



**VILNIUS UNIVERSITY
ŠIAULIAI ACADEMY**

BACHELOR PROGRAMME SOFTWARE ENGINEERING

Final Project

student: Yezholov Kyrylo

Lecturer: Asist. dr. Dervinis Donatas

I. Introduction

Project Title: PHP OOP Password Management System.

Project Purpose: to create program page for PHP OOP passwords for generating and for storing in DB

GitHub URL: https://github.com/yezholov/PHP_FinalProject

II. System Architecture. UML and Database architecture

UML.

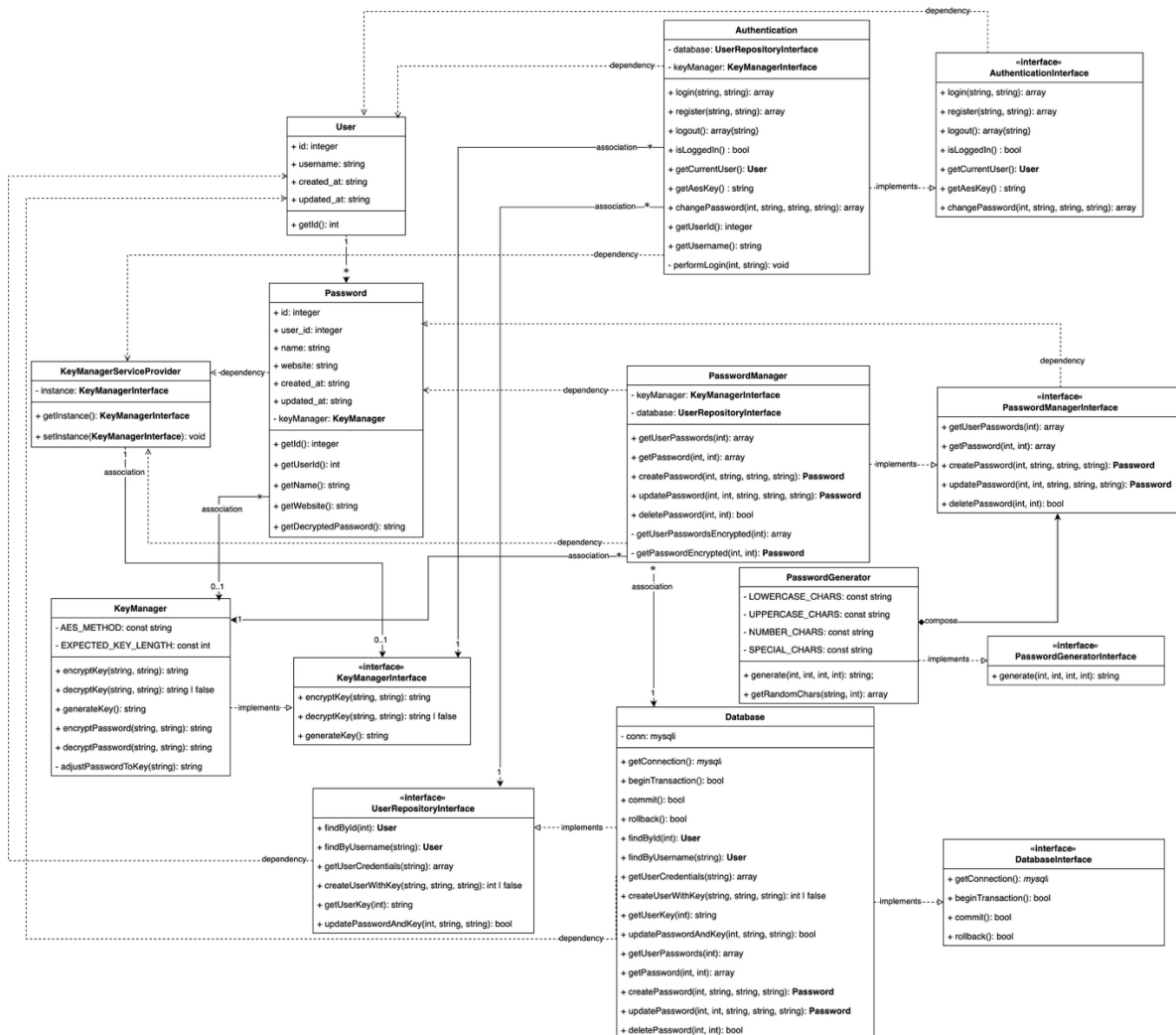


Fig. 1. UML Class Diagram

Database Schema.

The database dump (without data) is in the archive under the name "FinalProject_db.sql".

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int			No	None		AUTO_INCREMENT
2	username	varchar(255)	utf8mb4_unicode_ci		No	None		
3	password_hash	varchar(255)	utf8mb4_unicode_ci		No	None		
4	created_at	timestamp			Yes	CURRENT_TIMESTAMP		DEFAULT_GENERATED
5	updated_at	timestamp		on update CURRENT_TIMESTAMP	Yes	CURRENT_TIMESTAMP		DEFAULT_GENERATED ON UPDATE CURRENT_TIMESTAMP

Fig. 2. Structure of the users table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	user_id 🔑	int			No	None		
2	aes_key_encrypted	text	utf8mb4_unicode_ci		No	None		
3	created_at	timestamp			Yes	CURRENT_TIMESTAMP		DEFAULT_GENERATED

Fig. 3. Structure of the *user_keys* table.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id 🔑	int			No	None		AUTO_INCREMENT
2	user_id 🔑	int			No	None		
3	name 🔑	varchar(255)	utf8mb4_unicode_ci		No	None		
4	password_encrypted	text	utf8mb4_unicode_ci		No	None		
5	website	varchar(255)	utf8mb4_unicode_ci		Yes	NULL		
6	created_at	timestamp			Yes	CURRENT_TIMESTAMP		DEFAULT_GENERATED
7	updated_at	timestamp		on update CURRENT_TIMESTAMP	Yes	CURRENT_TIMESTAMP		DEFAULT_GENERATED ON UPDATE CURRENT_TIMESTAMP

Fig. 4. Structure of the *passwords* table.

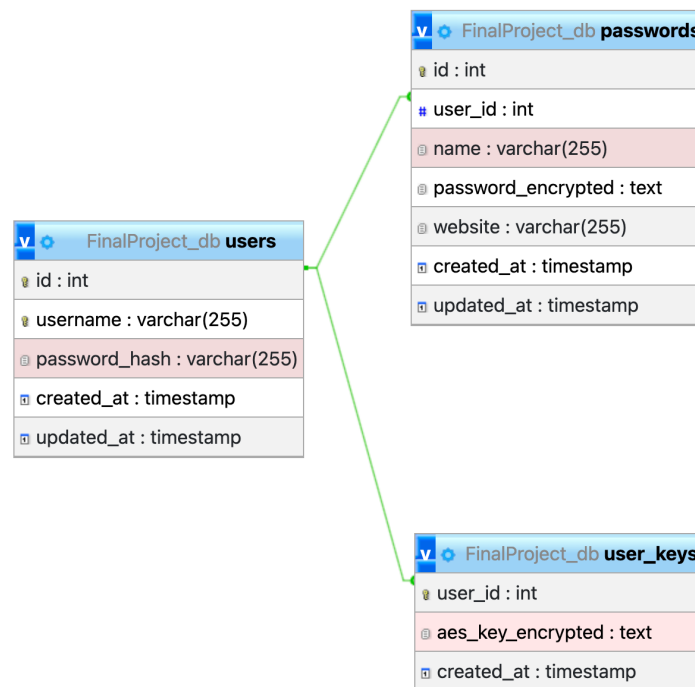
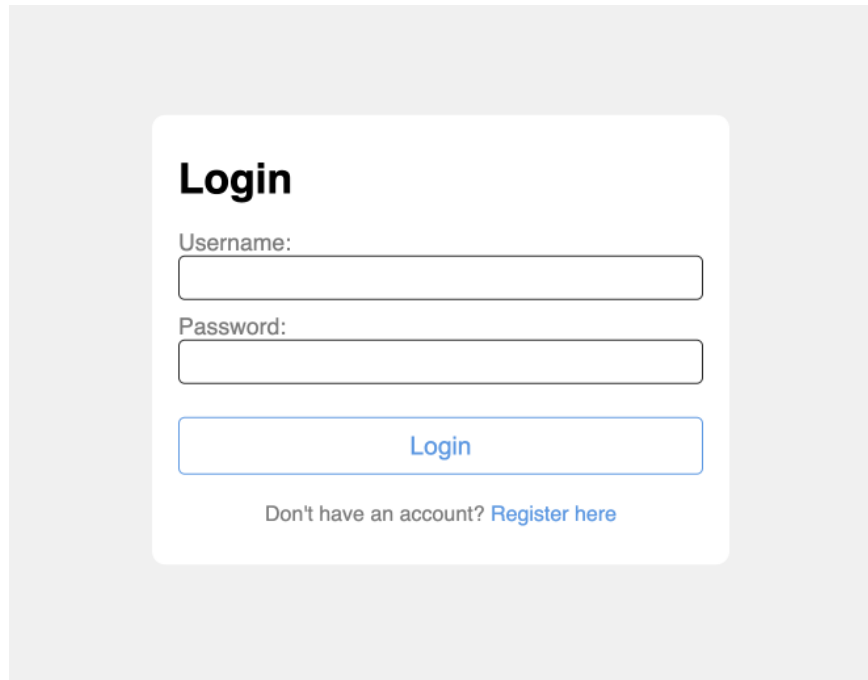


Fig. 5. *Designer* view in phpMyAdmin

III. Screenshots

1. User registration

A screenshot of a login form. The form is white with rounded corners and is centered on a light gray background. It has a title "Login" in bold black text. Below the title are two input fields: "Username:" and "Password:". Below the password field is a blue button with the text "Login". At the bottom of the form, there is a link that says "Don't have an account? Register here".

Login

Username:

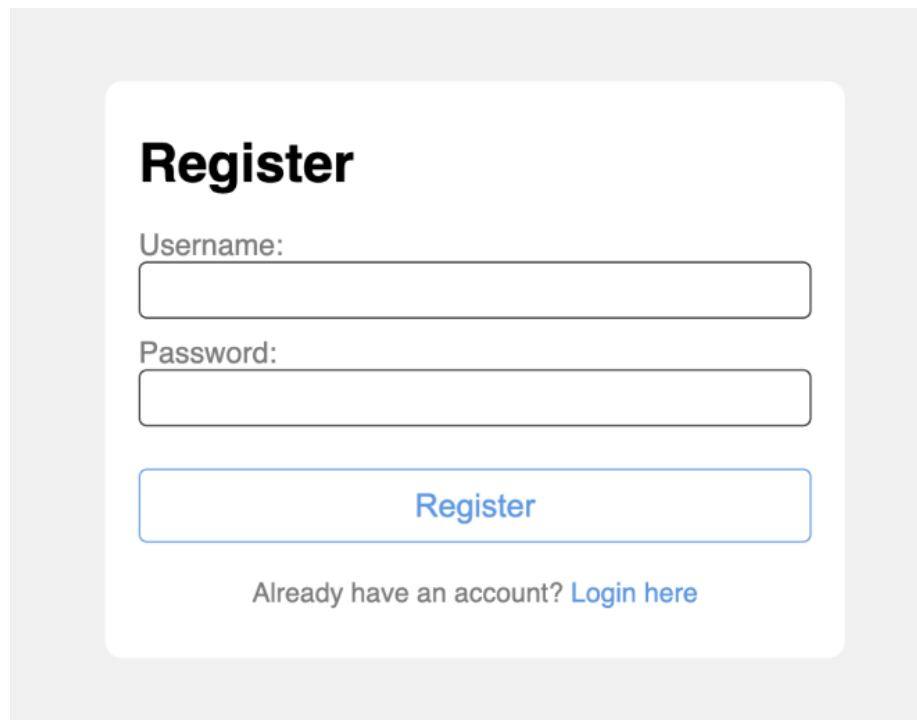
Password:

[Login](#)

Don't have an account? [Register here](#)

Fig. 6. Login Page

Since we don't have an account yet, we'll click on the "Register here" button to create one.

A screenshot of a registration form. The form is white with rounded corners and is centered on a light gray background. It has a title "Register" in bold black text. Below the title are two input fields: "Username:" and "Password:". Below the password field is a blue button with the text "Register". At the bottom of the form, there is a link that says "Already have an account? Login here".

Register

Username:

Password:

[Register](#)

Already have an account? [Login here](#)

Fig. 7. Registration page

Let's go ahead and create a user with the name *user*.

Once the user is created, we're taken to the dashboard, where we can see the 'Change password' and 'Logout' buttons in the top-right corner.

Hello **user!**

Change Password

Logout

Your Passwords

Add New Password

Name*

Website (optional)

https://example.com

Password (leave empty to generate)

Password Generator Options:

Expand more

Save Password

No passwords saved yet.

Fig. 8. Dashboard page.

Now, let’s look at

SELECT * FROM `users`;

	id	username	password_hash	created_at	updated_at
<input type="checkbox"/> Edit Copy Delete	6	user	\$2y\$10\$eZ9vHQEwTQgj9Fh1pl5zzu2u7l/pEBxx0cCOBee.7Cr...	2025-05-10 15:55:09	2025-05-10 16:12:37

SELECT * FROM `user_keys`;

	user_id	aes_key_encrypted	created_at
<input type="checkbox"/> Edit Copy Delete	6	KrwH4M738UFj6p6B2oR1MuFCfQEHS3c9Q+jRwza2NZA=	2025-05-10 15:55:09

database:

Showing rows 0 - 0 (1 total, Query took 0.0002 seconds.)

SELECT * FROM `users`;

	id	username	password_hash	created_at	updated_at
<input type="checkbox"/> Edit Copy Delete	6	user	\$2y\$10\$cZSNh95pE1x1rC3Hpa0wEO8xLdcTV3CsydVG5DBE0aq...	2025-05-10 15:55:09	2025-05-10 15:55:09

Check all

With selected:

[Edit](#)

[Copy](#)

[Delete](#)

[Export](#)

Showing rows 0 - 0 (1 total, Query took 0.0002 seconds.)

SELECT * FROM `user_keys`;

	user_id	aes_key_encrypted	created_at
<input type="checkbox"/> Edit Copy Delete	6	boxi4UmrPbOcJlblvJ0lKE+Euk08mw6iVcYAlqw+mco=	2025-05-10 15:55:09

Check all

With selected:

[Edit](#)

[Copy](#)

[Delete](#)

[Export](#)

Show all

Number of rows: 25

Filter rows: Search this table

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0002 seconds.)

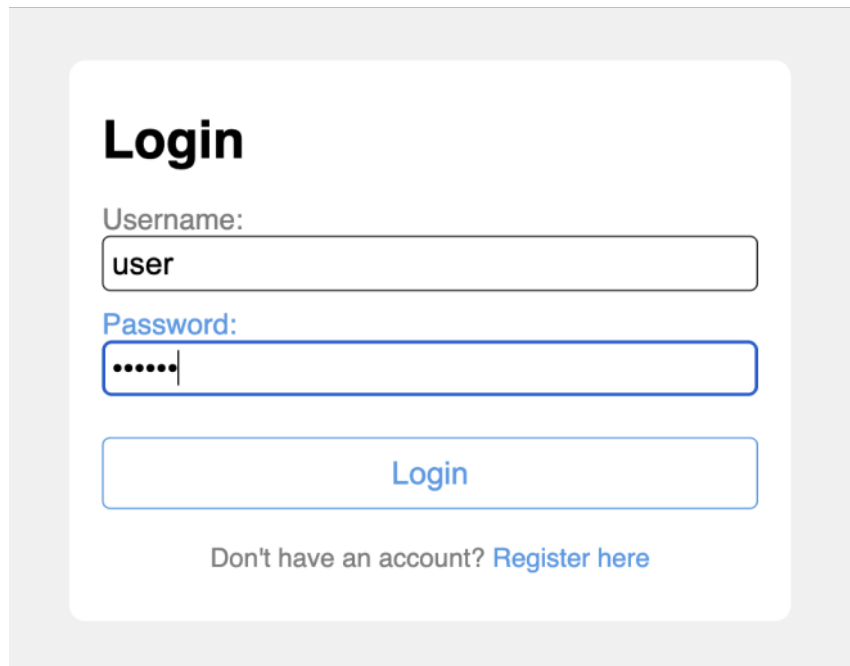
SELECT * FROM `passwords`;

id	user_id	name	password_encrypted	website	created_at	updated_at
----	---------	------	--------------------	---------	------------	------------

Fig. 9. Database after creation a user.

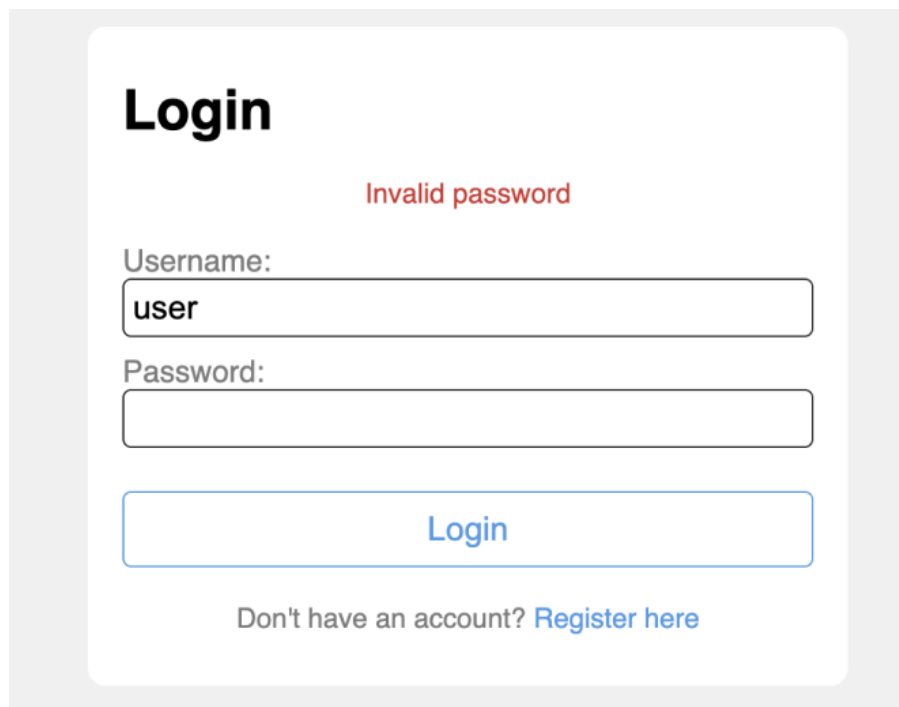
2. User login

After the user is created, we can try to log in again, but we will try to login with incorrect password.



The image shows a login form titled "Login". It has two input fields: "Username:" with the value "user" and "Password:" with masked characters ".....". Below the fields is a "Login" button. At the bottom, there is a link: "Don't have an account? [Register here](#)".

Fig. 10. Login with 'user' username with incorrect password



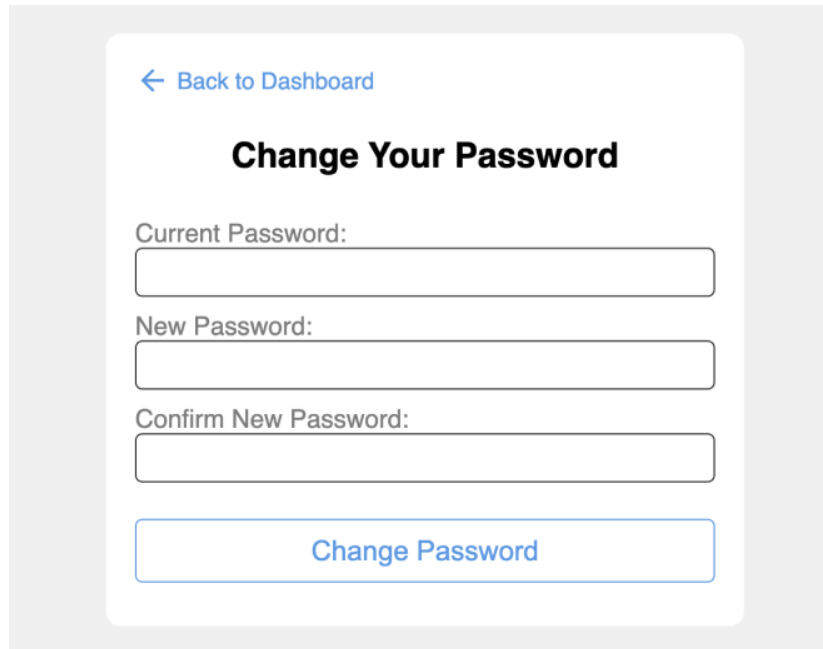
The image shows the same login form as Fig. 10, but with an error message "Invalid password" displayed in red text above the password field. The "Username:" field still contains "user", and the "Password:" field is now empty. The "Login" button and the "Register here" link remain at the bottom.

Fig. 11. Login with incorrect password.

We got error, so now we will try to login with correct password, and get Dashboard page(fig. 8)

3. Change password.

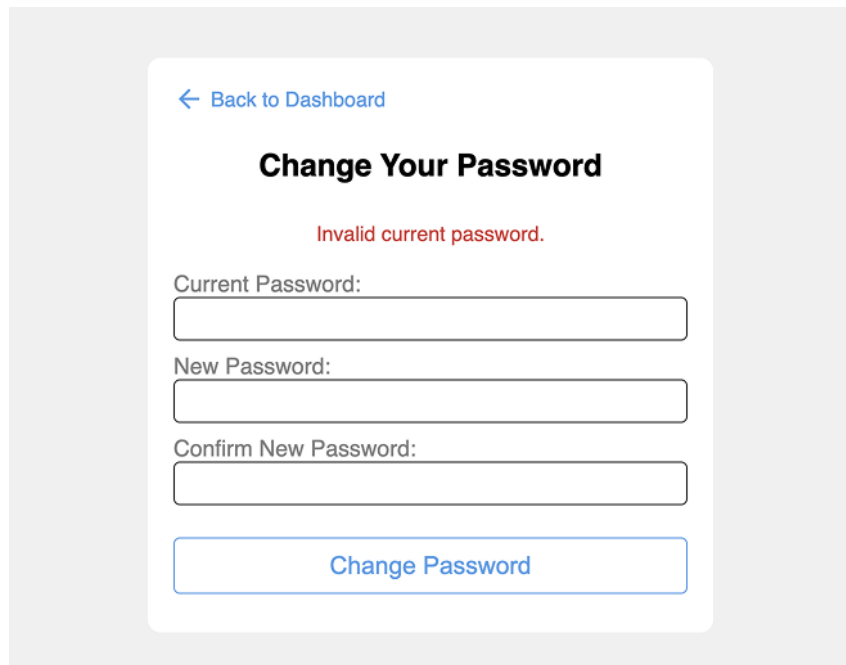
Look at fig. 8. We will try to change our user's password, let's click on "Change password".



A screenshot of a web form titled "Change Your Password". At the top left, there is a blue link with a left arrow icon labeled "Back to Dashboard". The title "Change Your Password" is centered in bold black text. Below the title are three input fields: "Current Password:", "New Password:", and "Confirm New Password:". Each field is a simple rectangular box. At the bottom of the form is a blue button with the text "Change Password".

Fig. 12. Change password page

Let's try to enter incorrect current password.



A screenshot of the same "Change Your Password" form as in Fig. 12, but with an error message. Below the title "Change Your Password", there is a red text message that says "Invalid current password.". The rest of the form, including the three input fields and the "Change Password" button, remains the same.

Fig. 13. Change password page. Wrong current password

Now let's enter right current password, but not the same new password.

← Back to Dashboard

Change Your Password

New passwords do not match.

Current Password:

New Password:

Confirm New Password:

Change Password

Fig. 14. Change password page. New passwords do not match.

Now we will fill it in correctly and try to change the password.

← Back to Dashboard

Change Your Password

Password changed successfully!

Current Password:

New Password:

Confirm New Password:

Change Password

Fig. 15. Change password page. Success

Now, let's look at database:

```
SELECT * FROM `users`;
```

	id	username	password_hash	created_at	updated_at
<input type="checkbox"/> Edit Copy Delete	6	user	\$2y\$10\$eZ9vHQEwTQgj9Fh1pl5zzu2u7l/pEBxx0cCOBee.7Cr...	2025-05-10 15:55:09	2025-05-10 16:12:37

```
SELECT * FROM `user_keys`;
```

	user_id	aes_key_encrypted	created_at
<input type="checkbox"/> Edit Copy Delete	6	KrwH4M738UFj6p6B2oR1MuFCfQEHS3c9Q+jRwza2NZA=	2025-05-10 15:55:09

Fig. 16. Database after changing password.

If we compare with fig. 9, the password hash has changed, and a new date has been written in *updated_at*. The encrypted *aes_key* has also changed.

4. Add password into password manager

Let's back to dashboard and try to create a new password into password manager.

Your Passwords

Add New Password

Name*

Google

Website (optional)

https://google.com/

Password (leave empty to generate)

Password Generator Options:

Expand less

The password generator will generate a password with the specified options. Enter the number of each character you want to generate.

Uppercase:

3

Lowercase:

2

Numbers:

5

Special:

2

Save Password

No passwords saved yet.

Fig. 17. Create a new password with auto-generated password

Your Passwords

Add New Password

Name*

Website (optional)

https://example.com

Password (leave empty to generate)

Password Generator Options:

Expand more

Save Password

Name	Website	Password	Actions
Google	https://google.com/	6:4aU20H1iL	<div>EditDelete</div>

Fig. 18. Result of creation a new password with auto-generated password

SELECT * FROM `passwords`;

id	user_id	name	password_encrypted	website	created_at	updated_at
12	6	Google	sw/XVLnvDUa8jMpDIRfC8Q==	https://google.com/	2025-05-10 16:21:05	2025-05-10 16:21:05

Fig. 19. New password into Database, with encrypted password

Now let's create a new password without website, and with manual password entry.

Your Passwords

Add New Password

Name*

Moodle

Website (optional)

https://example.com

Password (leave empty to generate)

ourPassword

Password Generator Options:

Expand more

Save Password

Name	Website	Password	Actions
Google	https://google.com/	6:4aU20H1iL	<div>EditDelete</div>

Fig. 20. Create a new password with manual password

Your Passwords

Add New Password

Name*

Website (optional)

https://example.com

Password (leave empty to generate)

Password Generator Options:

Expand more

Save Password

Name	Website	Password	Actions
Google	https://google.com/	6:4aU20H1iL	<div>EditDelete</div>
Moodle		ourPassword	<div>EditDelete</div>

Fig. 21. Result of creation a new password with manual password

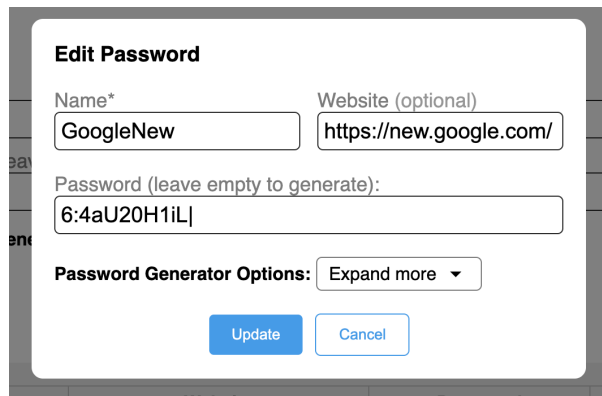
```
SELECT * FROM `passwords`;
```

id	user_id	name	password_encrypted	website	created_at	updated_at
12	6	Google	sw/XVLnvDUa8jMpDIRfC8Q==	https://google.com/	2025-05-10 16:21:05	2025-05-10 16:21:05
13	6	Moodle	sPboAulfwYS1kZOblJdCuw==		2025-05-10 16:24:51	2025-05-10 16:24:51

Fig. 22. Password into Database, with encrypted password.

5. Update password in password manager

Let's change the name and site for our first password (Google).



Edit Password

Name* Website (optional)

Password (leave empty to generate):

Password Generator Options:

Fig. 26. Changing the name and website of one of the passwords.

Name	Website	Password	Actions	
GoogleNew	https://new.google.com/	6:4aU20H1iL	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
Moodle		ourPassword	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
X (Twitter)	https://x.com	ITR5a8D?Wf	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

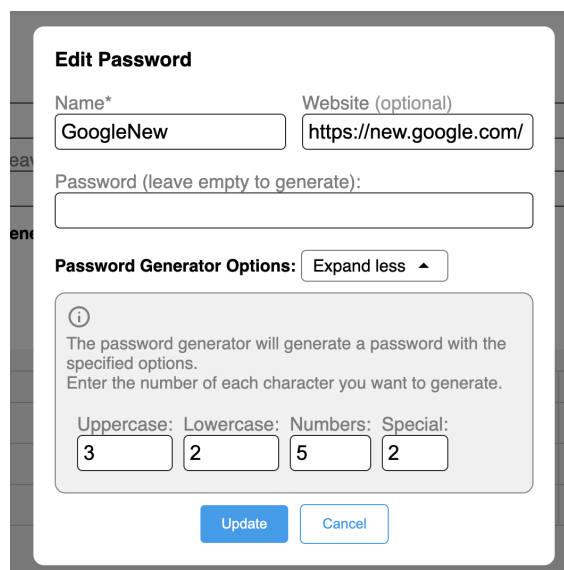
Fig. 27. New name and website for first password (ex. Google)

Now let's try to change the password for this same password to our own.

Name	Website	Password	Actions	
GoogleNew	https://new.google.com/	newgooglepassword	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
Moodle		ourPassword	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
X (Twitter)	https://x.com	ITR5a8D?Wf	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

Fig. 28. Manual password for first password

Now let's try to change the password to auto-generation for the same password.



Edit Password

Name* Website (optional)

Password (leave empty to generate):

Password Generator Options:

The password generator will generate a password with the specified options. Enter the number of each character you want to generate.

Uppercase: Lowercase: Numbers: Special:

Fig. 29. Update password with auto-generator

Name	Website	Password	Actions	
GoogleNew	https://new.google.com/	0 432ZsD0i[C	Edit	Delete
Moodle		ourPassword	Edit	Delete
X (Twitter)	https://x.com	ITR5a8D?Wf	Edit	Delete

Fig. 30. New auto-generated password (GoogleNew)

As we can see, everything turned out successfully and our passwords are displayed.

6. Delete password in password manager

Now we will try to delete the first password.

Name	Website	Password	Actions	
Moodle		ourPassword	Edit	Delete
X (Twitter)	https://x.com	ITR5a8D?Wf	Edit	Delete

Fig. 31. Password Manager after clicked on Delete on first password (GoogleNew)

We have successfully removed the password

IV. Conclusion

The developed PHP OOP Password Management System effectively addresses the need for secure password generation and storage. Through careful implementation of user authentication, AES key encryption, and intuitive password management features, the project successfully achieves its intended goals.