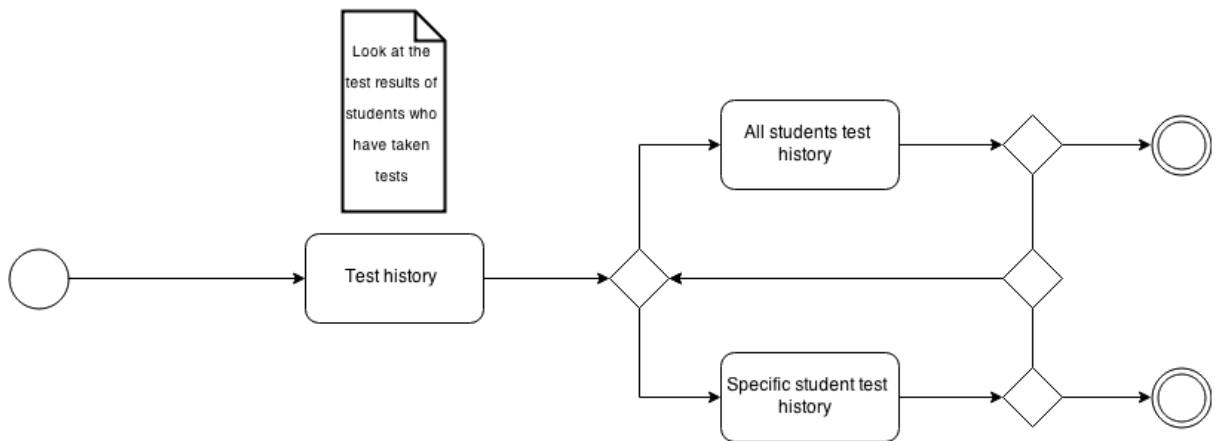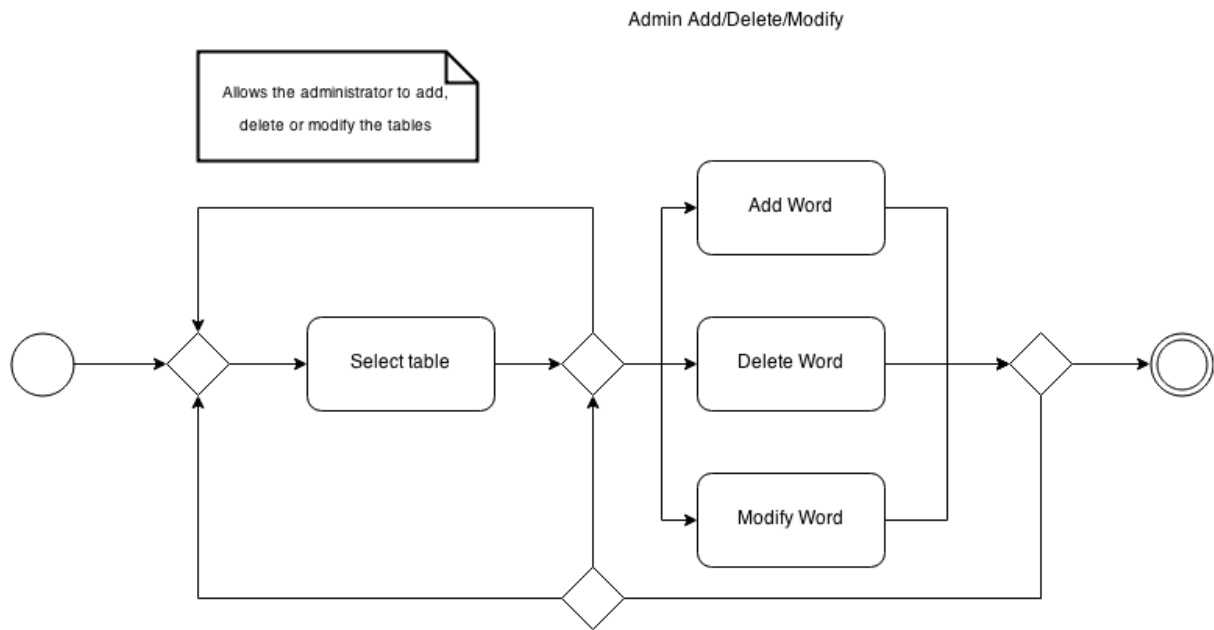
3.4 Sequence Diagram

4 Database

4.1 EER Diagram

4.2   Database Design

The database has been designed with six tables of translated words amounting to 2595 words. Another table contains the information about the admin account and students registered on the system. The final table saves the test result data of the students.
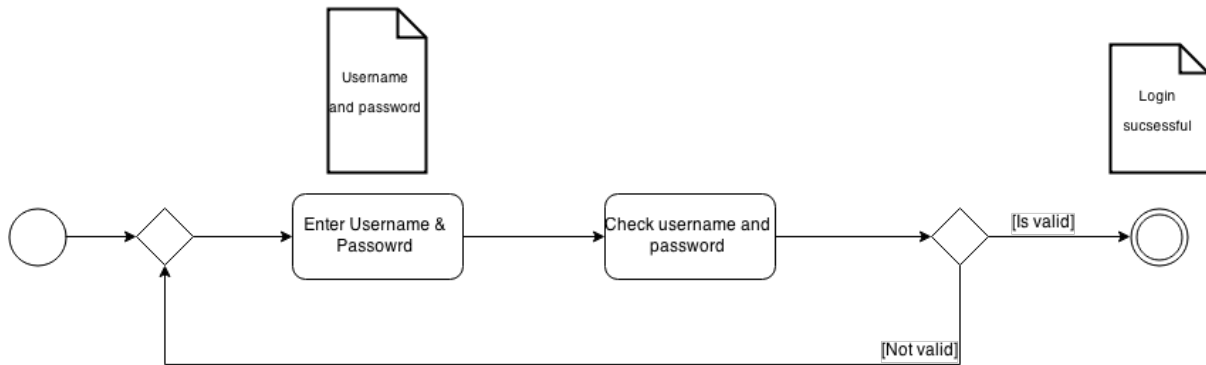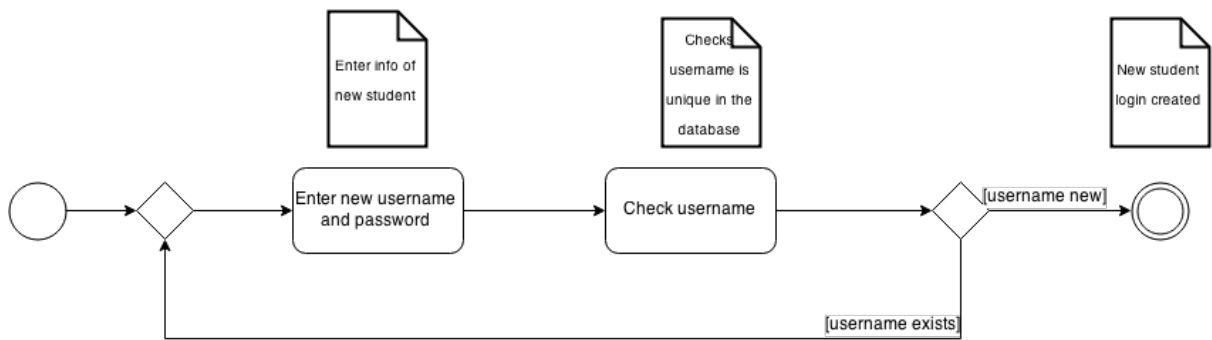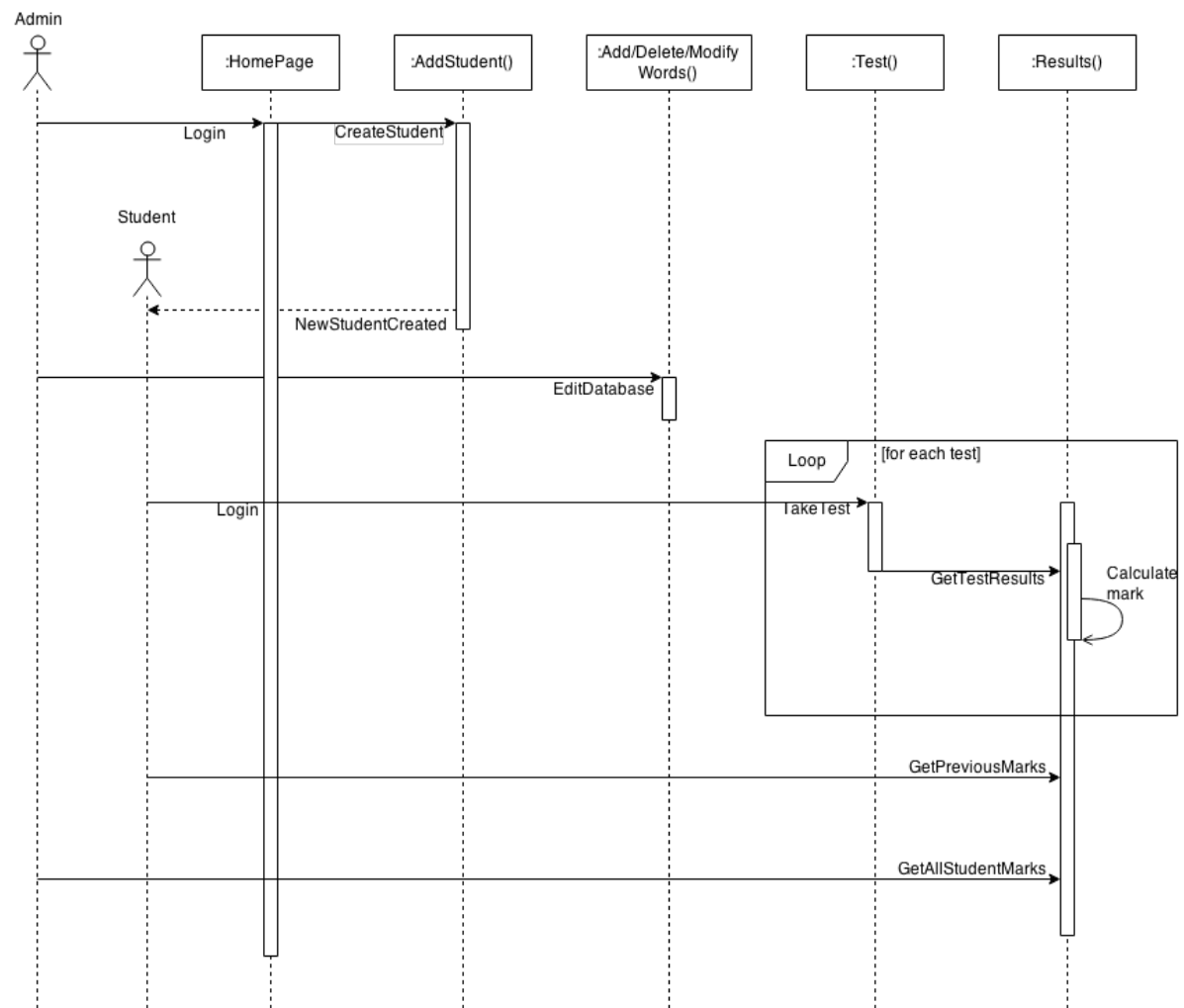
4.2.1   Database Tables

The database contains eight tables. Six of which have the format of the table below these tables are called:

- area_a_home_and_abroad

- area_b_education_and_employment

- area_c_house_home_and_daily_routine

- area_d_the_modern_world

- area_e_social_activities_fitness_and_health

- non_topic_specific_vocabulary

Each of these tables contains a different section of the 'Edexcel Level 1/Level 2 Certificate in German (KGN0)' document. Below is an explanation of each column:

- word_id - Is the primary key, must have a value of not null and it auto increments when a new row is added. Its type is int.

- category - Relates to the part of a section of the document mentioned above. it is a contraction of the sub category title, it can be null as it can not have a sub category. Its type is varchar.

- german_word - This is the German word. Its type is varchar, and it cannot have a null value.

- german_word_type - This is the gender of the word that is usually depicted in the translation document being inside parenthesis's. Its type is varchar, and it can have a value of null as the German word may be a word without a gender type.

- english_word - This is the English translation of the German word its type is varchar and it cannot have a value of null.

word_id	category	german_word	german_word_type	english_word
1	LITARL	Ampel	f	traffic light

The final two tables are:

accounts

account_id	account_name	account_password	account_status
1	admin	thepassword	admin
2	mike	helloWorld	student

- account_id - primary key, its type is integer and unique.
- account_name - Varchar type, username to login.
- account_password - Varchar type, password used to log in.
- account_status - Varchar type, either admin or student.

test_history

test_id	test_score	test_time	account_id
1	10	2015-05-01 02:40:26	1
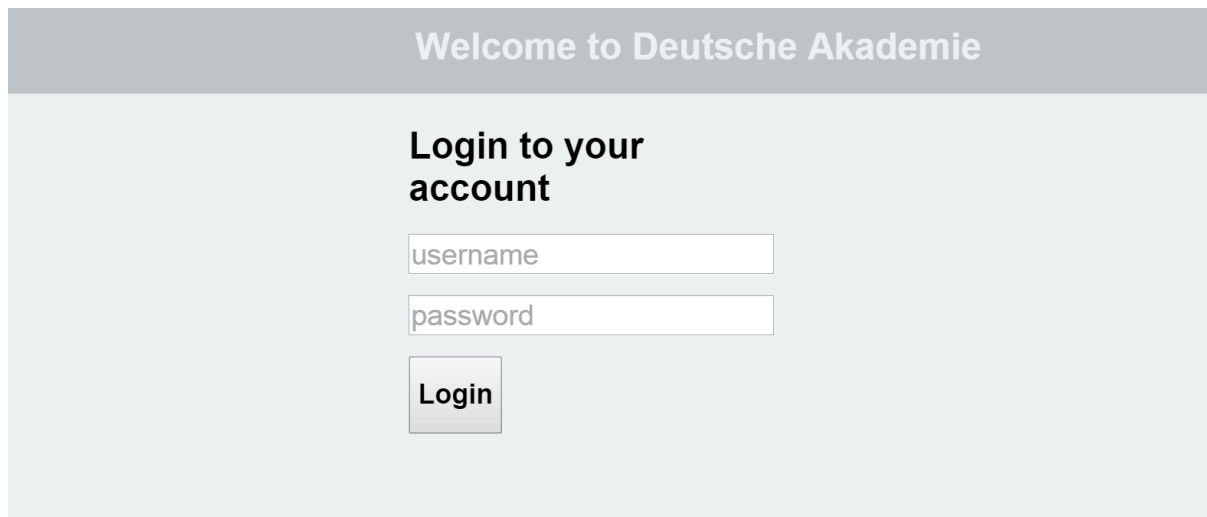
- test_id - primary key, unique id.
- test_score - score revived from taking test type double as you can have mark with a decimal place.
- test_time - timestamp, from the date/ time of entry.
- account_id - who took the test.

5   Testing

This section will be covering testing that was done on the system.
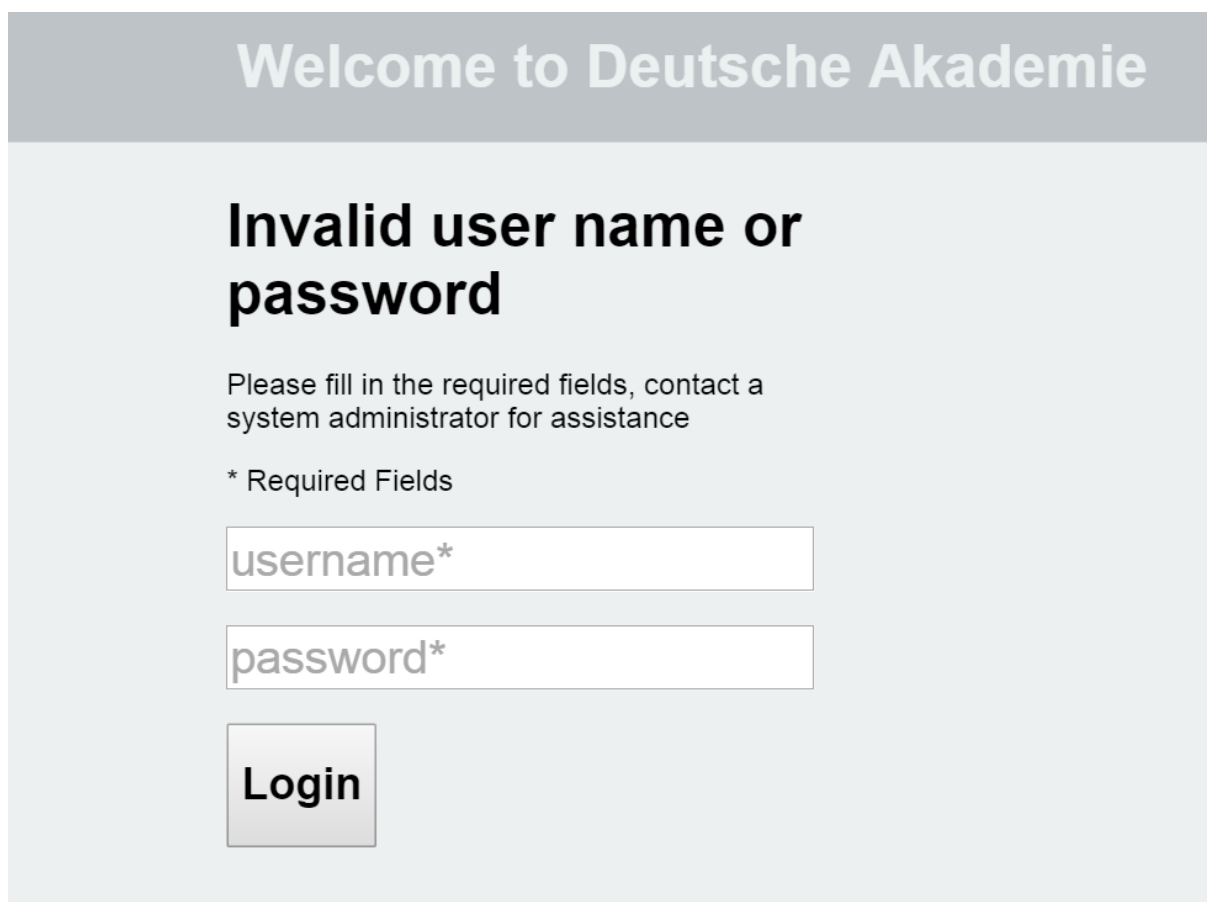
5.1   Login

This is the login portal for both student and admin.

If the login is unsuccessful this page will be displayed.

5.2   Student Side

After successful login the student will see this page.
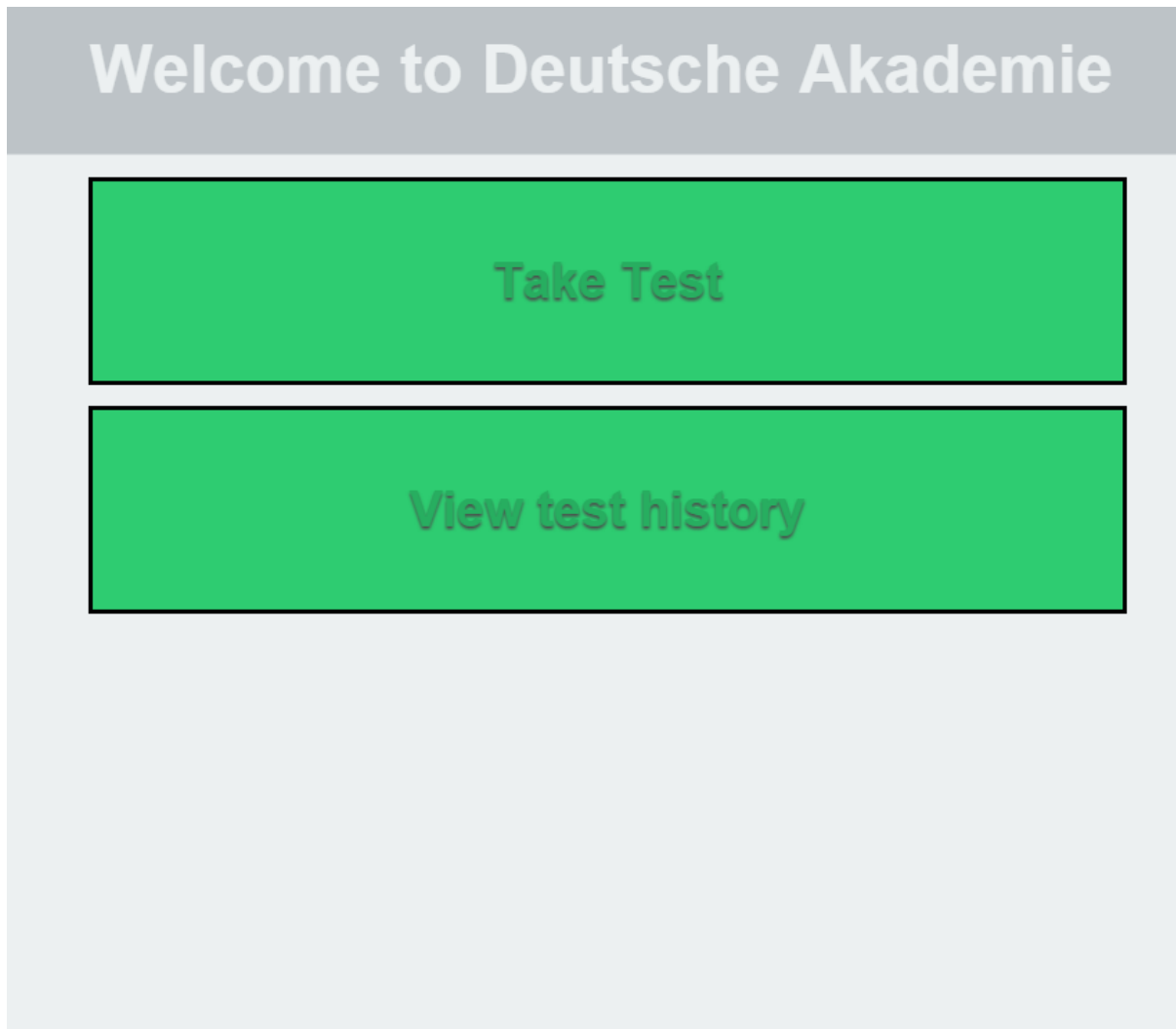
5.2.1   Take Test

While undertaking the test there are certain words which can have multiple English meanings. In this case it is difficult to know the exact correct answer as the one German word can have two or three English meanings.

The image of the test can be seen below.

1) What is the German word for see you tomorrow?

Word

2) What is the German word for down?

Word

3) What is the German word for punctually?

Word

4) What is the German word for in the winter?

Word

5) What is the German word for Scotland?

Word

6) What is the gender and meaning of the German word halten?

Gender | Meaning

7) What is the gender and meaning of the German word schreiben?

Gender | Meaning

8) What is the German word for to sit?

Word

9) What is the gender and meaning of the German word dankbar?

Gender | Meaning

10) What is the gender and meaning of the German word heute?

Gender | Meaning

5.2.2   Results

The results from the test are displayed in the image below.
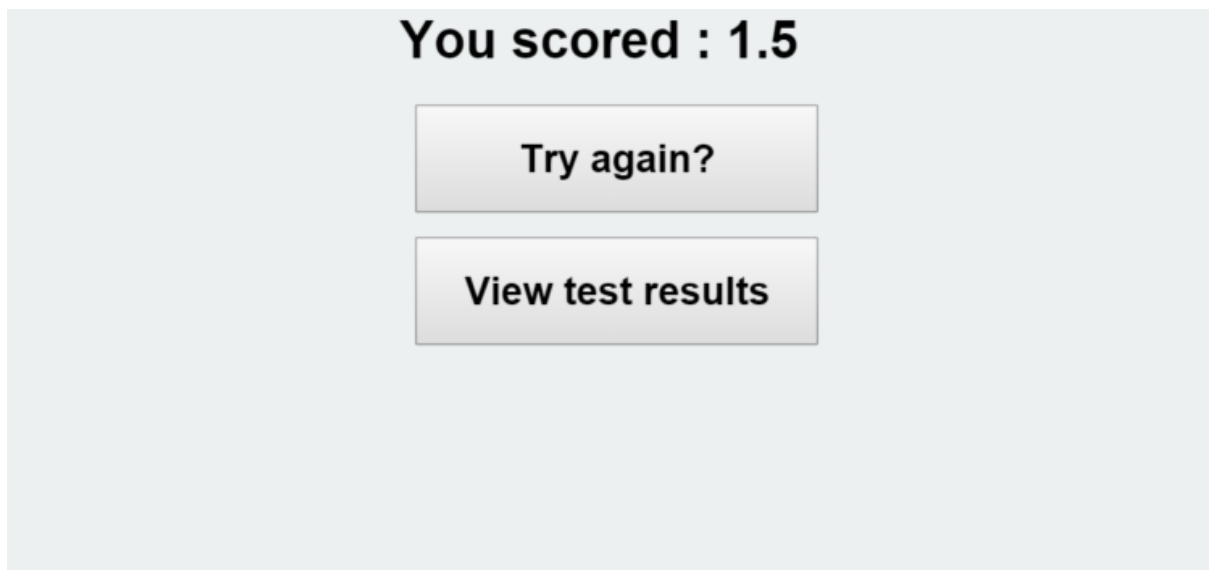
Previous results can be found from the view test history button.
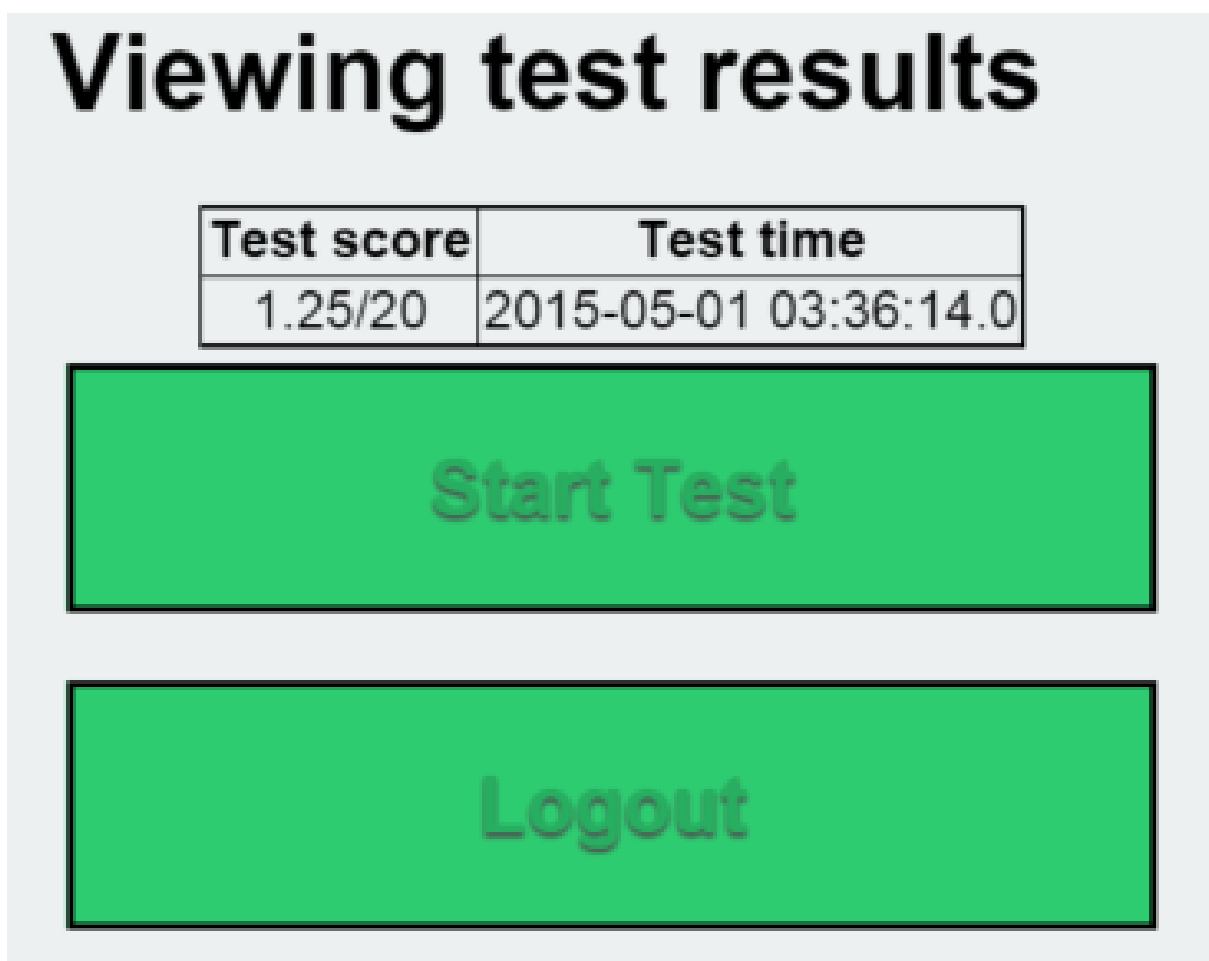
5.3   Admin
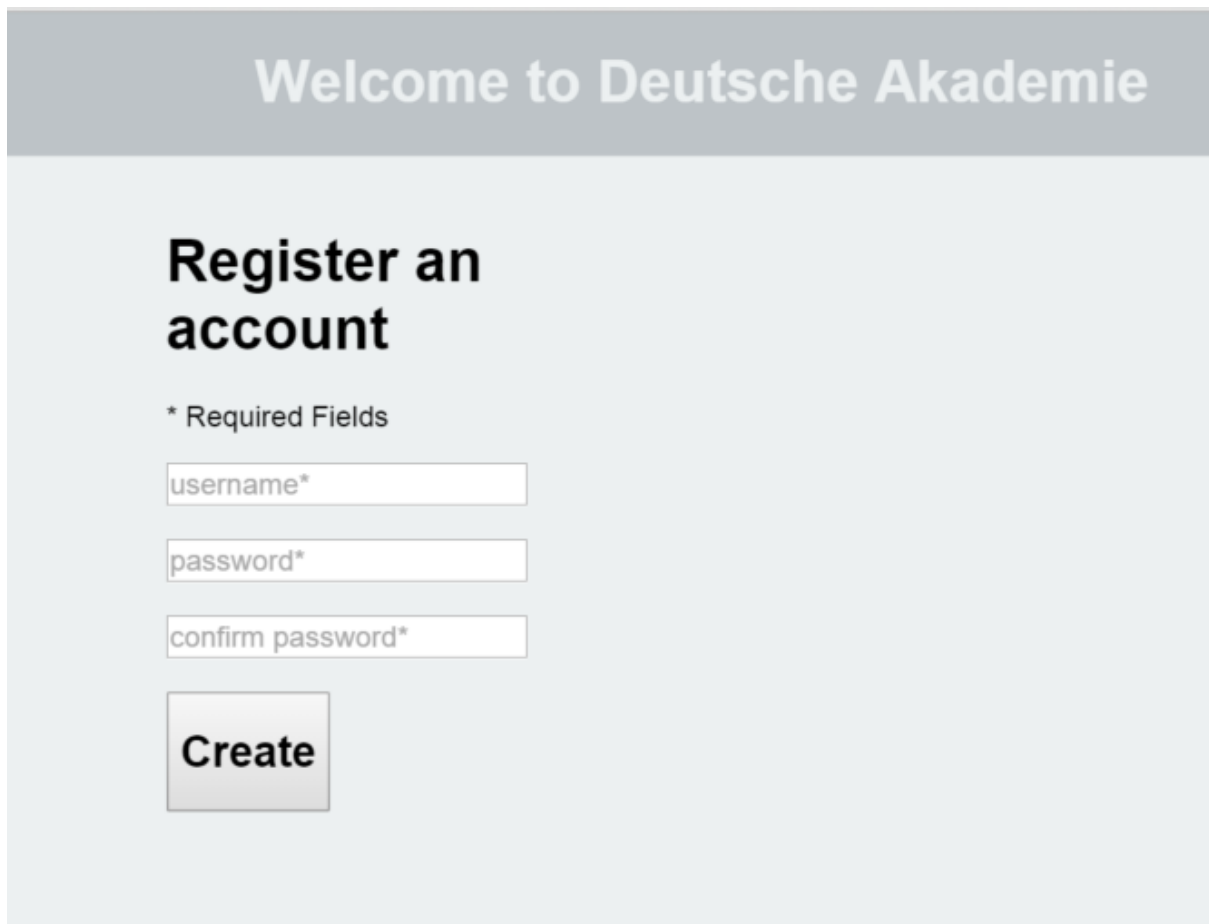
5.3.1   Login

After successful admin login this page will be displayed.
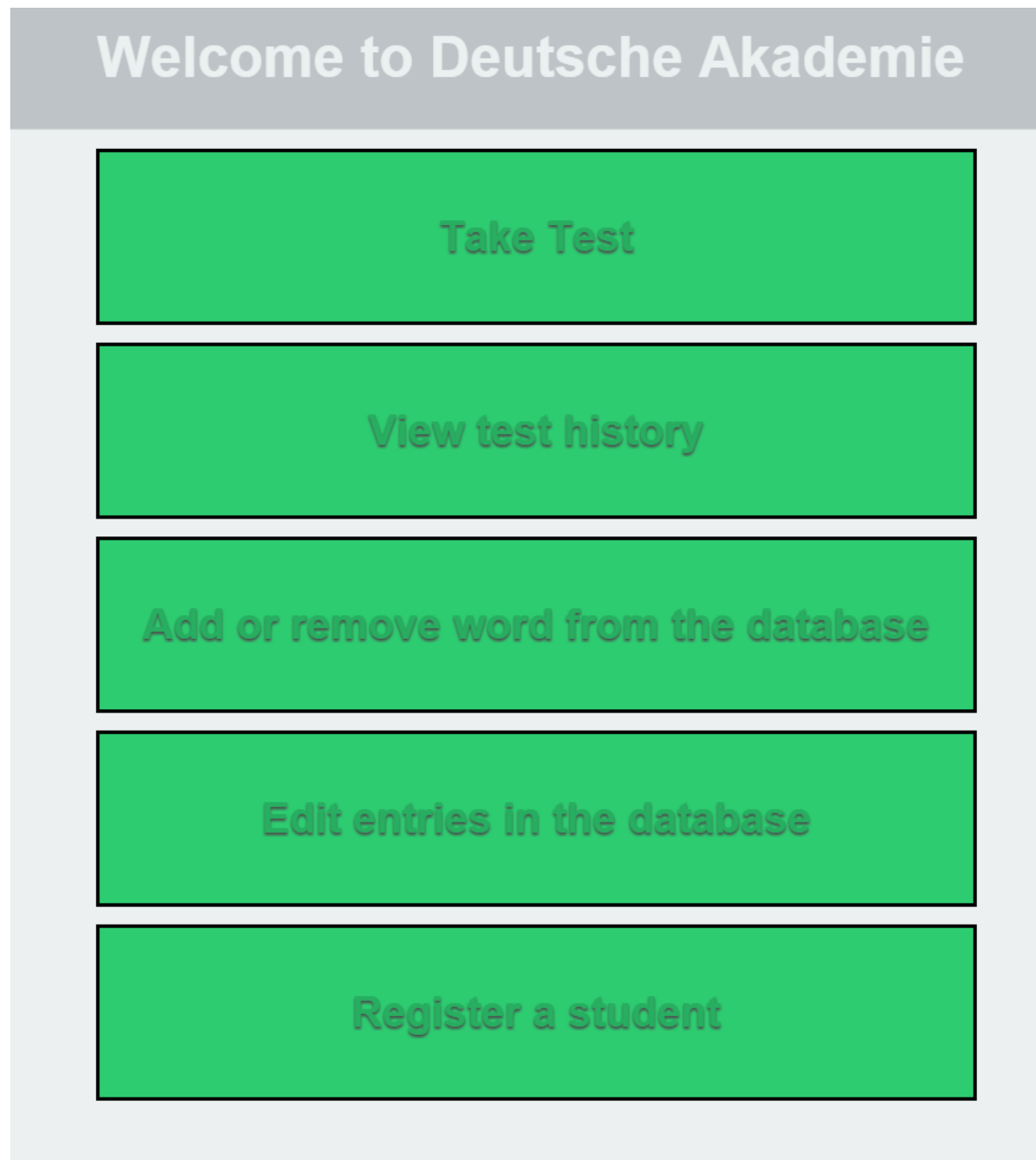
5.3.2 Add Student

To add a student the administrator should access the 'register a student' button, this will take them to a page where they can input a unique username and enter a password which has double validation.

If registration is unsuccessful this will be displayed.

Welcome to Deutsche Akademie

Registration failed

Please fill in all the required fields,
usernames need to be unique

* Required fields

username*

password*

confirm password*

Login

On successful registration this will be outputted.

Welcome to Deutsche Akademie

Student account created successfully

Home

And this change can be seen in the database table.

	account_id	account_name	account_password	account_status
▶	1	admin	thepassword	admin
	2	michael	thepassword	student
	3	huw	thepassword	student
	4	kieran	hello	student
	5	steve	hello	student
	8	somestudent	somepassword	student
	10	otherstudent	otherpassword	student
	11	yello	hello	student
	12	pink	hello	student
	13	nickcotton	a	student
	14	idcheck	hello	student
	15			student
	28	bob	bob	student

5.3.3   All Student Results

This allows the administrator to see the results of all the students scores that are stored in the results table. On the page below.

Viewing test results

Test score	Test time	Account ID
1.25/20	2015-05-01 02:40:26.0	1
0.25/20	2015-05-01 02:53:44.0	1
1.5/20	2015-05-01 03:21:40.0	1
1.5/20	2015-05-01 03:32:11.0	2
1.25/20	2015-05-01 03:36:14.0	3
1.25/20	2015-05-01 04:12:47.0	2
1.25/20	2015-05-01 04:16:56.0	2
1.25/20	2015-05-01 04:18:35.0	2
1.25/20	2015-05-01 04:18:56.0	2
1.25/20	2015-05-01 04:19:07.0	2
1.25/20	2015-05-01 04:19:39.0	2
1.25/20	2015-05-01 04:21:01.0	2
1.25/20	2015-05-01 04:21:02.0	2
1.25/20	2015-05-01 04:21:16.0	2
1.25/20	2015-05-01 04:21:22.0	2
1.25/20	2015-05-01 04:21:31.0	2
1.25/20	2015-05-01 04:21:45.0	2
1.25/20	2015-05-01 04:22:43.0	2
1.25/20	2015-05-01 04:22:49.0	2
1.25/20	2015-05-01 04:22:54.0	2
1.25/20	2015-05-01 04:23:09.0	2
1.25/20	2015-05-01 04:24:20.0	2
1.5/20	2015-05-01 04:25:43.0	2
1.5/20	2015-05-01 04:27:30.0	2
1/20	2015-05-01 04:59:02.0	2
0.75/20	2015-05-01 04:59:33.0	1
1/20	2015-05-01 06:12:25.0	1
0.5/20	2015-05-01 06:12:46.0	2
2.25/20	2015-05-01 07:05:16.0	2
1.5/20	2015-05-01 07:06:27.0	1
1.5/20	2015-05-01 07:06:55.0	1

Start Test

Logout

This is the result table in the database.

test_id	test_score	test_time	account_id
1	1.25	2015-05-01 02:40:26	1
2	0.25	2015-05-01 02:53:44	1
3	1.5	2015-05-01 03:21:40	1
4	1.5	2015-05-01 03:32:11	2
5	1.25	2015-05-01 03:36:14	3
6	1.25	2015-05-01 04:12:47	2
7	1.25	2015-05-01 04:16:56	2
8	1.25	2015-05-01 04:18:35	2
9	1.25	2015-05-01 04:18:56	2
10	1.25	2015-05-01 04:19:07	2
11	1.25	2015-05-01 04:19:39	2
12	1.25	2015-05-01 04:21:01	2
13	1.25	2015-05-01 04:21:02	2
14	1.25	2015-05-01 04:21:16	2

5.3.4   Add/Remove and Modify Words

Although these buttons are separate and take the administrator to pages with different functions they must both first decide which table they want to modify.
The choices are shown below

Add / Remove Words

This allows the addition and removal of words from the database.

Add a new word:			
german word	german word type	english word	add

Table: area_a_home_and_abroad			
German word	**Gender**	**English word**	
a	a	a	Delete
abschicken	null	to post	Delete
abschickena	null	to send	Delete
abschickena	null	to post	Delete
Aktivitäta	f	activity	Delete
ankommen	null	to arrive	Delete
Ankunft	f	arrival	Delete
anrufen	null	to ring	Delete
anrufen	null	to phone	Delete
anrufen	null	to give a call	Delete
arbeiten	null	to work	Delete
aufmachen	null	to open	Delete
aufschlagen	null	to pitch (tent)	Delete
Aufzugttt	m	liftaaa	Delete
Ausfahrt	f	exit	Delete
ausfüllen	null	to complete	Delete
ausfüllen	null	to fill in	Delete
Ausgang	m	way out	Delete
Ausgang	m	exit	Delete
ausgebucht	null	booked up	Delete
ausgebucht	null	fully booked	Delete
Ausland	n	foreign countries	Delete
Ausland	n	abroad	Delete
auspacken	null	to unpack	Delete
Aussicht	f	view	Delete
aussteigen	null	to get off	Delete
aussteigen	null	to alight	Delete
Ausweis	m	identity card	Delete
Auto	n	car	Delete
Autobahn	f	motorway	Delete
baden	null	to swim (in the sea)	Delete
Bahn	f	train	Delete

Finally in this section there is deletion/removal

DELETED: a

Add a new word:			
german word	german word type	english word	add

Table: area_a_home_and_abroad			
German word	**Gender**	**English word**	
abschicken	null	to post	Delete

Row added:

ADDED : NEIN m no

Add a new word:			
NEIN	m	no	add

Modify Word

Changes the content of a row that already exists in the table.

Table: area_b_education_and_employment			
German word	**Gender**	**English word**	
Abitur	n	equivalent to GCE A levels	Save
Abschlussprüfung	f	final exam	Save

An 'a' has been successfully added to the row in the German word column.

Word edited sucessfully

Table: area_b_education_and_employment			
German word	**Gender**	**English word**	
Abitura	n	equivalent to GCE A levels	Save

6   Evaluation

What went well

The generation of our tables and forms using the database was very efficient and only required one servlet and loop to generate everything, including the processing of the questions and calculating the answers.

The user interface design and styling is efficient and clean for the user, it has exactly and only exactly what is required for the user to see.

What didnt go well

We encounted a few slight bugs, one being a small Servlet redirect bug which we could not fix and the reasoning is rather bizzare, our assumption this is down to a maximum amount of redirects per servlet.

We had some conditions in our database queries which would come to the incorrect conclusion, for example if a word had multiple entires but different meanings, it would only except the first entry and meaning as the actual answer, even though there could possible be more.

What could be improved on

The problems above could easily be fixed with more time on the project, or approaching the project from a different angle and using different services such as an XML parser on the data rather than a database. The conditions for the database could of been fixed with more rigid if statements however they were proving hard to create passing variables for in the process we did. qwerrt