

# PROJECT REPORT



## CP Learning & Web Design

CP School, a place of learning and delight,  
Where algorithms and code take flight.

**MAY  
2025**

Prepared by  
**Aukkhar  
Tamim  
Shafayat  
Imran**

Prepared for  
**Md. Moradul Siddique  
Lecturer, UITS**

**Ms. Tania Akter Setu  
Assistant Professor,  
UTS**

# Table of Contents

---

**01** Title

---

**02** Introduction

---

**03** Objectives

---

**04** Features

---

**05** Used Technology

---

**06** ER Diagram

---

**07** Schema Diagram

---

**08** Screenshot of Features

---

**09** Conclusion

---

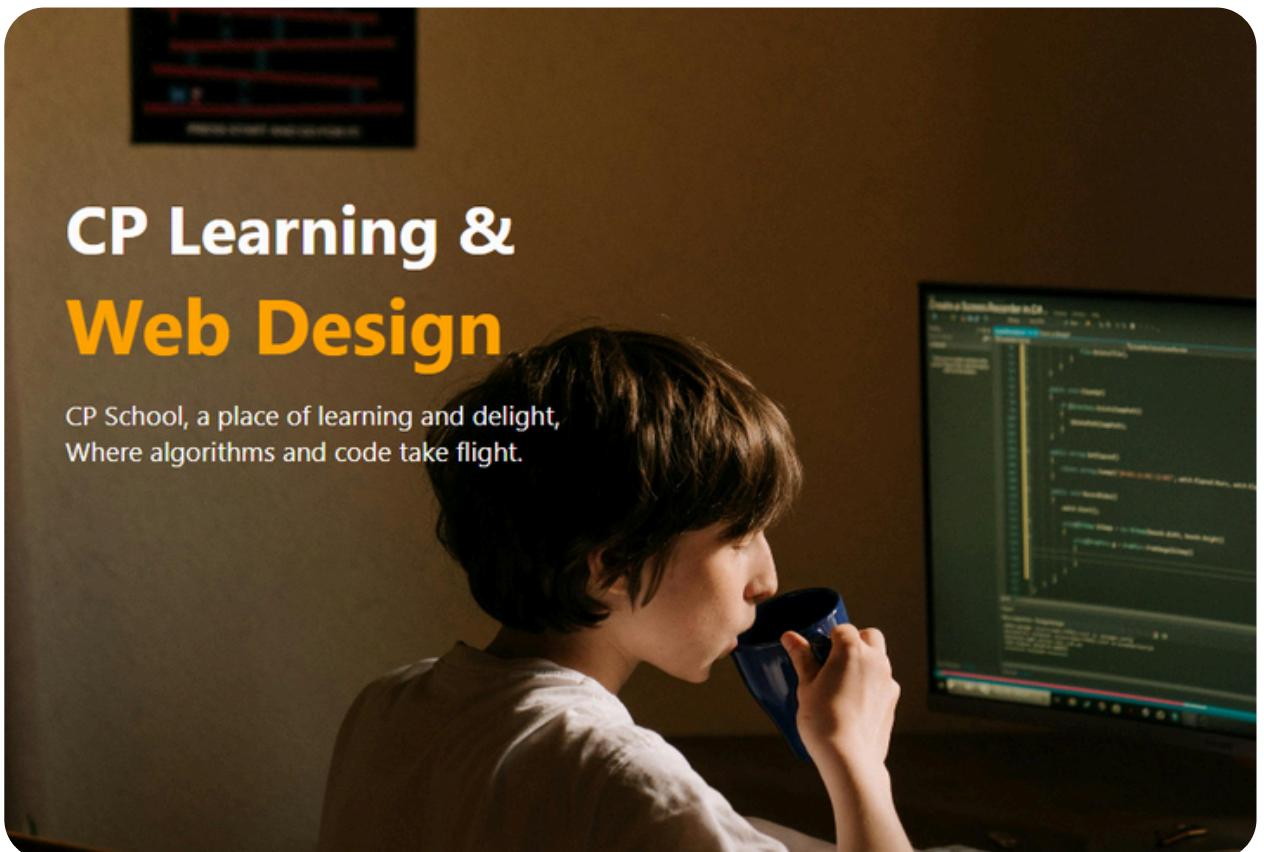
**10** Thank You

---

# CP School

**A Database-Driven Platform for Competitive Programming Education.**

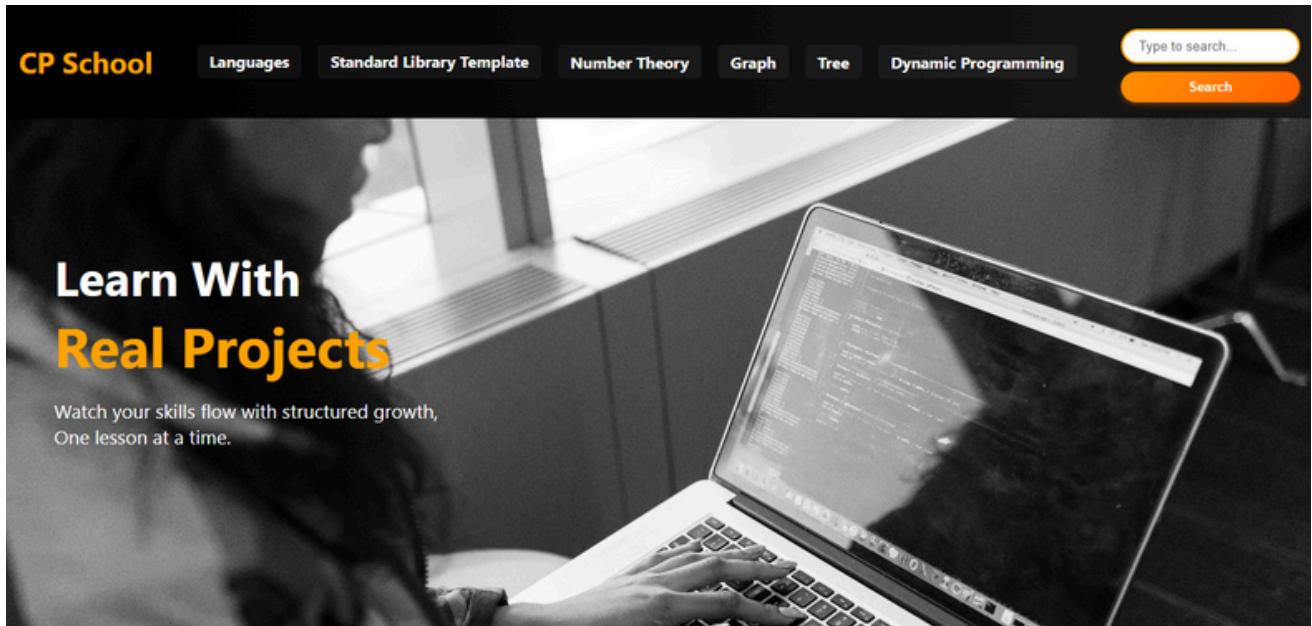
**Created By**  
Team T<sup>2</sup>SI



## CP Learning & Web Design

CP School, a place of learning and delight,  
Where algorithms and code take flight.

# Introduction



## Project Overview

CP School is a web-based learning platform developed as a course project for CSE 316 – Database Management System. It focuses on teaching key competitive programming topics like Graphs, DP, Trees, Number Theory, and STL through structured content, quizzes, and problem-solving exercises. Designed for learners of all levels, the platform combines programming education with practical database management skills, offering an interactive and efficient way to learn and track progress.

## Technical and Educational Significance

CP School demonstrates the real-world use of relational databases in educational platforms. It uses a structured schema to manage users, content, quizzes, and progress tracking through core DBMS concepts like tables, keys, and SQL operations. This project highlights the team's ability to apply database theory in practice while building a functional and user-friendly learning tool for competitive programming.

# Objectives

The primary objectives of the CP School project are as follows:

- To design and implement a structured, database-driven web platform focused on enhancing competitive programming skills.
- To apply core principles of relational database management, including normalization, entity relationships, and SQL operations, within a real-world educational context.
- To develop a scalable system that efficiently handles user data, course content, assessments, and performance tracking.
- To provide an interactive learning environment through quizzes, topic-based modules, and coding exercises tailored to programming fundamentals and advanced algorithms.
- To demonstrate integration of front-end technologies with a robust back-end and relational database, reflecting full-stack development practices.
- To encourage self-directed learning and continual skill development in programming through a user-friendly and engaging platform.

The screenshot shows a dark-themed website for 'CP School'. At the top, there is a navigation bar with links: 'CP School', 'Introduction', 'Why Number Theory?', 'Key Topics', 'Course Video', 'Practice Problems', 'Quiz', and 'More Videos'. Below the navigation bar, the main content area has a dark background with white text. The title 'What You'll Learn' is centered at the top of this section. Below the title is a list of ten topics, each preceded by a small white circle.

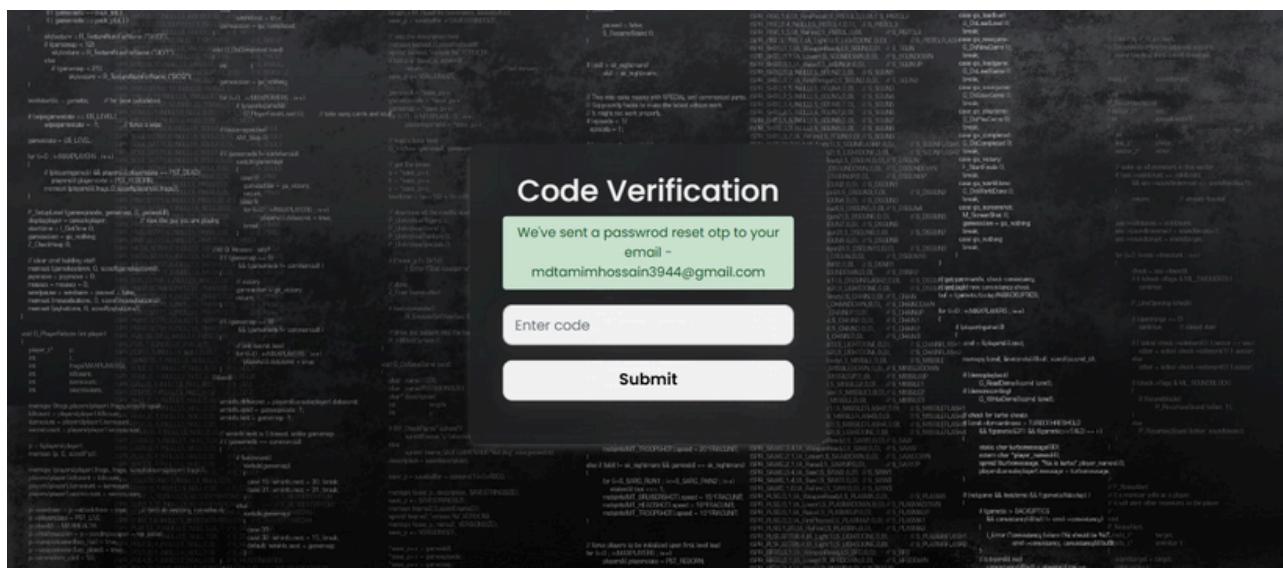
**What You'll Learn**

- Prime Numbers and Primality Testing
- Sieve of Eratosthenes and Segmented Sieve
- Greatest Common Divisor (GCD) and Euclid's Algorithm
- Modular Arithmetic and Modular Inverse
- Binary Exponentiation
- Prime Factorization
- Euler's Totient Function
- Chinese Remainder Theorem
- Applications in Cryptography and Competitive Programming

# Features

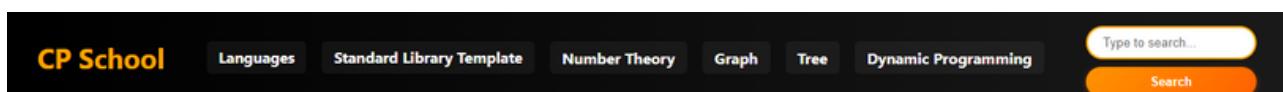
## User Registration and Authentication

- Sign-up: New users can create an account by providing their name, email, and password.
- Login: Registered users can securely log in to access personalized content.
- Password Reset: Users can reset their passwords via a secure recovery process.
- Session Management: Keeps users logged in during active sessions, enhancing usability.



## Interactive Learning Modules

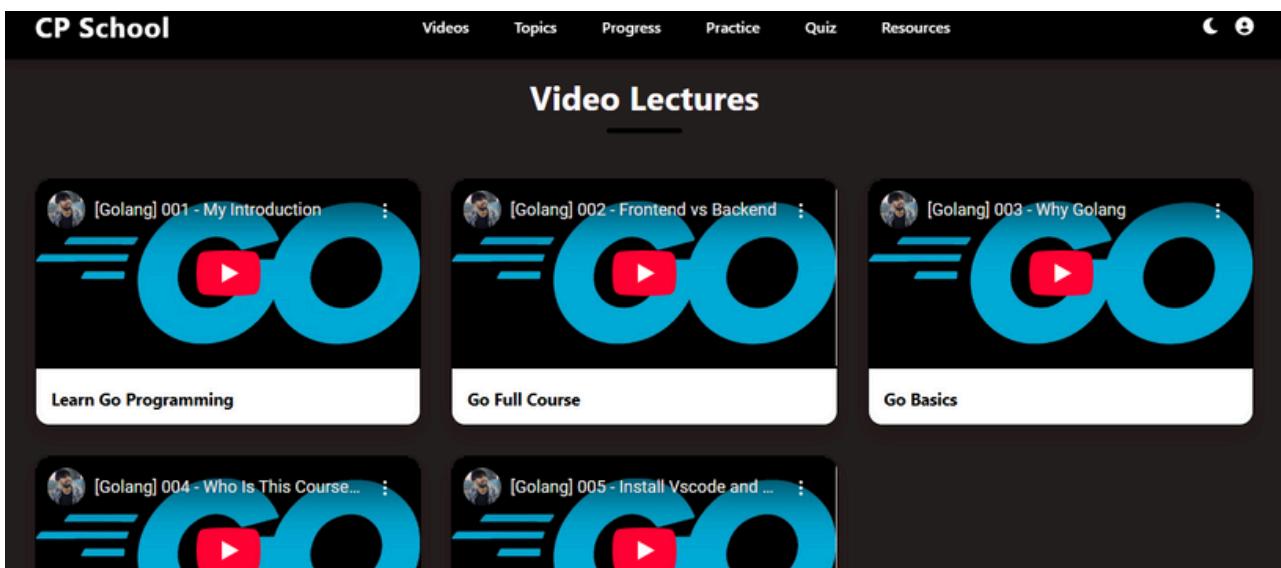
- Well-organized, topic-based content.
- Covers essential competitive programming areas:
- Graph Theory
- Dynamic Programming
- Trees
- Number Theory
- Standard Template Library (STL)



# Features

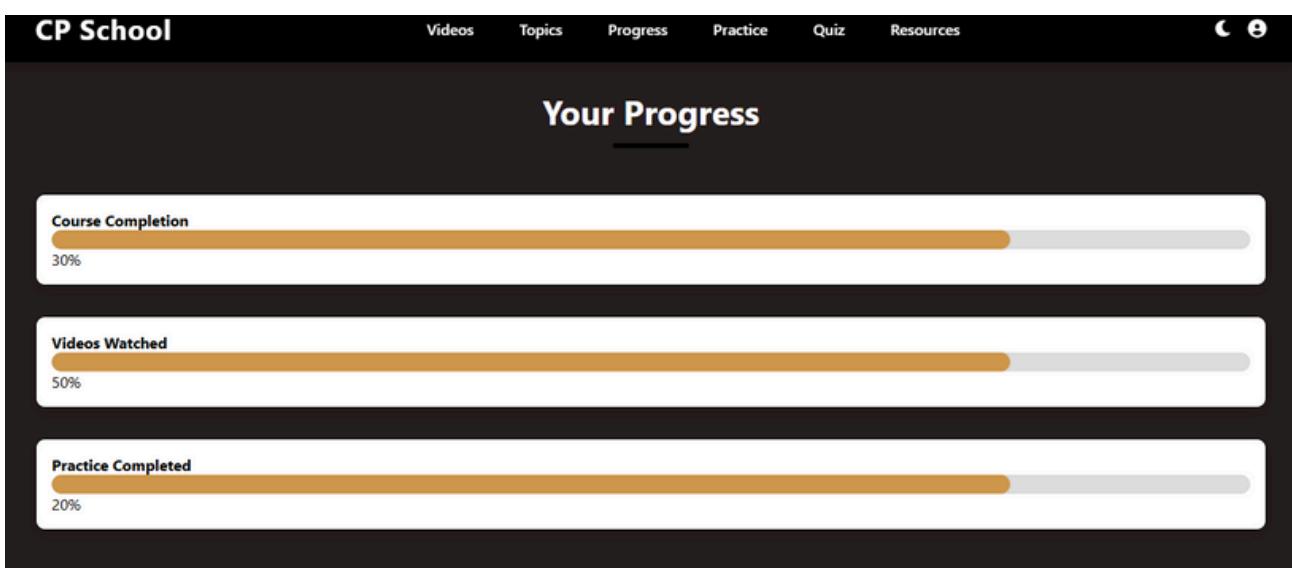
## Video Learning Section

- Embedded videos for each topic to provide visual and practical explanations.
- Supports varied learning styles and enhances concept understanding.



## Progress Tracking

- Real-time monitoring of completed lessons and quiz scores.
- Utilizes a relational database to store and update progress.



# Features

## Topic-Based Quizzes

- Quizzes integrated into each learning module.
- Designed to test user understanding and reinforce concepts.
- Provides immediate feedback on quiz performance.

**CP School**

Videos Topics Progress Practice Quiz Resources

**Fun Quiz**

**Question:** What does this Go code print?

```
package main
import "fmt"

func main() {
    a := []int{1, 2, 3}
    fmt.Println(a[1:])
}
```

[1]  
 [2 3]  
 [1 2 3]  
 Error

Submit Answer

Correct! Well done.

## Search & Navigation

- Users can quickly search for specific topics or problems.
- Improves learning efficiency and ease of use.

**CP School**

Languages Standard Library Template Number Theory Graph Tree Dynamic Programming

CP Learning 8!

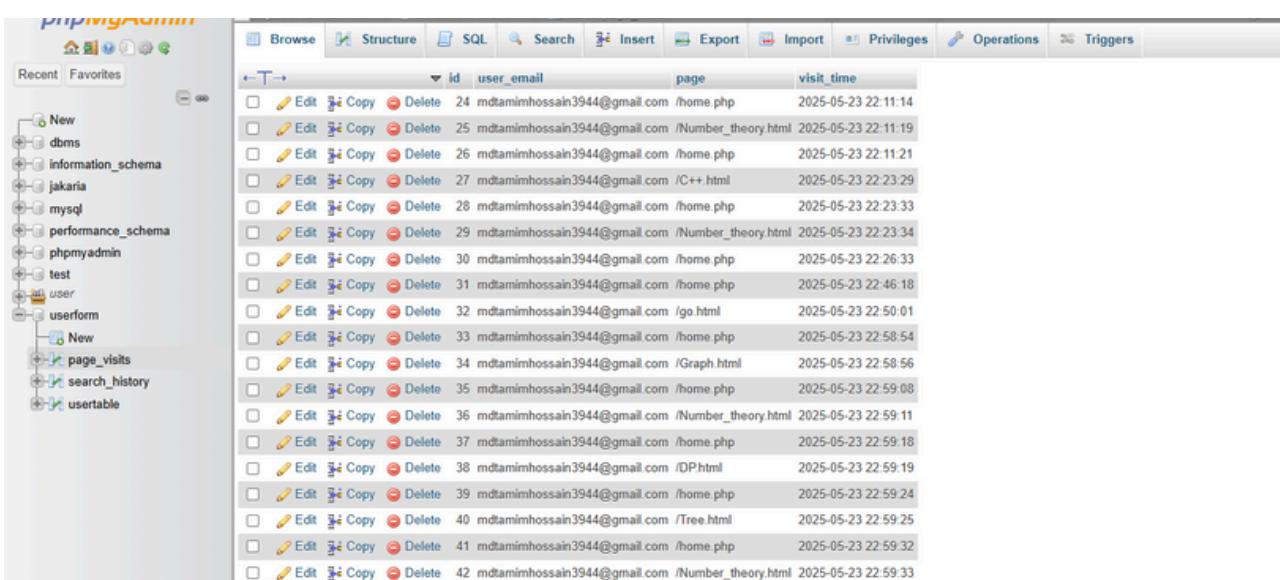
D  
Search

Standard Library Template  
Introduction  
Dynamic Programming

# Features

## Relational Database Integration

- Normalized schema for efficient data management.
- Tracks users, content, scores, search history, and page visits.
- Supports real-time progress tracking and personalized learning.

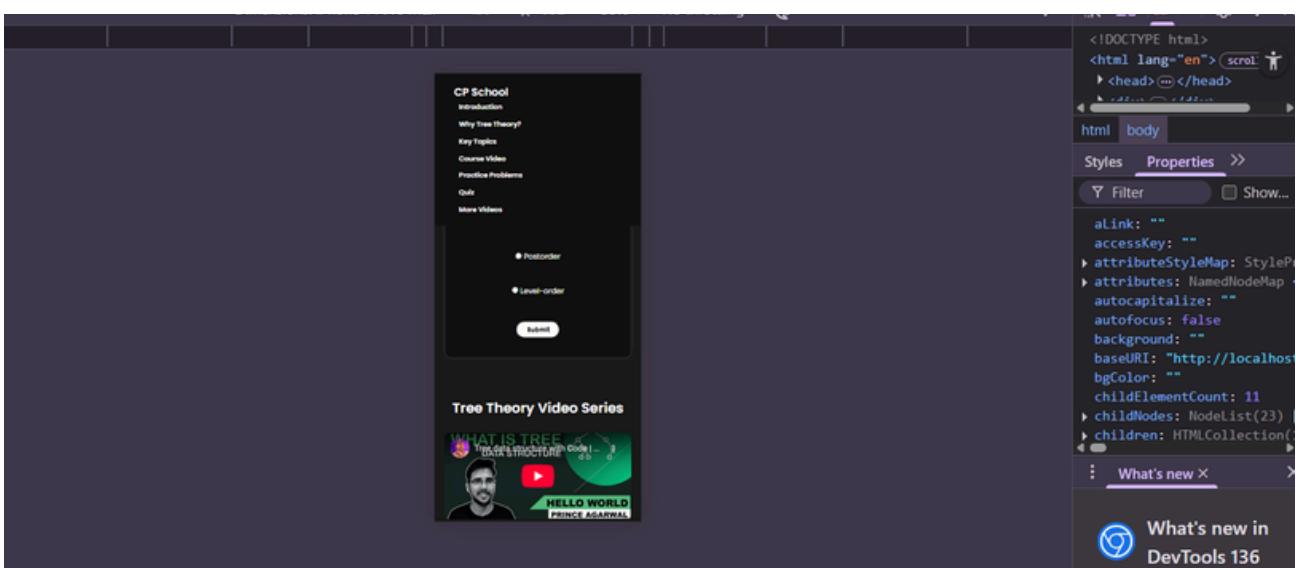


The screenshot shows the MySQL Workbench interface. On the left, there's a tree view of databases: New, dbms, information\_schema, jakaria, mysql, performance\_schema, phpmyadmin, test, user, and userform. Under userform, there are tables: New, page\_visits, search\_history, and userstable. The main pane displays a table with columns: id, user\_email, page, and visit\_time. The table contains 42 rows of data, each representing a user visit to a specific page at a specific time. The data includes various URLs like /home.php, /Number\_theory.html, and /C++.html.

	<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	id	user_email	page	visit_time
					24	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:11:14
					25	mdtamimhossain3944@gmail.com	/Number_theory.html	2025-05-23 22:11:19
					26	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:11:21
					27	mdtamimhossain3944@gmail.com	/C++.html	2025-05-23 22:23:29
					28	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:23:33
					29	mdtamimhossain3944@gmail.com	/Number_theory.html	2025-05-23 22:23:34
					30	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:26:33
					31	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:46:18
					32	mdtamimhossain3944@gmail.com	/go.html	2025-05-23 22:50:01
					33	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:58:54
					34	mdtamimhossain3944@gmail.com	/Graph.html	2025-05-23 22:58:56
					35	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:59:08
					36	mdtamimhossain3944@gmail.com	/Number_theory.html	2025-05-23 22:59:11
					37	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:59:18
					38	mdtamimhossain3944@gmail.com	/DP.html	2025-05-23 22:59:19
					39	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:59:24
					40	mdtamimhossain3944@gmail.com	/Tree.html	2025-05-23 22:59:25
					41	mdtamimhossain3944@gmail.com	/home.php	2025-05-23 22:59:32
					42	mdtamimhossain3944@gmail.com	/Number_theory.html	2025-05-23 22:59:33

## Responsive Web Interface

- Clean, intuitive design.
- Adapts seamlessly to various devices including desktops, tablets, and smartphones.



# Used Technology

## Frontend

- HTML5, CSS3, JavaScript for building responsive and interactive user interfaces
- AI tools to assist with responsiveness and UI enhancements

## Backend

- PHP for server-side scripting and handling application logic
- XAMPP as the local server environment (Apache and MySQL)

## Database

- MySQL for managing relational data efficiently
- Normalized database schema to organize users, search history, and page visits

## Design & Modeling

- EdrawMax was used to create detailed ER diagrams, visually representing entities, attributes, and relationships within the database.
- dbdiagram.io was utilized for designing and visualizing the database schema, helping to define table structures, keys, and relationships clearly.

## Learning Resources

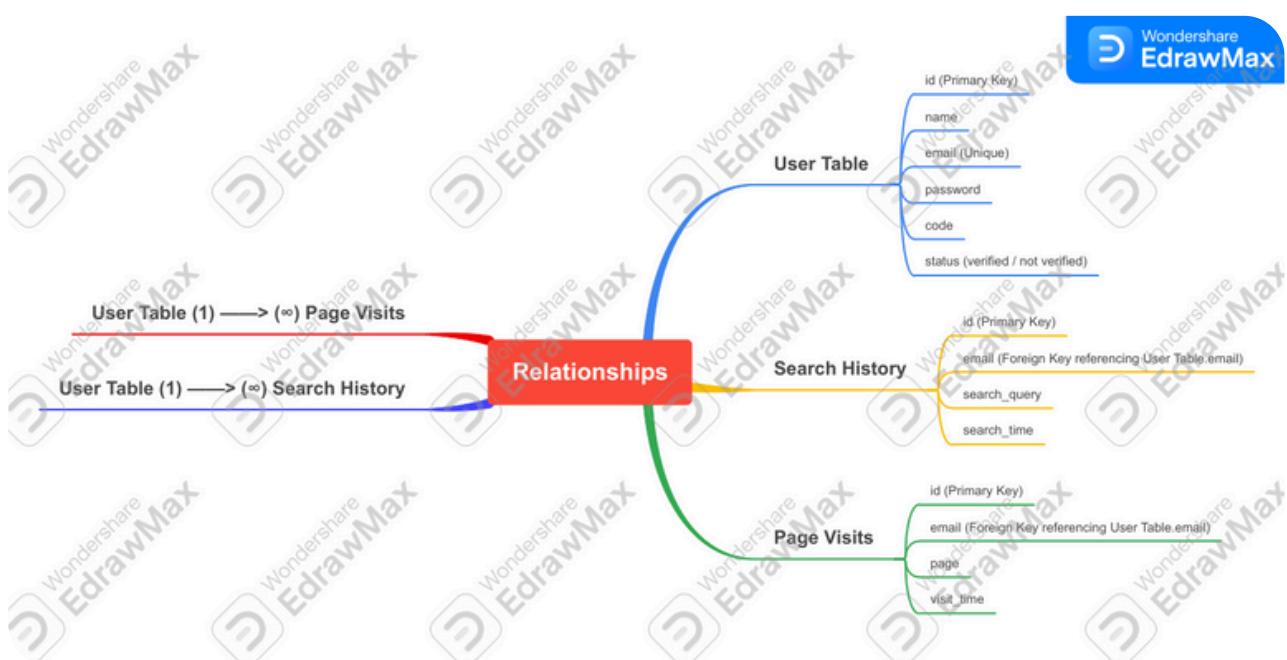
- Online tutorials and resources for continuous development and troubleshooting

## Dev Environment

- Visual Studio Code as the primary code editor for writing and debugging code

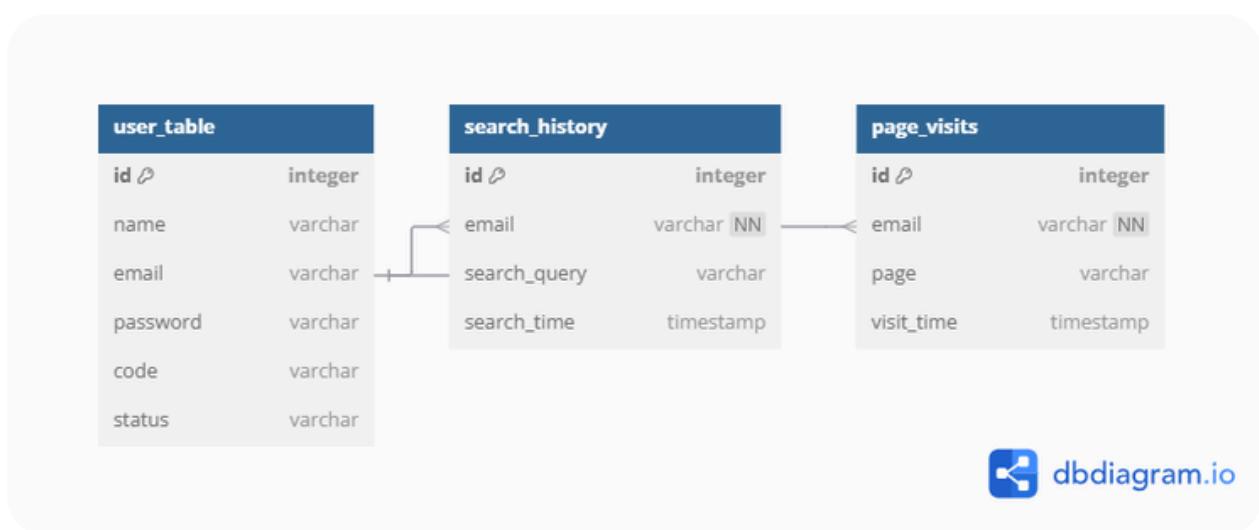
# ER Diagram

The Entity-Relationship (ER) diagram for the project was created using EdrawMax. It visually represents the database structure, including tables, attributes, and relationships between the entities such as UserTable, Search\_History, and Page\_Visits. The diagram helps in understanding how data is organized and interconnected, illustrating primary keys, foreign keys, and the nature of relationships (one-to-many) between the user and their activities like searches and page visits. This clear visualization aids in database design, ensuring data integrity and efficient query performance throughout the application.



# Schema Diagram

The database schema diagram for the project was designed using dbdiagram.io. It clearly defines the structure of the database tables, including columns, data types, primary keys, and foreign key constraints. The schema diagram illustrates how tables such as UserTable, Search\_History, and Page\_Visits are related, emphasizing data normalization and referential integrity. This visualization ensures a well-organized database design that supports efficient data storage and retrieval, making it easier to maintain and scale the application.



# Screenshots

## UserTable

This table stores essential user information for the CP School platform. It includes unique user IDs, names, email addresses, encrypted passwords, verification status, and any assigned codes. This data is securely stored in the database and is used to authenticate users, track their progress, and personalize their learning experience.

The screenshot shows the phpMyAdmin interface for the 'userform' database. The left sidebar shows tables like 'New', 'dbmns', 'information\_schema', 'jakaria', 'mysql', 'performance\_schema', 'phpmyadmin', 'test', 'user', 'userform', 'page\_visits', 'search\_history', and 'userstable'. The main area displays the 'userstable' data with the following columns: id, name, email, password, code, and status. Two rows are shown:

id	name	email	password	code	status
0	Tamim	tamimhossain3944@gmail.com	\$2y\$10\$NjGIVm0PA4MazalgQrl7OQpJkMzsTKz1rIPhiVNPF...	0	verified
0	Tamim	mdtamimhossain3944@gmail.com	\$2y\$10\$1EQOxq2SzUFhp7RZ/KlyWTZD7AQATHMuizdb04D8V...	0	verified

## Page Visits Table

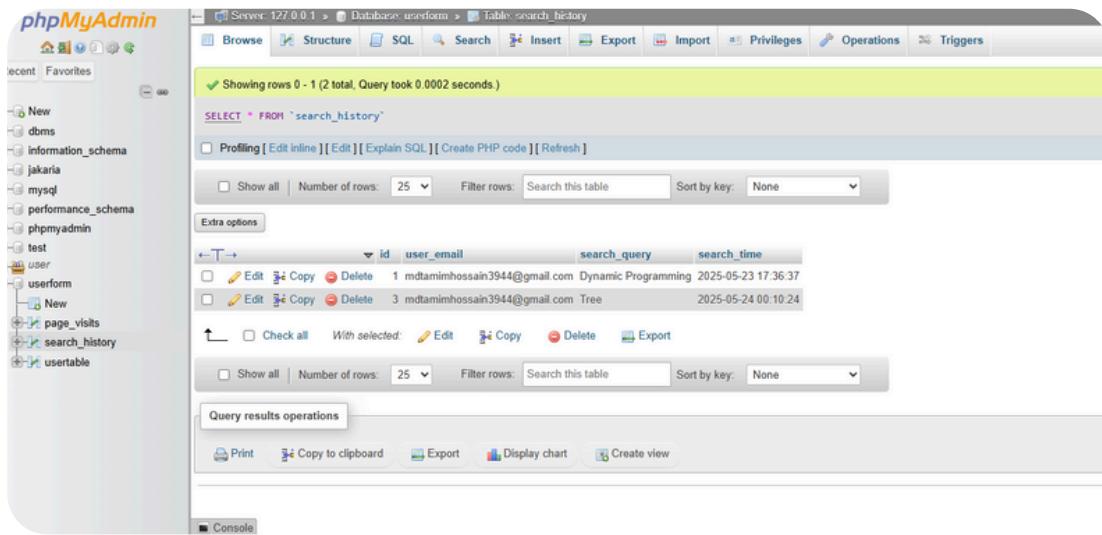
This table records every page visit made by users on the platform. It stores the user's email, the specific page they visited, and the exact time of the visit. This information helps track user activity and behavior, enabling analysis of popular content and improving user experience.

The screenshot shows the phpMyAdmin interface for the 'userform' database. The left sidebar shows tables like 'New', 'dbmns', 'information\_schema', 'jakaria', 'mysql', 'performance\_schema', 'phpmyadmin', 'test', 'user', 'userform', 'page\_visits', 'search\_history', and 'userstable'. The main area displays the 'page\_visits' data with the following columns: id, user\_email, page, and visit\_time. Numerous rows are listed, showing visits from the same user (mdtamimhossain3944@gmail.com) to various pages like /home.php, /Number\_theory.html, and /Graph.html at different times.

# Screenshots

## Search History Table

This table logs all the search queries made by users, along with the user's email and the time of each search. It helps in understanding user interests and frequently searched topics, which can be used to improve content relevance and personalize the learning experience.



The screenshot shows the phpMyAdmin interface for a MySQL database named 'userform'. The left sidebar lists various databases and tables, including 'search\_history'. The main area displays the contents of the 'search\_history' table. The table has four columns: 'id', 'user\_email', 'search\_query', and 'search\_time'. There are two rows of data:

	id	user_email	search_query	search_time
	1	mdtaminhossain3944@gmail.com	Dynamic Programming	2025-05-23 17:36:37
	3	mdtaminhossain3944@gmail.com	Tree	2025-05-24 00:10:24

# Conclusion

The CP School platform, meticulously developed by Team T<sup>2</sup>SI, exemplifies a well-structured and innovative educational solution tailored for aspiring competitive programmers. Through its comprehensive modules, interactive assessments, and multimedia integration, the platform delivers a seamless and enriching learning experience that addresses diverse learner needs.

The implementation of a normalized relational database ensures data integrity, security, and efficient management of user information, search histories, and page visit records. This robust backend architecture facilitates real-time progress tracking and personalized learning journeys, thereby enhancing user engagement and educational outcomes.

By harmonizing advanced technologies with user-centric design principles, Team T<sup>2</sup>SI has successfully created a scalable and reliable system that not only supports knowledge acquisition but also fosters analytical thinking and problem-solving skills. This project stands as a testament to the team's dedication and technical expertise, contributing meaningfully to the field of competitive programming education and setting a strong foundation for future enhancements.

# Thank You!

We appreciate your time and interest in our project.  
If you have any questions or feedback, feel free to reach out.  
Team T<sup>2</sup>SI  
Together, towards success!

