1. INTRODUCTION

In today’s rapidly evolving digital world, gaming platforms have seen a surge in popularity, especially those that integrate elements of simulation, betting, and real-time interaction. One such domain that blends excitement with strategic decision-making is **virtual horse race betting**. The "Horse Race Game" project aims to replicate the thrill of traditional horse racing in an online environment, allowing users to participate in simulated races and place virtual bets from the comfort of their devices.

The project introduces a **web-based horse racing and betting system** that is secure, interactive, and user-centric. It utilizes **PHP** for server-side scripting, **PostgreSQL** as the backend database, and **HTML/CSS** for the front-end interface. This system enables registered users to view ongoing races, place bets, apply promotional coupons, and track their wallet balances. The **admin panel** allows administrators to update race results, manage user accounts, and issue winning amounts based on outcomes.

This system not only offers a form of entertainment but also integrates **key features such as user authentication, betting logic, wallet management, and coupon application**, which are often lacking or underdeveloped in existing platforms. It also focuses on ensuring a **fair and transparent betting process**, where race results are managed securely, and each transaction is recorded.

The **objective** of the Horse Race Game is to develop a **scalable and responsive platform** that can handle multiple users simultaneously, offer real-time updates, and provide a smooth and engaging user experience. The design emphasizes **ease of navigation**, secure handling of data, and engaging gameplay, making the platform accessible to both beginners and experienced users alike.

By gamifying traditional betting, the Horse Race Game opens up new possibilities in the domain of digital entertainment. It acts as a proof of concept for integrating **gaming, transaction systems, and database-driven logic** into a unified application.

Furthermore, the system is structured to be **extendable**, allowing for future integration of more advanced features like live animations, race odds calculations, leaderboards, and more.

Ultimately, this project demonstrates how **technology can be leveraged to recreate traditional experiences in the digital sphere**, promoting innovation in online gaming and simulation.

1.1 DETAILED PROBLEM DEFINITION

Horse racing is a traditional and widely loved form of entertainment and betting, but in its physical form, it is limited by location, availability, and resources. The modern digital era calls for a virtual system that can bring the thrill of betting and racing to users from anywhere in a controlled, secure, and engaging environment. Despite the popularity of horse betting and racing games, existing systems are either too complex, lack real-time interactivity, or fail to provide a balanced gaming and betting experience that is user-friendly, secure, and scalable.

The major issues in the current betting and gaming platforms are as follows:

1. Limited Accessibility and Engagement

Many horse race betting systems are either localized or operated by private firms, limiting access for average users. Physical attendance or region-specific apps reduces the reach and usability of the system. Additionally, some platforms do not offer engaging gameplay that mimics the excitement of real races.

2. Lack of User-Friendly Interfaces

Some existing systems have complex user interfaces, confusing navigation, or limited customization. This makes it difficult for new users to engage with the platform, resulting in reduced participation.

3. Security and Fair Play Concerns Users hesitate to participate due to the fear of fraud or lack of transparency in race outcomes. A virtual game needs to simulate fair race outcomes and provide secure handling of user accounts and financial transactions (bets and winnings).

4. Absence of Gamification and Real-Time Simulation

Many platforms miss out on gamified experiences. The lack of animated visuals or race simulations often makes the betting process seem static. A better experience would include visual race progressions, lap simulations, and a real-time betting system.

5. Minimal Progress Tracking or Betting History

Users should be able to view their betting history, track their performance, winnings, and losses over time. Existing systems rarely offer such features, which are important for a user to stay engaged and informed.

6. No Coupon or Reward System
Platforms often lack motivational features like discount coupons, rewards, or promotions that incentivize user participation. A system that allows users to apply coupons or earn bonuses can increase user retention and engagement.
7. Scalability and Load Handling
As more users join and place simultaneous bets, performance issues like slow updates, server lags, or inconsistent race results can occur in inadequately designed systems. This calls for a robust backend capable of handling load efficiently.
Summary:
The proposed **Horse Race Game** project aims to address these problems by offering an **online virtual horse betting and race simulation system**. It integrates a **user-friendly UI**, secure backend operations using **PHP and PostgreSQL**, and features like **coupon code application**, **wallet integration**, **race simulation**, and **bet tracking**. The system intends to provide a **fair, enjoyable, and interactive experience**, making betting more accessible and reliable for users.

1.2 PRESENTLY AVAILABLE SYSTEM FOR THE SAME

Horse race betting, both physical and digital, has been a widely popular form of entertainment for decades. In the modern era, several **online platforms and applications** have emerged, offering users the opportunity to place bets on virtual or real horse races. These platforms typically simulate race environments, calculate odds, and offer real-time or pre-recorded results. However, most of the currently available systems tend to fall into either of the following categories:

1. Bet365 (and other real-world betting platforms)

Bet365 and similar betting platforms offer **real-time betting on actual horse races** happening around the world. These systems are highly advanced with features such as:

- Live race streaming
- Dynamic odds based on real-time data

- Multi-currency and real-money transactions
- Complex betting models (win/place/show, trifecta, exacta, etc.)

However, such systems require **government approvals, licensing**, and a **high degree of regulatory compliance**, making them inaccessible for educational or simulation-based implementations. These systems are not beginner-friendly and are primarily built for serious gamblers.

2. Virtual Horse Racing Apps and Games (e.g., Rival Stars, Photo Finish)

There are also several **mobile games and web-based simulators** that simulate horse racing for fun without involving real money. These platforms:

- Focus heavily on **graphics and animations**
- Allow players to own, train, and race horses
- Sometimes integrate in-game betting using virtual currencies

While entertaining, these platforms **lack real-time betting logic**, database-backed financial management, and user authentication systems similar to the one designed in the Horse Race Game project.

3. Open Source & Local Betting Simulators

Some open-source projects and university-level demos exist that simulate basic betting systems for events such as sports matches or horse races. These are often:

- **Limited in scope and features**
- Lack modern **UI/UX principles**
- Do not provide full functionality like **coupon application, admin panel, wallet system, or session-based user tracking**

They may demonstrate core concepts but fall short in delivering a **comprehensive betting experience** with a proper backend structure.

4. Casino Software and Horse Betting APIs

Some casino and third-party sports APIs (like Betfair) offer horse race odds and allow integration for advanced applications. These:

- Are **not open-source** and often require **subscriptions or legal contracts**
- Are highly **complex** for educational or personal use
- Do not provide a standalone gaming interface — they require additional frontend and backend development

Summary

While there are several advanced and professional systems currently available, they are often:

- **Costly**
- Require **legal clearance**
- **Too complex** for students or beginner developers
- Lacking in educational transparency and customization

The **Horse Race Game project bridges this gap** by providing a **lightweight, educational, and customizable platform** that:

- Simulates a real horse race environment
- Allows for betting with wallet integration
- Includes an admin panel and coupon system
- Offers simplicity in structure while covering core functionalities of a betting system

It serves as an **ideal learning tool** and a foundation for future enhancements, without the legal and financial complications of commercial platforms.

1.3 NEED FOR THE NEW SYSTEM

In the current digital age, **interactive and simulation-based gaming platforms** are increasingly popular—not only for entertainment but also for educational and analytical purposes. However, most existing horse race betting systems are either

commercial-grade with complex features and legal bindings, or **basic simulations** lacking realism, personalization, and dynamic functionality. This leads to the need for a **custom-built system** like the **Horse Race Game**, which addresses several limitations of existing solutions.

Key Reasons for the New System

1. Lack of Beginner-Friendly Platforms

Existing betting platforms are not designed for learners, students, or casual users. They:

- Use real money, creating risk
- Offer overwhelming complexity
- Are difficult to understand without gambling knowledge

The new system simplifies betting into an educational simulation, where users can:

- Practice virtual betting
- Learn how odds and payouts work
- Understand session-based user tracking without real-world risk

2. No Integrated Wallet and Coupon System in Educational Models

Most basic games and simulations lack realistic **wallet systems** or promotional features like **coupon codes**. In real platforms, such systems enhance:

- **User engagement** (via offers)
- **Control over balance**
- **Admin-managed transactions**

The new Horse Race Game includes:

- A virtual wallet to manage funds
- A coupon redemption system
- Admin-controlled user bonuses and balances

3. Absence of a Controlled Admin Environment

Existing simulators and games rarely include **admin panels** to:

- Monitor user activity
- Distribute rewards or coupons
- Manage race settings or outcomes

The new system empowers the admin to:

- Manually manage user data
- Send certifications or bonuses
- Handle the backend securely and efficiently

4. Need for a Project-Based Learning Model

There is a lack of fully built, scalable systems that students can:

- Understand end-to-end
- Use as a case study
- Expand upon in future learning

This system covers:

- PHP and PostgreSQL integration
- Secure login and session management
- Clean UI with HTML, CSS
- Real-time simulation logic
- Admin-user communication

5. Flexible and Scalable Design

Unlike rigid commercial systems, this platform is:

- Easy to deploy and modify
- Built with scalable architecture
- Designed with modularity to add features like:
  - Leaderboards
  - Game analytics
  - AI-generated race outcomes

Summary

The **Horse Race Game** addresses the shortcomings of currently available platforms by creating an:

- **Educational, interactive, and secure** betting simulation
- Easy-to-use system for both **users and administrators**
- **Feature-rich experience** with modern web design, backend logic, and user session control

This new system not only delivers core functionality for simulated betting but also serves as a practical foundation for **academic learning, research, and future enhancements.**

1.4 PROJECT SCOPE

The **Horse Race Game** project is a **web-based simulation system** that mimics the real-world betting experience in a controlled and risk-free environment. The scope of the project revolves around designing and developing a full-stack application that includes **user management**, **wallet integration**, **coupon-based rewards**, **race simulations**, and a dedicated **admin panel**.

This system is primarily built using **PHP for backend**, **PostgreSQL for database management**, and **HTML/CSS for the front-end UI**, ensuring a smooth and responsive user experience.

🔍 Key Features Covered Under the Project Scope

✅ User Registration and Login

- Secure session-based user authentication
- Unique user ID management
- Login validation and error handling

✅ **Wallet System**

- Display of current balance
- Wallet managed through PostgreSQL
- Virtual money for placing bets
- Recharge options through admin-based coupon codes

✅ **Coupon Code System**

- Users can apply coupon codes to earn bonus balance
- Coupons managed and issued by admin
- Server-side validation to avoid re-use or abuse

✅ **Horse Race Simulation Interface**

- Users can bet on any horse
- Predefined winning logic (randomized or set by admin)
- Payouts based on winning bets
- Dynamic interface using HTML and simple animations (optional upgrade)

✅ **Admin Panel**

- Admin can view all users
- Issue or revoke coupons
- Modify user balances
- Manage race outcomes (optional)
- Send virtual certificates or messages via email (for added features)

✅ **Responsive Design**

- Accessible on desktops, laptops, and mobile browsers
- User-friendly interface with intuitive navigation

✅ **Secure Data Handling**

- PostgreSQL used for structured, reliable data storage
- All critical data like login credentials, wallet info, and coupon logs are securely stored and queried using prepared statements to prevent SQL injection

✅ **Extensibility**

The project is modular and easily scalable. Future enhancements can include:

- Leaderboards
- Real-time betting odds
- Multiplayer features
- AI-generated race predictions
- Advanced animations

✅ **Use Case Fit**

- **For Students**: As a project-based learning model combining full-stack skills
- **For Teachers**: As a demonstration tool for session handling, database design, and real-world application
- **For Users**: A fun, educational platform to understand the logic of betting without involving real money

2.ANALYSIS

2.1 Feasibility Study

2.1.1 TECHNICAL FEASIBILITY:

The **technical feasibility** of the Horse Race Game project evaluates whether the current technology stack and resources can support the successful development and deployment of the system. After a thorough analysis, it is confirmed that the required technologies and tools are available, accessible, and suitable for building a fully functional horse racing simulation and betting system.

✅ Technology Stack Used

Component	Technology Used	Justification
Frontend	**HTML5, CSS3**	For creating responsive and interactive web pages
Backend	**PHP**	Open-source, widely supported server-side scripting language
Database	**PostgreSQL**	Powerful, open-source relational database for secure and efficient data handling
Server Platform	**XAMPP / LAMP / WAMP / Localhost**	For local development and testing of PHP and PostgreSQL
Styling	**CSS with Custom Classes**	Enhanced visual appearance and responsive design
Browser Support	**Chrome, Firefox, Edge, etc.**	Ensures the application is cross-browser compatible
Code Execution	**Apache Web Server**	Handles PHP files and client requests effectively

🔧 Development Tools and Resources

- **Text Editor/IDE:** VS Code, Sublime Text, PHPStorm (for writing and debugging code)
- **Browser Developer Tools:** For testing UI responsiveness and debugging JavaScript/CSS
- **PostgreSQL Admin Tools:** pgAdmin or command-line tools for managing the database

💡 Technical Strengths

1. **Platform Independent:**

   - The system is web-based, allowing users to access it from any device with a browser and internet access.
2. **Open Source Tools:**
   - All tools used (PHP, PostgreSQL, HTML/CSS) are open-source, reducing development costs.
3. **Database Support:**
   - PostgreSQL ensures robust data handling, supports multiple users, and is ideal for transactional systems like wallet management.
4. **Security:**
   - Prepared statements (like `pg_query_params`) are used in PHP for database interaction, preventing SQL injection attacks.
   - Session management ensures only authenticated users access the wallet and game.
5. **Maintainability:**
   - Modular code with separation of frontend and backend logic allows easier maintenance and future scalability.

⚙️ System Requirements

- **Client Side:**
  - Any modern browser (Chrome, Firefox, Edge)
  - Device with internet access
- **Server Side:**
  - Apache server with PHP installed (XAMPP/WAMP)
  - PostgreSQL server
  - At least 4GB RAM for local server hosting (more for production)

Conclusion:

From a technical perspective, the Horse Race Game project is highly feasible. All the technologies involved are well-supported, widely used in the industry, and suitable for building scalable, secure, and responsive applications. The system can be built and deployed efficiently within the available infrastructure, making it a technically viable project.

2.1.2 ECONOMIC FEASIBILITY:

Economic feasibility assesses whether the cost of developing and maintaining the system is justified by the expected benefits. It involves comparing the estimated expenses with the anticipated returns to ensure the project is financially practical and sustainable.

💰 Cost Considerations

The *Horse Race Game* project is designed to be a cost-effective solution using open-source tools and minimal infrastructure. Below are the key cost factors:

Category	Description	Estimated Cost
Development Tools	Use of open-source technologies like PHP, HTML, CSS, and PostgreSQL	₹0
Hosting (Local/Server)	Local server via XAMPP/LAMP; optional deployment on a shared hosting plan	₹0 to ₹3,000/year
Domain Name (optional)	Only required if hosted online (not needed for local deployment)	₹1,000/year
Hardware	Existing PC/laptop with moderate specs	₹0
Maintenance	Handled by developers; no third-party contracts needed	₹0
Testing Tools	Manual testing using browser developer tools and console logs	₹0

Total Estimated Initial Cost: ₹0 – ₹4,000 (depending on hosting choice)

✅ Benefits vs. Cost

Benefit	Description
No Software Licensing Fees	The use of open-source software eliminates expensive licensing costs.
Educational & Portfolio Value	Acts as a strong academic and personal project to demonstrate technical skills.
Reusable Codebase	The developed modules can be reused in similar gaming or simulation apps.
Low Maintenance Overhead	Simple architecture ensures minimal ongoing maintenance costs.
Scalability	The system can be upgraded with little to no extra cost if requirements grow.

📊 Return on Investment (ROI)

While the system may not generate direct revenue in a classroom or academic setting, it offers high ROI in terms of:

- Skill development in full-stack development.
- Academic value for students and professors.
- Potential future monetization or expansion into a commercial game platform.
- Contribution to open-source gaming or educational repositories.

🧾 Conclusion

The *Horse Race Game* is **economically feasible**. It provides maximum value with minimal or no cost investment due to the use of open-source tools and self-managed infrastructure. The indirect benefits such as skill development, knowledge enhancement, and academic contribution far outweigh the minimal costs involved in the project.

2.1.3 OPERATIONAL FEASIBILITY:

Operational feasibility focuses on how effectively the proposed system will work within the current environment and how well it meets user requirements. It evaluates whether the users (admins, players, and other stakeholders) can operate, maintain, and benefit from the system once it's deployed.

🧩 System Usability and Interface

The Horse Race Game is designed with a **user-friendly web interface**, allowing users to easily:

- Log in or sign up securely.
- Access their dashboard.
- Manage their wallet and apply coupons.
- Join and play the horse race game with real-time interaction.
- View results and track winnings.

The interface uses **simple and intuitive navigation** with visually engaging UI components. It supports accessibility on both desktop and mobile browsers, enhancing user experience.

⚙️ Operational Simplicity

- **No prior training** is required to use the system due to its simplicity.
- Admins can **manage users, validate coupons**, and issue rewards through straightforward interfaces.
- Players can **play the game independently** without needing external assistance.

🔐 Security & Integrity

- The system includes **login sessions and user authentication**, preventing unauthorized access.
- PostgreSQL is used to store all user and game data securely.
- Inputs are validated, and secure form submissions are used to prevent SQL injections and misuse.

🎯 Meeting Organizational and User Goals

- For **educational or demonstration purposes**, the system fulfills the goal of showcasing PHP-PostgreSQL integration with a functional game module.
- For users, it provides **entertainment** and **learning value** through logic, timing, and rewards-based mechanisms.
- Admins are equipped with essential tools to **monitor and manage the platform** without manual intervention.

🚀 Deployment and Maintenance Readiness

- The system can be **easily deployed on local or cloud servers** with minimal setup.
- Future enhancements or bug fixes can be done easily, as the system is modular and well-documented.

✅ Conclusion

The Horse Race Game project is **operationally feasible**. It is easy to use, maintain, and adapt. It meets all functional and non-functional requirements and integrates smoothly into the intended environment, whether academic, testing, or entertainment-based.

2.2 TECHNICAL REQUIREMENTS:

This section outlines the technical specifications necessary for the development and deployment of the Horse Race Game, including the hardware configuration, development platform, and the coding standards used throughout the project.

2.2.1 Hardware Specifications:

To develop, run, and test the Horse Race Game system efficiently, the following hardware requirements are recommended:

Component	Minimum Requirement
Processor	Intel Core i3 or AMD equivalent
RAM	4 GB (8 GB recommended for smooth operation)
Hard Disk	Minimum 250 GB HDD / 128 GB SSD
Display	1366x768 resolution (1920x1080 recommended)
Input Devices	Standard keyboard and mouse
Network	Internet connectivity for updates and testing
Graphics	Basic graphics support for web rendering

2.2.2 Platform:

The project is developed and deployed using the following technologies and platforms:

Category	Details
Frontend	HTML, CSS, JavaScript
Backend	PHP 7.x or later
Database	PostgreSQL
Web Server	Apache (via XAMPP / WAMP / LAMP stack)
Operating System	Windows / Linux / macOS
Browser Support	Chrome, Firefox, Edge (latest versions)
IDE/Text Editor	Visual Studio Code, Sublime Text, Notepad++

The system is designed to be **browser-based**, making it accessible from any operating system with a modern web browser.

2.2.3 Coding Style :

To ensure clarity, maintainability, and consistency across the entire codebase, the following coding practices and standards were followed:

✅ General Coding Conventions

- Proper **indentation** (4 spaces/tab).
- Consistent **naming conventions**:
    - Variables and functions use **camelCase** (e.g., `userBalance`, `applyCoupon()`).
    - Database tables and columns use **snake_case** (e.g., `user_id`, `coupon_code`).
- **Descriptive variable and function names** for better readability.
- **Comments** added for complex logic, database queries, and important function blocks.

🛠️ PHP-Specific Practices

- Secure use of `pg_query_params()` to prevent SQL injection.
- Sessions used properly to manage user logins.
- Files are modular and logically separated (e.g., `wallet.php`, `game.php`, `db.php`).

🗃️ Database Code

- Primary keys and foreign keys are clearly defined.
- Table and column names are consistent.
- Relationships are normalized.

🎨 Frontend Code (HTML/CSS/JS)

- Responsive design using media queries.
- CSS classes follow **BEM-like structure** for modular styling.
- Clean, organized structure for form handling and layout.

3.Design

3.1 Database Table Designing

3.1.1 Identification of Stakeholders of the system :

Stakeholders are individuals or groups who are directly or indirectly involved with or impacted by the system. For the **Horse Race Game**, the main stakeholders include:

🔹 **1. Admin**

- **Role**: Manages users, horses, race setup, result declarations, and coupon management.
- **Responsibilities**:
  - Add or remove horses from the system.
  - Schedule races and publish results.
  - Monitor transactions and user wallet balances.
  - Generate and issue discount coupons.
  - View and analyze user activities and system reports.

🔹 **2. User (Player)**

- **Role**: Registers, places bets, participates in horse races, and manages wallet balance.
- **Responsibilities**:
  - Register and log into the system securely.
  - View available horses and race events.
  - Place bets using wallet balance.
  - Apply coupons to get wallet discounts.
  - View race results and wallet updates.

◆ **3. System (Automated Backend)**

- **Role**: Executes internal logic like race simulations, wallet deductions, coupon validation, and race result calculation.
- **Responsibilities**:
    - Automatically run race simulations and determine winners.
    - Validate coupon codes entered by users.
    - Adjust wallet balance after race results or coupon applications.
    - Notify users of updates and results.

◆ **4. Database Administrator (optional/technical role)**

- **Role**: Maintains the database for performance and security.
- **Responsibilities**:
    - Backup and restore database if needed.
    - Optimize queries and maintain schema consistency.
    - Ensure data integrity and prevent data leaks.

Once stakeholders are clearly defined, the next step is to create a database schema that supports all these actors and their interactions.

3.1.2 Input Data to the System:

Input data refers to the various types of information that are **entered or provided** to the system by users or administrators, which are then stored in the database and processed for gameplay, account management, betting, etc.

◆ **1. User Registration Details**

- **Input by**: User
- **Fields**:
    - Full Name
    - Email ID
    - Password
    - Phone Number
    - Date of Birth
    - Gender

🔹 2. Login Credentials

- **Input by**: User
- **Fields**:
  - Email ID or Username
  - Password

🔹 3. Horse Information

- **Input by**: Admin
- **Fields**:
  - Horse Name
  - Horse Color
  - Horse Speed (optional for simulation)
  - Description or History

🔹 4. Race Setup Data

- **Input by**: Admin
- **Fields**:
  - Race ID
  - Race Date and Time
  - Participating Horses
  - Race Length or Track Details

🔹 5. Betting Details

- **Input by**: User
- **Fields**:
  - Selected Horse
  - Amount to Bet
  - Selected Race ID
  - Wallet Balance (used for validation)

🔹 **6. Coupon Code Entry**

- **Input by**: User
- **Fields**:
  - Coupon Code (entered during wallet top-up)
  - Associated User ID

🔹 **7. Race Results**

- **Input by**: System or Admin (based on random logic or actual result)
- **Fields**:
  - Race ID
  - Winning Horse ID
  - Timestamp

🔹 **8. Wallet Transactions**

- **Input by**: System (based on actions like coupon use, betting, winning)
- **Fields**:
  - User ID
  - Amount Added/Deducted
  - Transaction Type (Coupon, Bet, Win, etc.)
  - Timestamp

These input data points ensure that the system is interactive and functional, capturing every necessary action or command from users and admins to run the **Horse Race Game** efficiently.

3.1.3 Output Information from the System:

The output information is the data **retrieved or displayed** to users and administrators from the database. These outputs ensure the system provides meaningful feedback, game results, and updated information based on user actions or system processes.

🔹 1. User Profile Information

- **Displayed to**: Users
- **Details Shown**:
  - Username / Full Name
  - Email
  - Registered Date
  - Wallet Balance
  - Game History or Bet History

🔹 2. Horse List and Stats

- **Displayed to**: Users & Admin
- **Details Shown**:
  - Horse Name
  - Horse Color
  - Total Wins (if recorded)
  - Participation History

🔹 3. Upcoming Races

- **Displayed to**: Users
- **Details Shown**:
  - Race Date & Time
  - Participating Horses
  - Race ID or Name
  - Betting Status (Open/Closed)

🔹 4. Race Results

- **Displayed to**: Users & Admin
- **Details Shown**:
  - Race ID
  - Date and Time
  - Winning Horse
  - Total Bets Placed

- User Win/Loss Outcome

🔹 **5. Betting Summary**

- **Displayed to**: Users
- **Details Shown**:
  - Race Bet On
  - Selected Horse
  - Amount Placed
  - Result (Win/Loss)
  - Amount Won (if applicable)

🔹 **6. Wallet Balance and Transaction History**

- **Displayed to**: Users
- **Details Shown**:
  - Current Balance
  - Last Transaction Date
  - Transaction Type (e.g., Bet, Win, Coupon)
  - Amount Added/Deducted

🔹 **7. Admin Dashboard Stats**

- **Displayed to**: Admin
- **Details Shown**:
  - Total Users
  - Active Bets
  - Number of Races Conducted
  - Revenue Generated (if monetized)
  - Active Coupons or Promotions

🔹 **8. Coupon Redemption Results**

- **Displayed to**: Users
- **Details Shown**:
  - Validity of Coupon Code
  - Amount Added (if valid)
  - Message (e.g., "Successfully Redeemed" or "Invalid Code")

These outputs ensure that both the **end users and the administrators** are kept informed with real-time data, game progression, transaction logs, and race outcomes — all essential for transparency, engagement, and functionality.

3.1.4 Functional or Processing Requirements of the System:

The **functional or processing requirements** define what operations the system must perform to fulfill user needs and manage data efficiently. These operations include everything from user registration to game outcomes and wallet transactions in the **Horse Race Game**.

🔹 **1. User Registration and Login**

- **Function**: Allows users to sign up and log in securely.
- **Process**:
  - Validate and store user credentials.
  - Authenticate users using session management.
  - Redirect based on login success/failure.

🔹 **2. Wallet Management**

- **Function**: Tracks user funds and handles transactions.
- **Process**:
  - Fetch current wallet balance.
  - Add or deduct amounts during betting or coupon redemption.
  - Record every transaction for transparency.

🔹 **3. Bet Placement**

- **Function**: Allows users to place bets on horses before a race.
- **Process**:
  - Display available races and horses.
  - Accept horse selection and bet amount.
  - Deduct bet amount from wallet.

  - Store bet details in the database.

🔹 4. Race Simulation and Result Generation

- **Function**: Simulate the race and determine a winner.
- **Process**:
  - Generate a random or algorithmic winner from participating horses.
  - Store race results in the database.
  - Compare user bets and update wallet if won.

🔹 5. Coupon Code Processing

- **Function**: Allows users to redeem codes for wallet top-up.
- **Process**:
  - Validate entered coupon code.
  - Check if it's expired or already used.
  - Add amount to wallet and mark the code as used.

🔹 6. Admin Controls

- **Function**: Provides administrators with control over key modules.
- **Process**:
  - Add/update/delete race or horse data.
  - Issue new coupons.
  - View total users, bets, revenue, and logs.

🔹 7. Game History and Reporting

- **Function**: Keeps records of past user activity.
- **Process**:
  - Show list of previous bets, outcomes, and transactions.
  - Filter and display reports per user or race.

🔹 8. Security and Data Integrity

- **Function**: Maintain secure operations and prevent data loss.
- **Process**:
    - Sanitize user inputs (to prevent SQL injections).
    - Encrypt passwords.
    - Ensure transactional integrity in wallet operations.

These functional requirements make the system robust, interactive, and easy to manage. Each process is critical for delivering a seamless and enjoyable gaming and learning experience in your **Horse Race Game** project.

Table Design:

1. Users Table:

Field Name	Field Type	Description
user_id	SERIAL (PK)	Unique ID for each user
username	VARCHAR(50)	Unique username
email	VARCHAR(100)	User’s email address
password	TEXT	Hashed user password
created_at	TIMESTAMP	Registration date and time

2. Wallet Table:

Field Name	Field Type	Description
wallet_id	SERIAL (PK)	Unique wallet ID
user_id	INTEGER (FK)	References Users(user_id)
balance	NUMERIC(10,2)	Current balance in user’s wallet
updated_at	TIMESTAMP	Last updated timestamp

3. Horses Table:

Field Name	Field Type	Description
horse_id	SERIAL (PK)	Unique ID for each horse
horse_name	VARCHAR(100)	Name of the horse
speed_rating	INTEGER	Relative speed for logic
status	VARCHAR(20)	Active/Inactive

4. Races Table:

Field Name	Field Type	Description
race_id	SERIAL (PK)	Unique ID for each race
race_name	VARCHAR(100)	Name of the race
race_date	DATE	Scheduled date of the race
winner_horse_id	INTEGER (FK)	ID of the winning horse (nullable)

5. Bets Table:

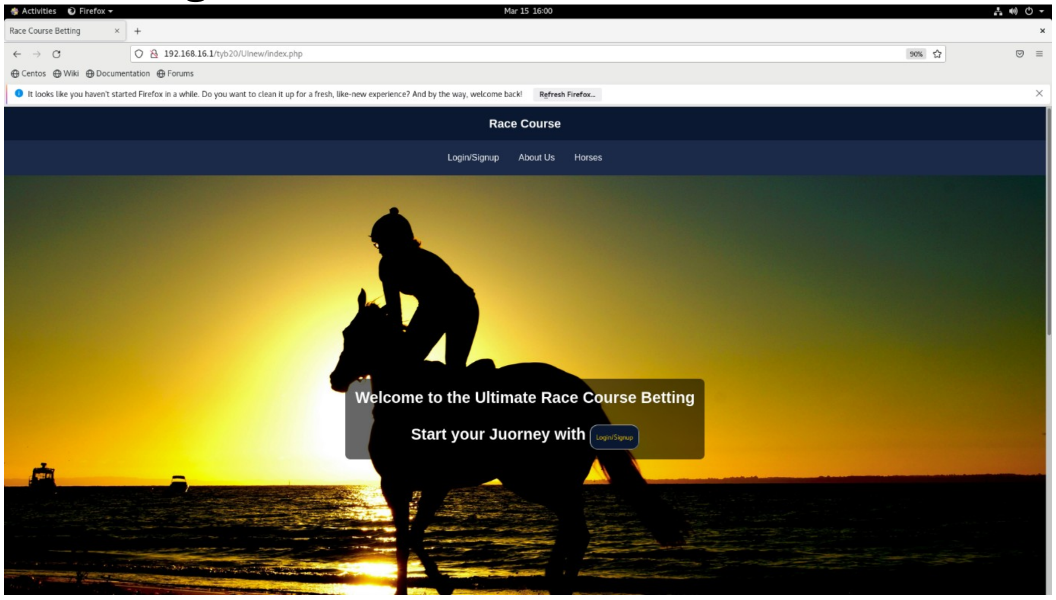
Field Name	Field Type	Description
bet_id	SERIAL (PK)	Unique bet ID
user_id	INTEGER (FK)	References Users(user_id)
race_id	INTEGER (FK)	References Races(race_id)
horse_id	INTEGER (FK)	Horse selected by the user
bet_amount	NUMERIC(10,2)	Amount placed on the horse
is_win	BOOLEAN	True if the user won the bet
created_at	TIMESTAMP	Date and time of bet placement

6. Coupons Table:

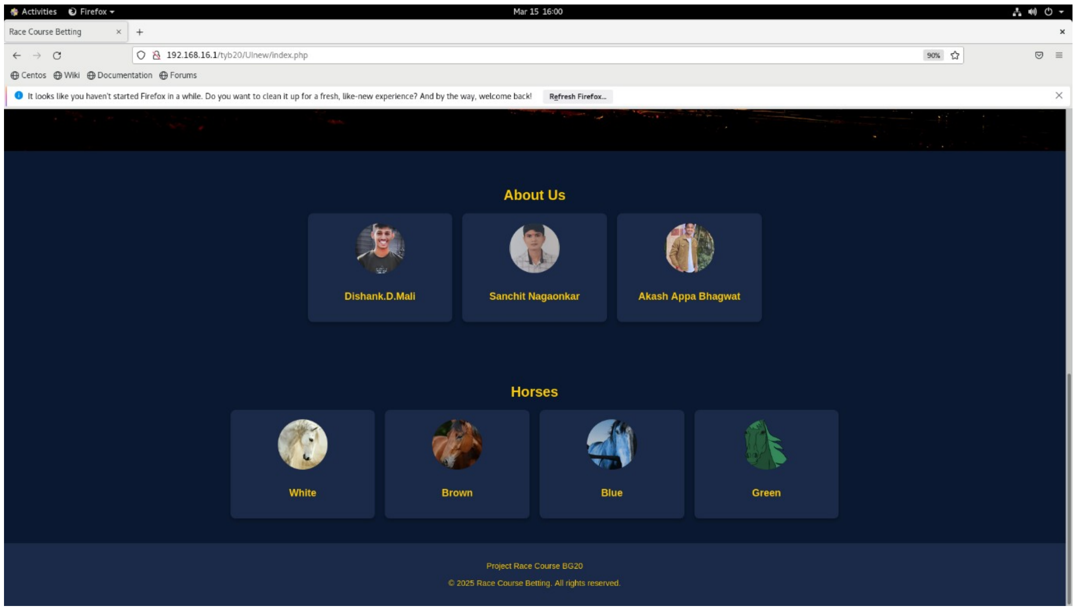
Field Name	Field Type	Description
coupon_id	SERIAL (PK)	Unique ID for the coupon
code	VARCHAR(50)	Unique coupon code
value	NUMERIC(10,2)	Amount to be credited to wallet
is_used	BOOLEAN	Status: used or unused
issued_to	INTEGER (FK)	References Users(user_id) (nullable)
expiry_date	DATE	Validity date of the coupon

3.2 Input and Output Screen and Reports

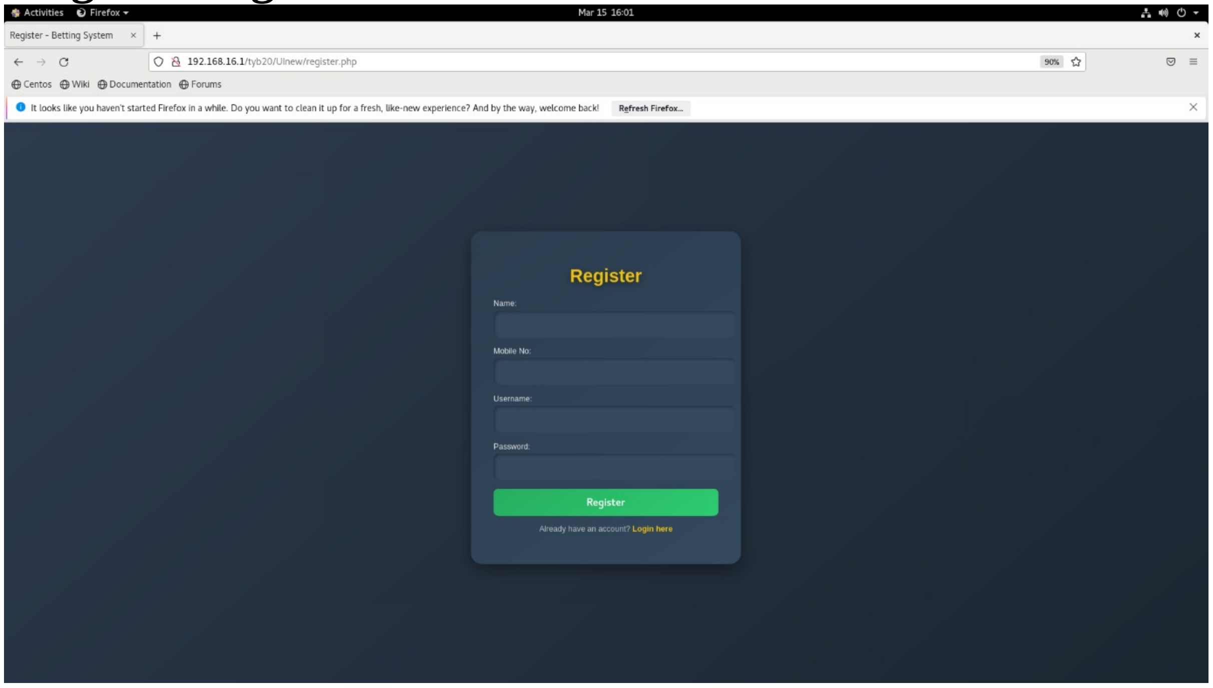
Home Page


Activities
Firefox
Mar 15 16:00
Race Course Betting
192.168.16.1/tyb20/UInew/index.php
90%
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Race Course
Login/Signup
About Us
Horses
Welcome to the Ultimate Race Course Betting
Start your Juorney with
Login/Signup

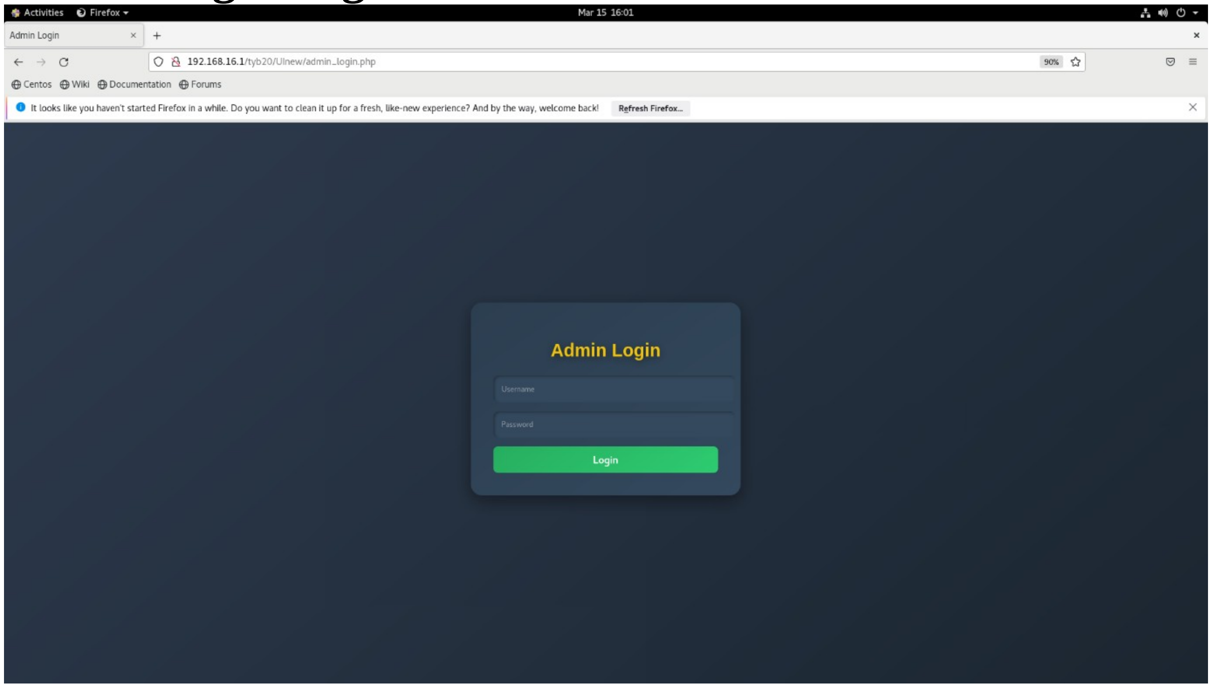
About Us


Activities
Firefox
Mar 15 16:00
Race Course Betting
192.168.16.1/tyb20/UInew/index.php
90%
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
About Us
Dishank.D.Mali
Sanchit Nagaonkar
Akash Appa Bhagwat
Horses
White
Brown
Blue
Green
Project Race Course BG20
© 2025 Race Course Betting. All rights reserved.

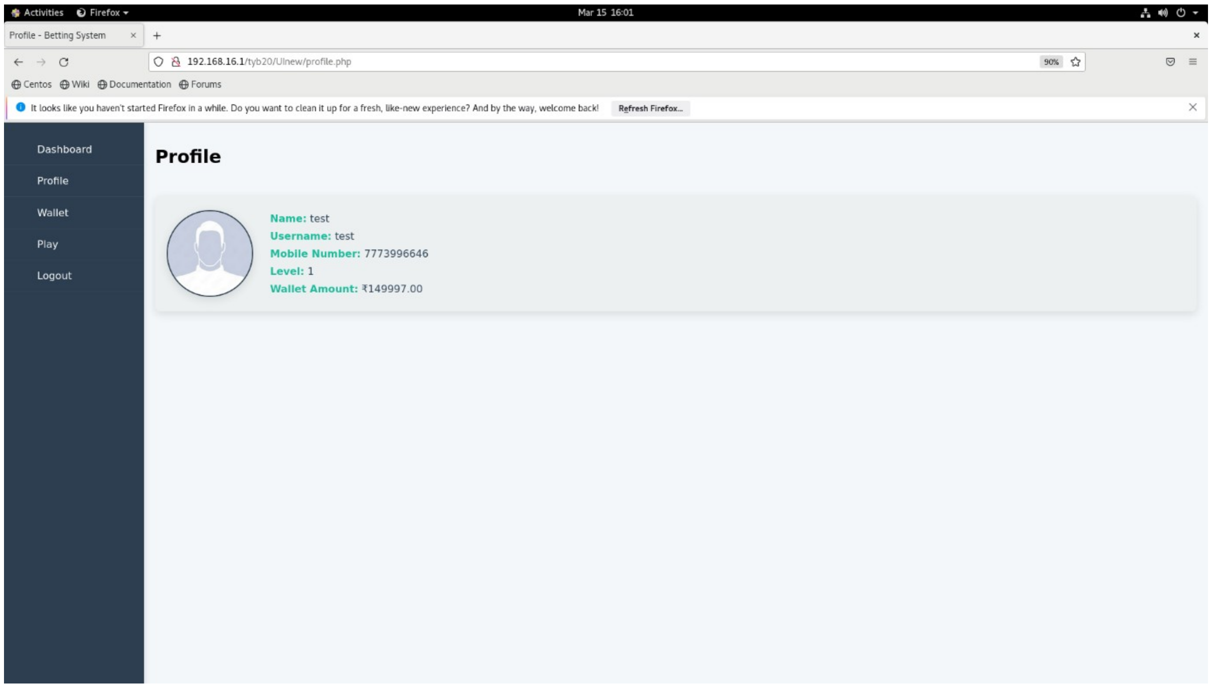
Register Page


Activities
Firefox
Mar 15 16:01
Register - Betting System
192.168.16.1/tyb20/UInew/register.php
90%
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Register
Name:
Mobile No:
Username:
Password:
Register
Already have an account? Login here

Admin Login Page

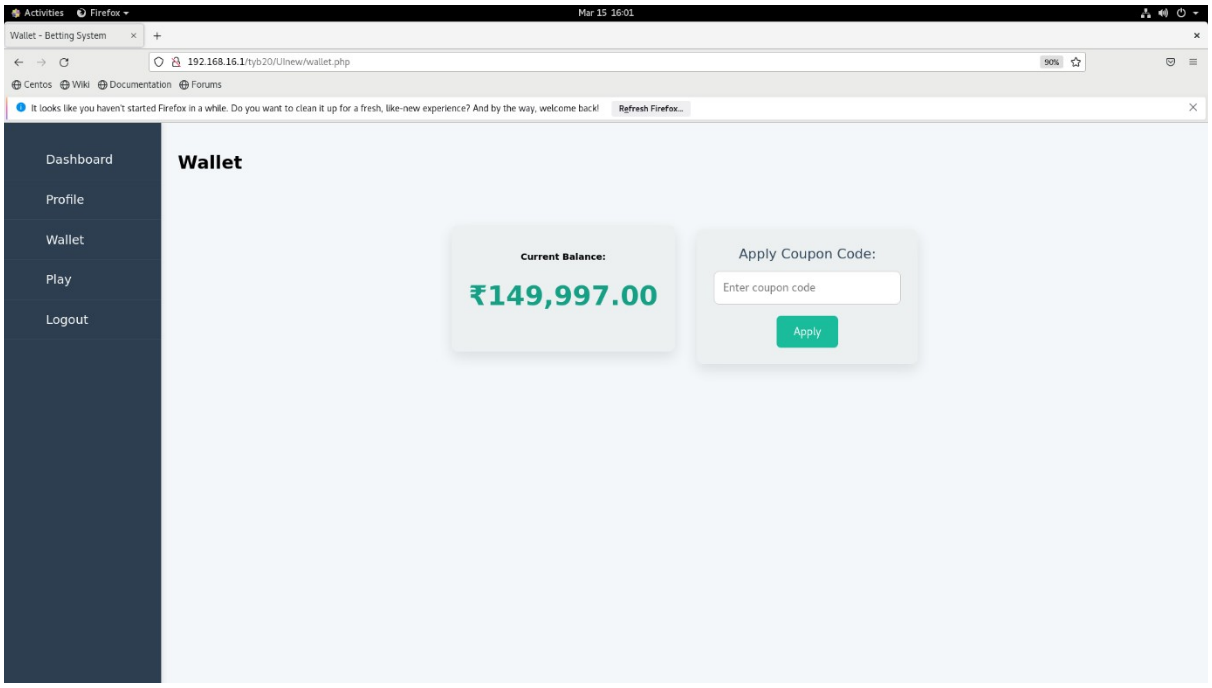


User Dashboard:Profile



Name: test
Username: test
Mobile Number: 7773996646
Level: 1
Wallet Amount: ₹149997.00

User Dashboard:Wallet


Activities
Firefox
Mar 15 16:01
Wallet - Betting System
192.168.16.1/tyb20/UInew/wallet.php
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Dashboard
Profile
Wallet
Play
Logout
Apply
Enter coupon code

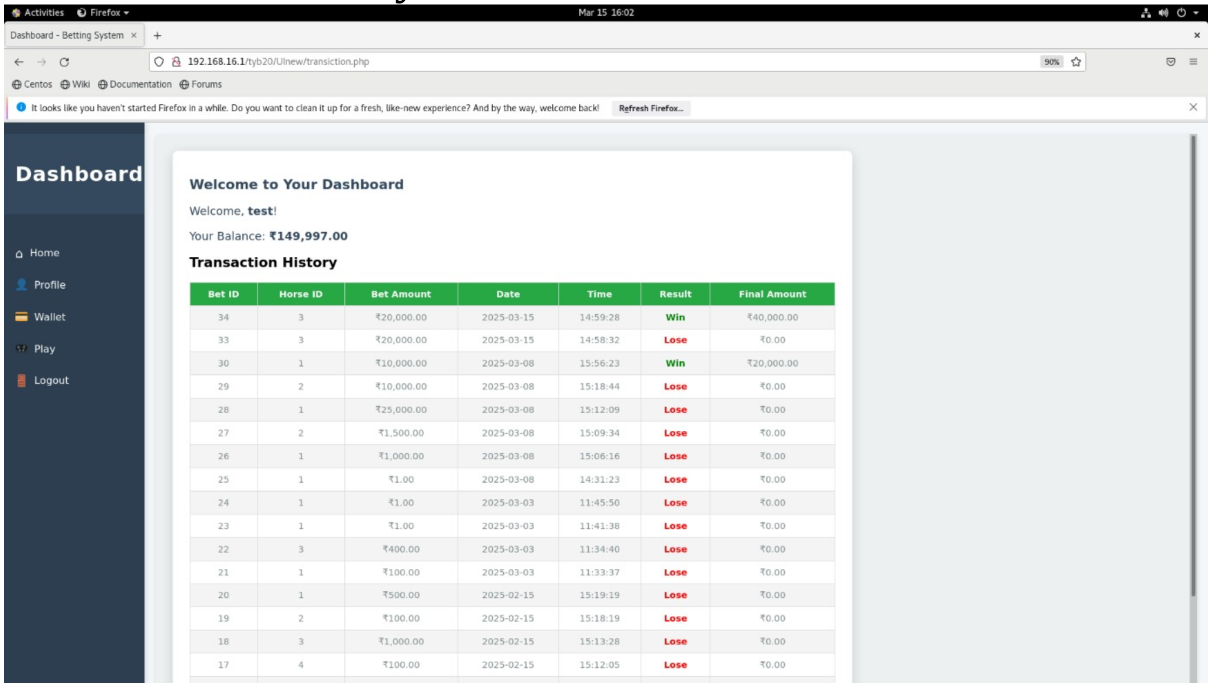
Wallet

Current Balance:

₹149,997.00

Apply Coupon Code:

Transaction History Dashboard


Activities
Firefox
Mar 15 16:02
Dashboard - Betting System
192.168.16.1/tyb20/UInew/transiction.php
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Dashboard
Home
Profile
Wallet
Play
Logout

Welcome to Your Dashboard

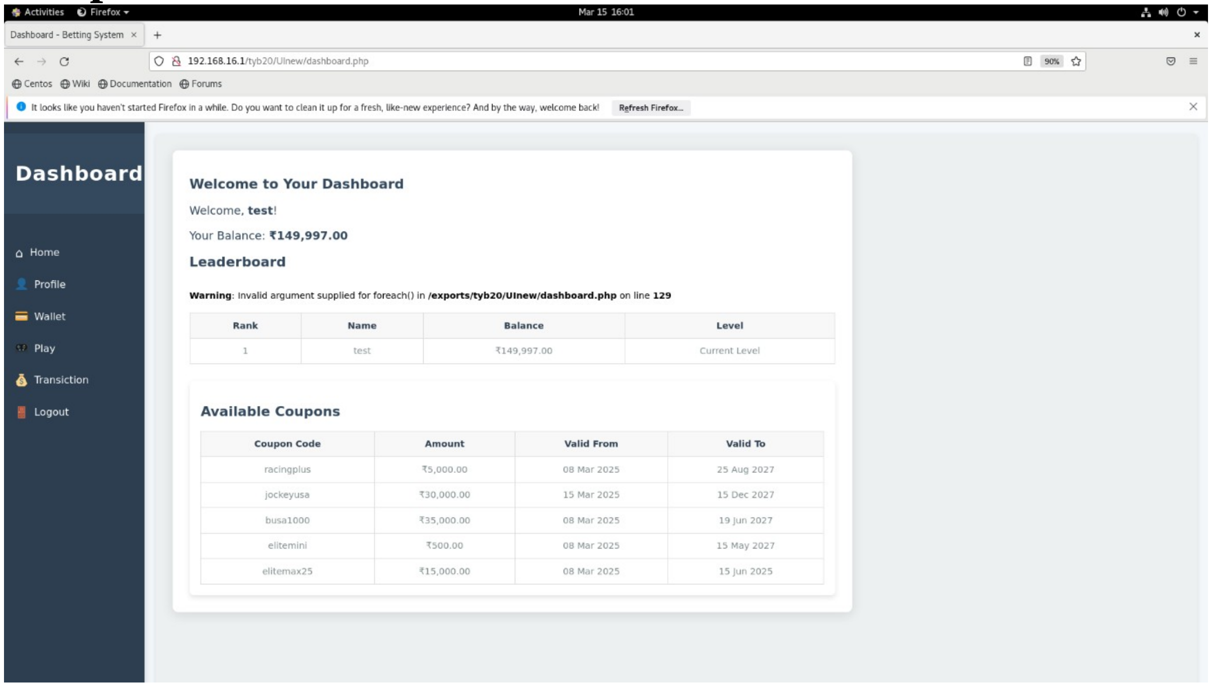
Welcome, **test**!

Your Balance: **₹149,997.00**

Transaction History

Bet ID	Horse ID	Bet Amount	Date	Time	Result	Final Amount
34	3	₹20,000.00	2025-03-15	14:59:28	Win	₹40,000.00
33	3	₹20,000.00	2025-03-15	14:58:32	Lose	₹0.00
30	1	₹10,000.00	2025-03-08	15:56:23	Win	₹20,000.00
29	2	₹10,000.00	2025-03-08	15:18:44	Lose	₹0.00
28	1	₹25,000.00	2025-03-08	15:12:09	Lose	₹0.00
27	2	₹1,500.00	2025-03-08	15:09:34	Lose	₹0.00
26	1	₹1,000.00	2025-03-08	15:06:16	Lose	₹0.00
25	1	₹1.00	2025-03-08	14:31:23	Lose	₹0.00
24	1	₹1.00	2025-03-03	11:45:50	Lose	₹0.00
23	1	₹1.00	2025-03-03	11:41:38	Lose	₹0.00
22	3	₹400.00	2025-03-03	11:34:40	Lose	₹0.00
21	1	₹100.00	2025-03-03	11:33:37	Lose	₹0.00
20	1	₹500.00	2025-02-15	15:19:19	Lose	₹0.00
19	2	₹100.00	2025-02-15	15:18:19	Lose	₹0.00
18	3	₹1,000.00	2025-02-15	15:13:28	Lose	₹0.00
17	4	₹100.00	2025-02-15	15:12:05	Lose	₹0.00

Coupons Dashboard



Dashboard - Betting System

192.168.16.1/tyb20/UInew/dashboard.php

It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

Dashboard

Home · Profile · Wallet · Play · Transiction · Logout

Welcome to Your Dashboard

Welcome, **test**!

Your Balance: **₹149,997.00**

Leaderboard

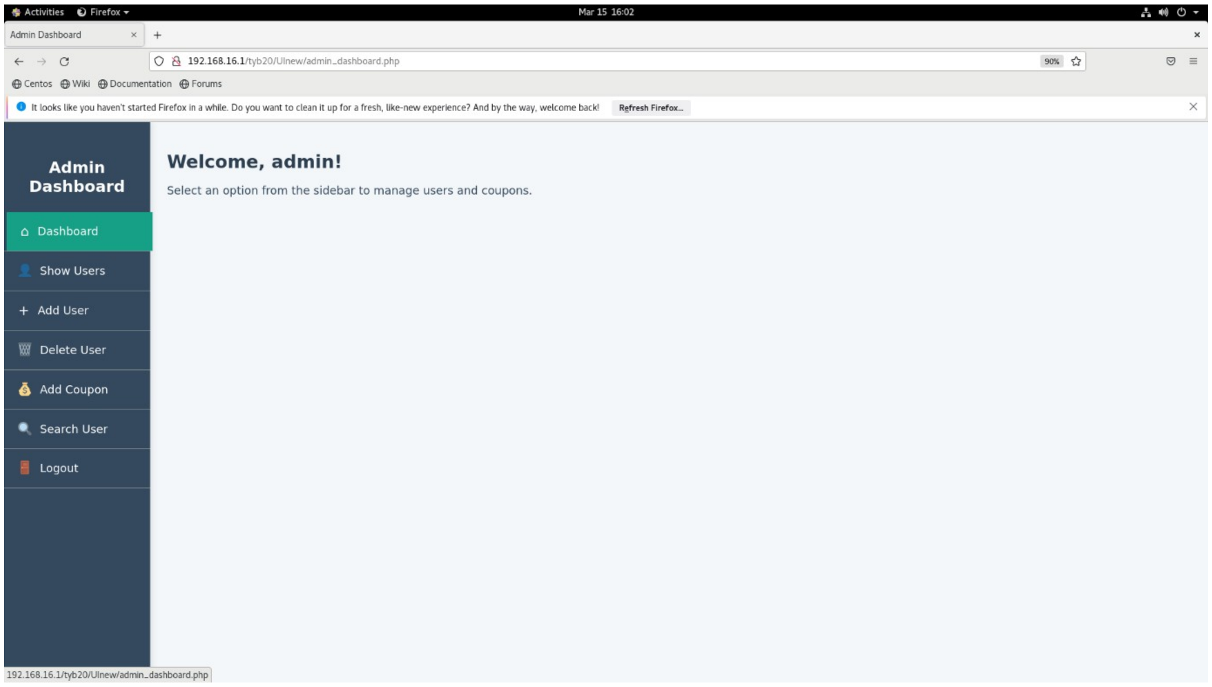
Warning: Invalid argument supplied for foreach() in **/exports/tyb20/UInew/dashboard.php** on line **129**

Rank	Name	Balance	Level
1	test	₹149,997.00	Current Level

Available Coupons

Coupon Code	Amount	Valid From	Valid To
racingplus	₹5,000.00	08 Mar 2025	25 Aug 2027
jockeyusa	₹30,000.00	15 Mar 2025	15 Dec 2027
busa1000	₹35,000.00	08 Mar 2025	19 Jun 2027
elitemini	₹500.00	08 Mar 2025	15 May 2027
elitemax25	₹15,000.00	08 Mar 2025	15 Jun 2025

Admin Dashboard



Admin Dashboard

192.168.16.1/tyb20/UInew/admin_dashboard.php

It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

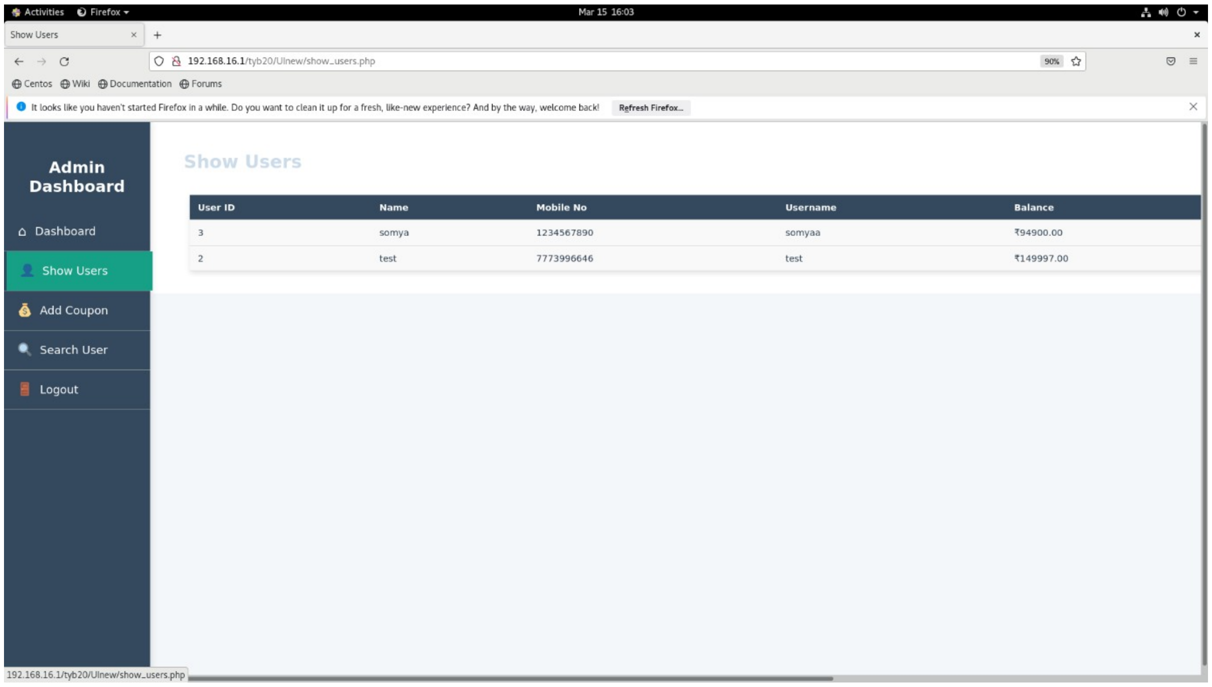
Admin Dashboard

Dashboard · Show Users · Add User · Delete User · Add Coupon · Search User · Logout

Welcome, admin!

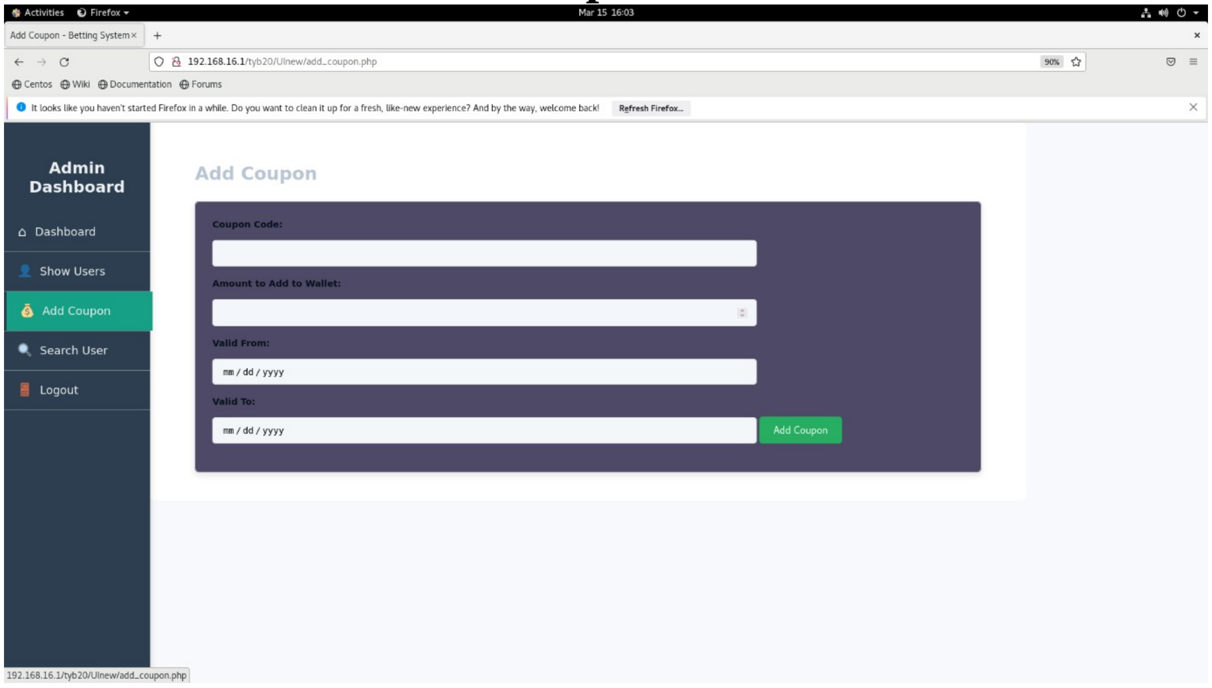
Select an option from the sidebar to manage users and coupons.

Admin Dashboard:Show Users

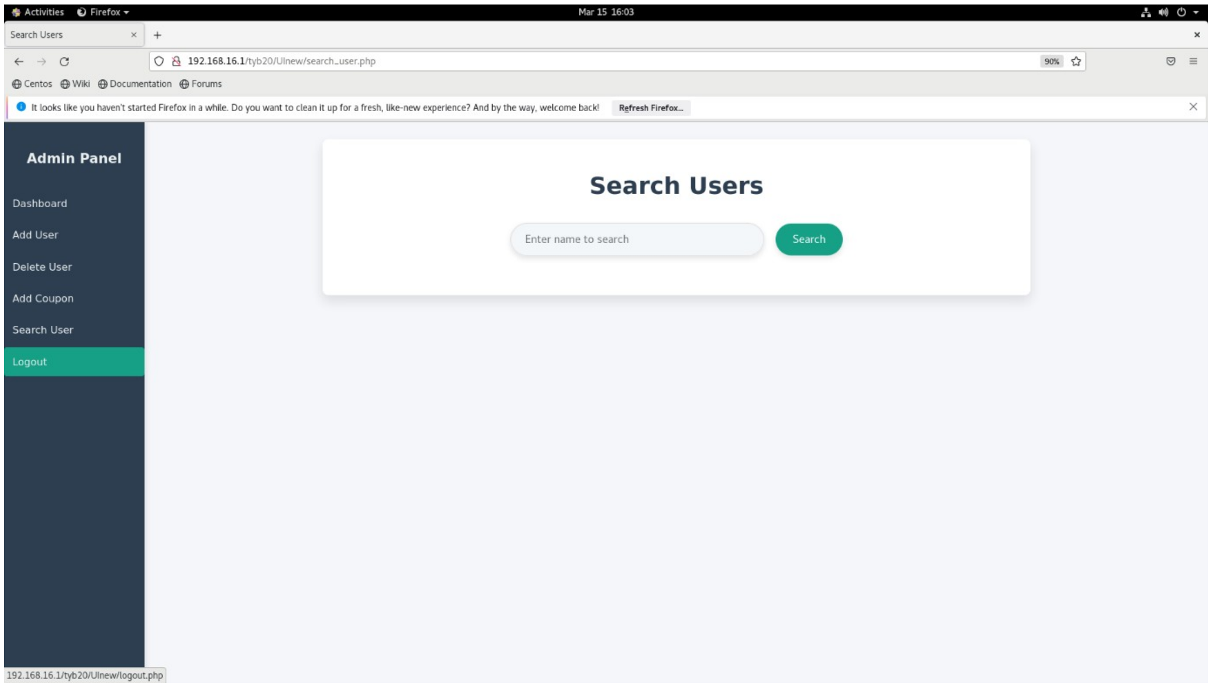

Activities
Firefox
Mar 15 16:03
Show Users
192.168.16.1/tyb20/UInew/show_users.php
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox…
Admin Dashboard
Dashboard
Show Users
Add Coupon
Search User
Logout
Show Users

User ID	Name	Mobile No	Username	Balance
3	somya	1234567890	somyaa	₹94900.00
2	test	7773996646	test	₹149997.00

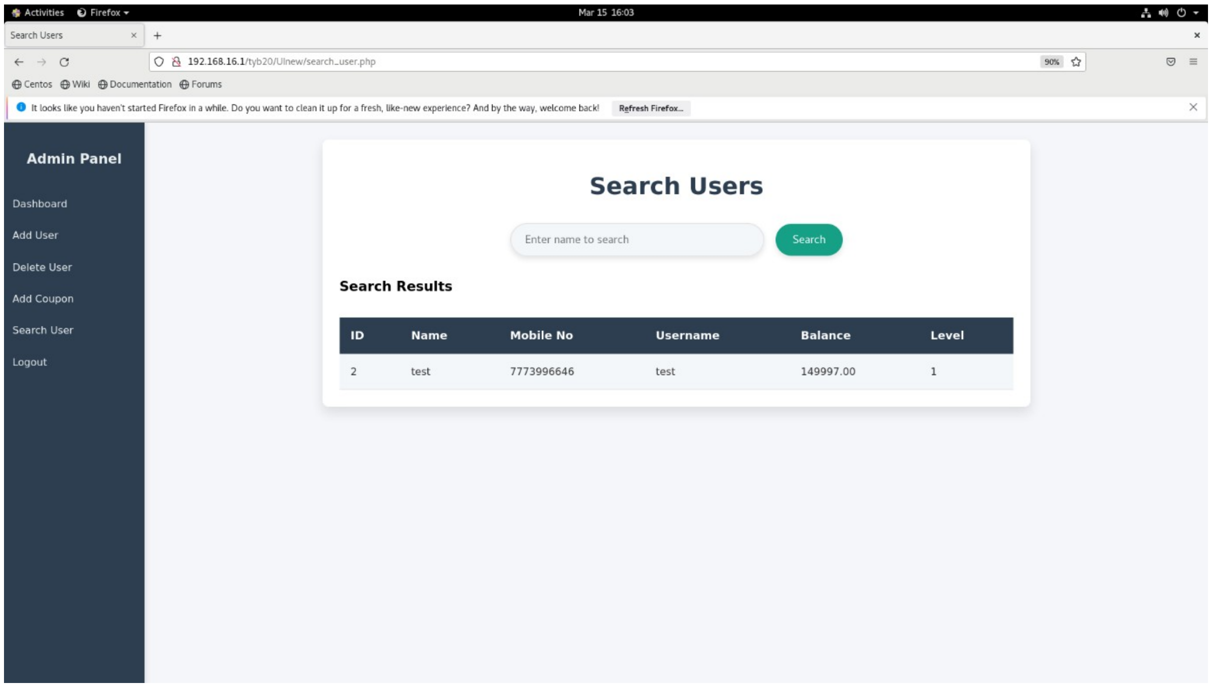
Admin Dashboard:Add Coupon



Admin Dashboard:Search Users


Activities
Firefox
Mar 15 16:03
Search Users
192.168.16.1/tyb20/UInew/search_user.php
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Admin Panel
Dashboard
Add User
Delete User
Add Coupon
Search User
Logout
Search Users
Enter name to search
Search
192.168.16.1/tyb20/UInew/logout.php

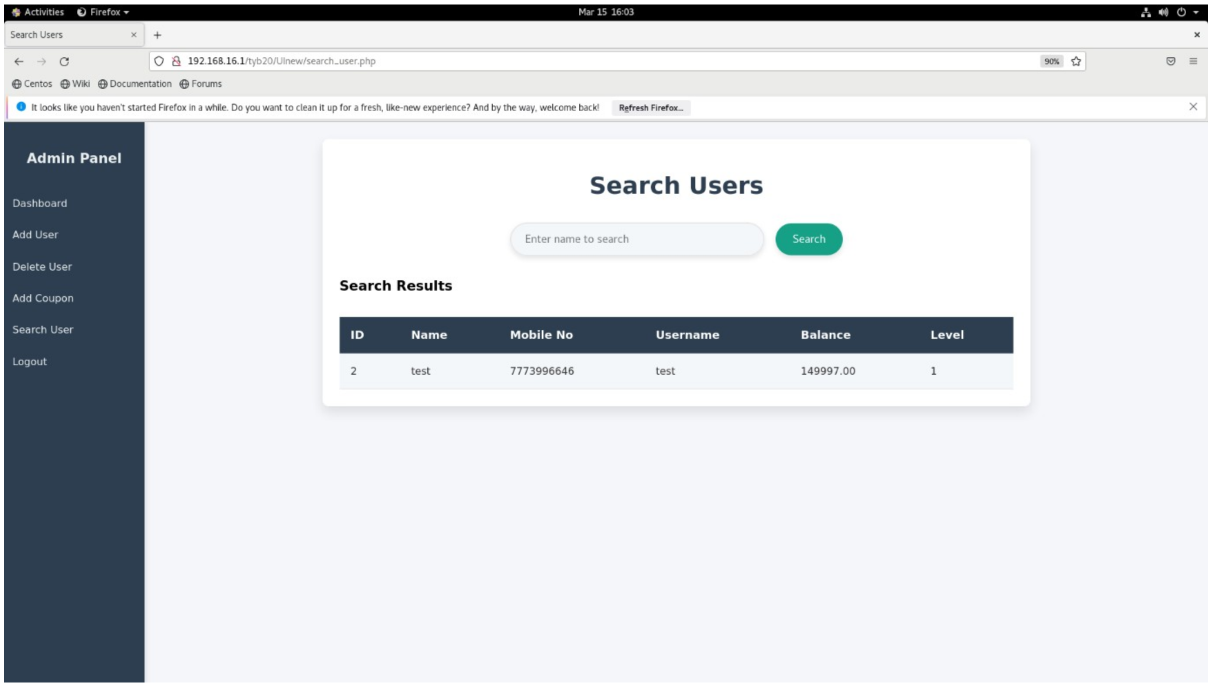
Admin Dashboard:Search Users



Search Results

ID	Name	Mobile No	Username	Balance	Level
2	test	7773996646	test	149997.00	1

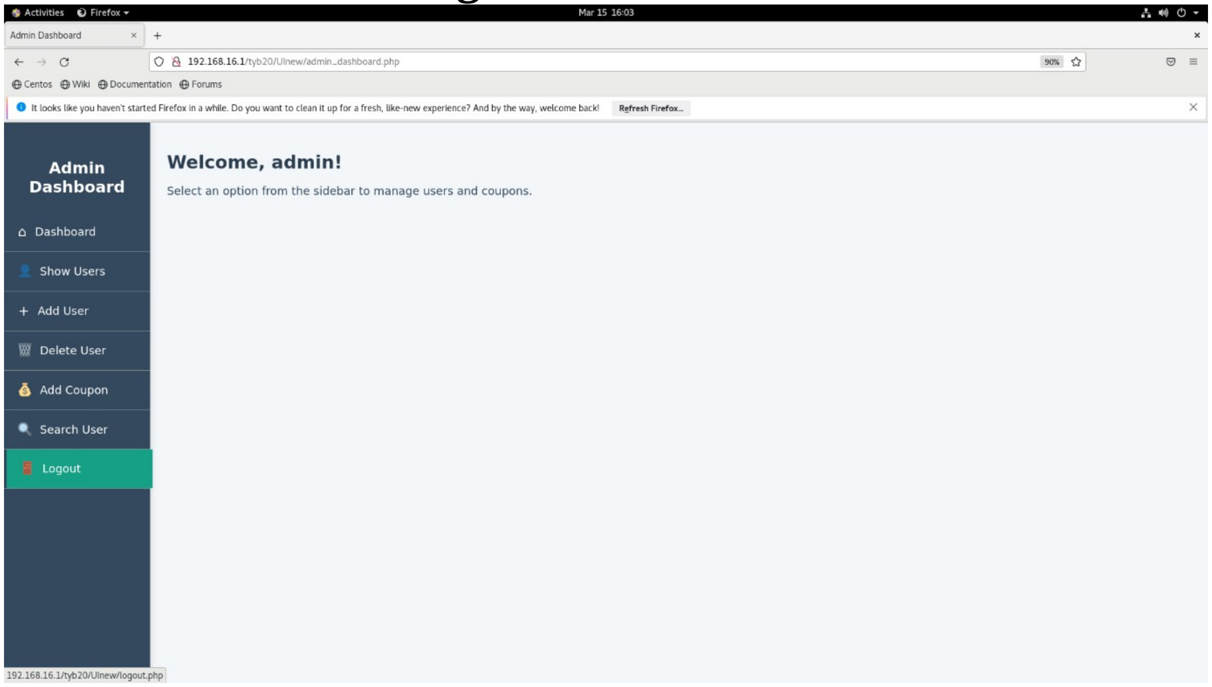
Admin Dashboard:Search Users



Search Results

ID	Name	Mobile No	Username	Balance	Level
2	test	7773996646	test	149997.00	1

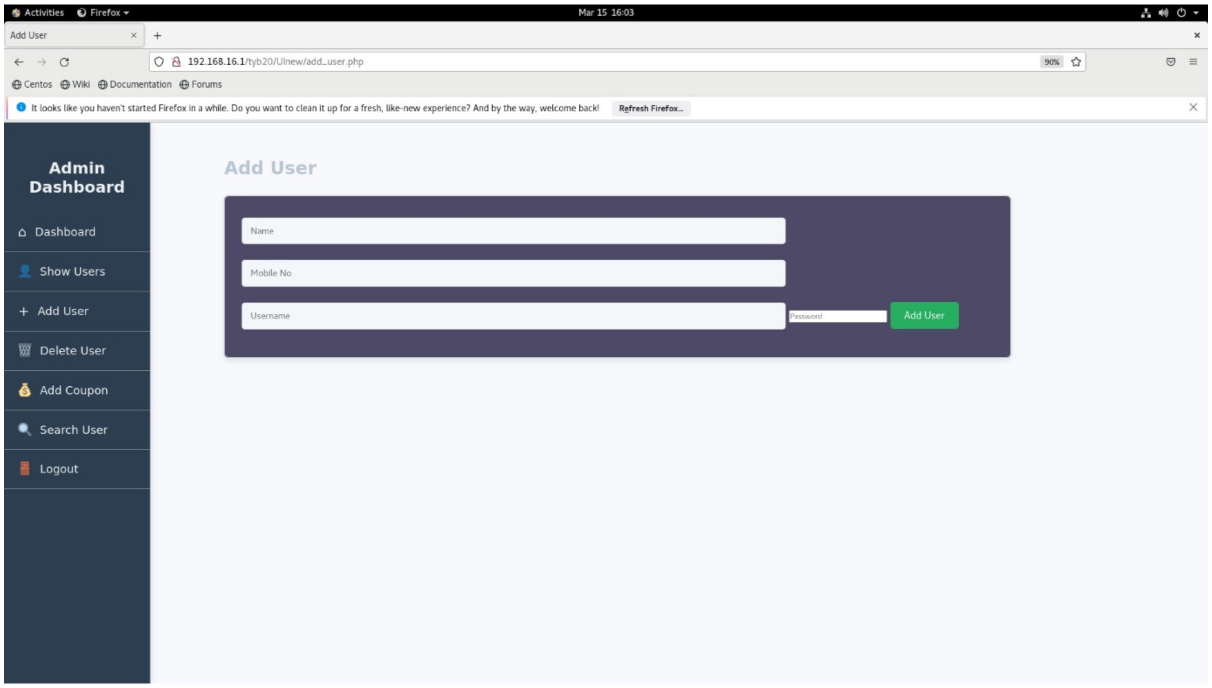
Admin Dashboard:Logout


Activities
Firefox
Mar 15 16:03
Admin Dashboard
192.168.16.1/tyb20/UInew/admin_dashboard.php
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Admin Dashboard
Dashboard
Show Users
Add User
Delete User
Add Coupon
Search User
Logout
192.168.16.1/tyb20/UInew/logout.php

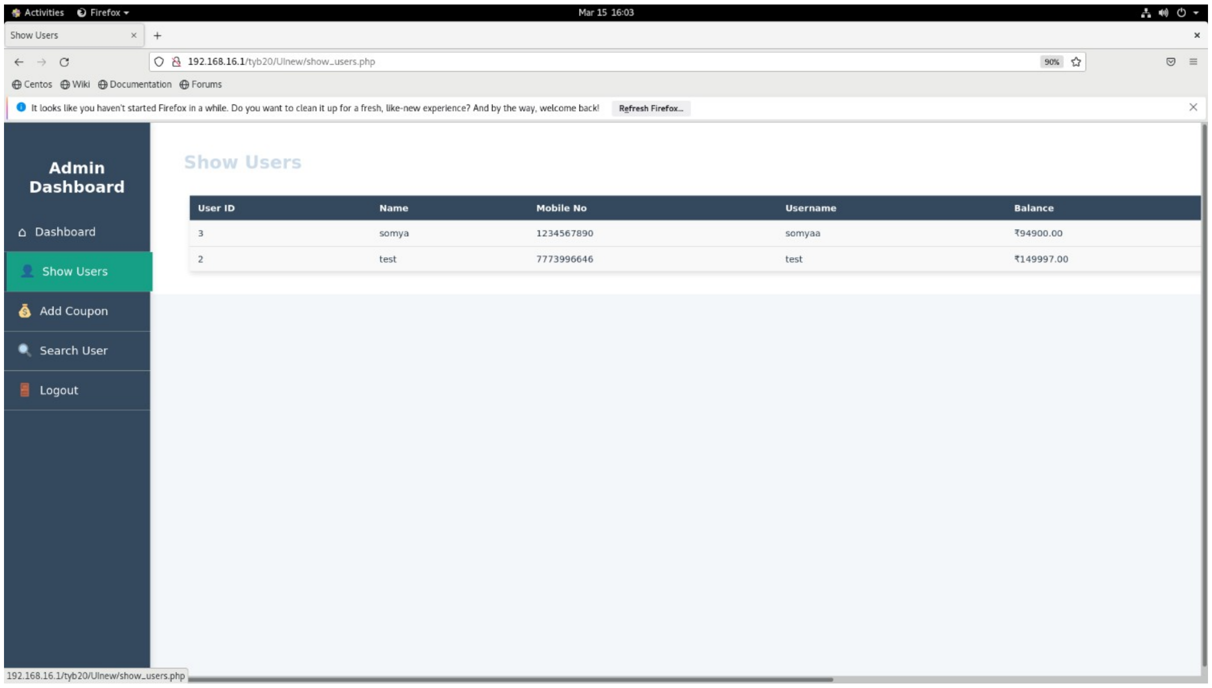
Welcome, admin!

Select an option from the sidebar to manage users and coupons.

Admin Dashboard:Add Users

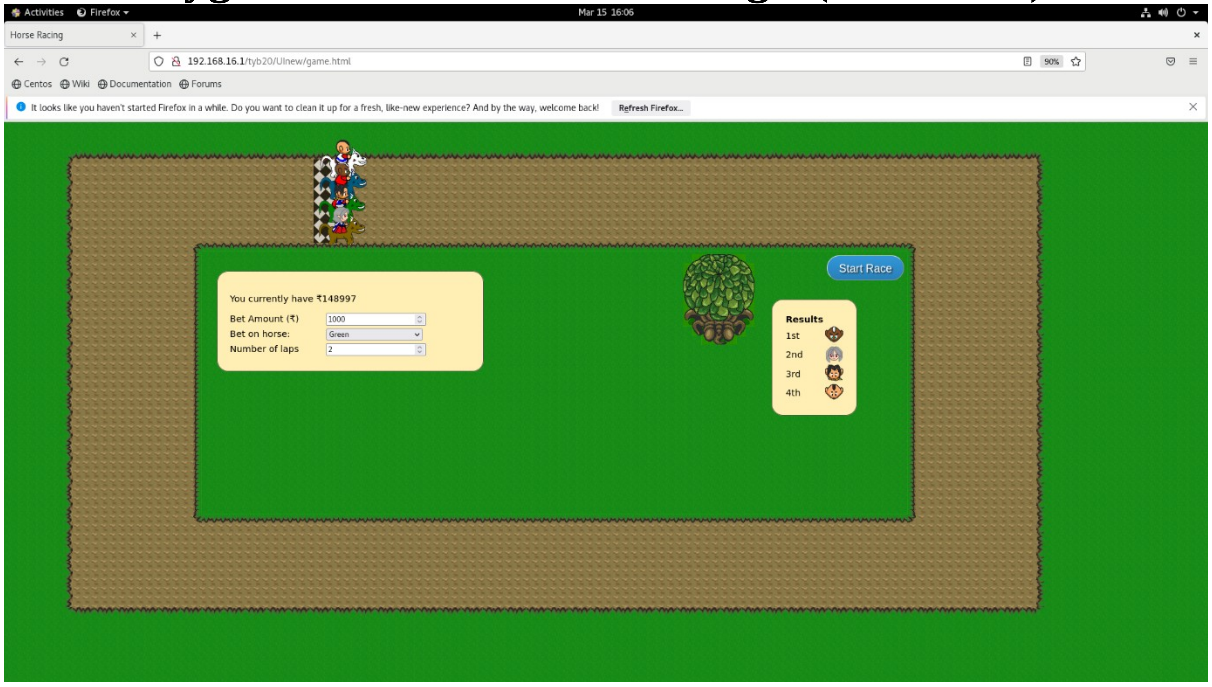


Admin Dashboard:Show Users


Activities
Firefox
Mar 15 16:03
Show Users
192.168.16.1/tyb20/UInew/show_users.php
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Admin Dashboard
Dashboard
Show Users
Add Coupon
Search User
Logout
Show Users
192.168.16.1/tyb20/UInew/show_users.php

User ID	Name	Mobile No	Username	Balance
3	somya	1234567890	somyaa	₹94900.00
2	test	7773996646	test	₹149997.00

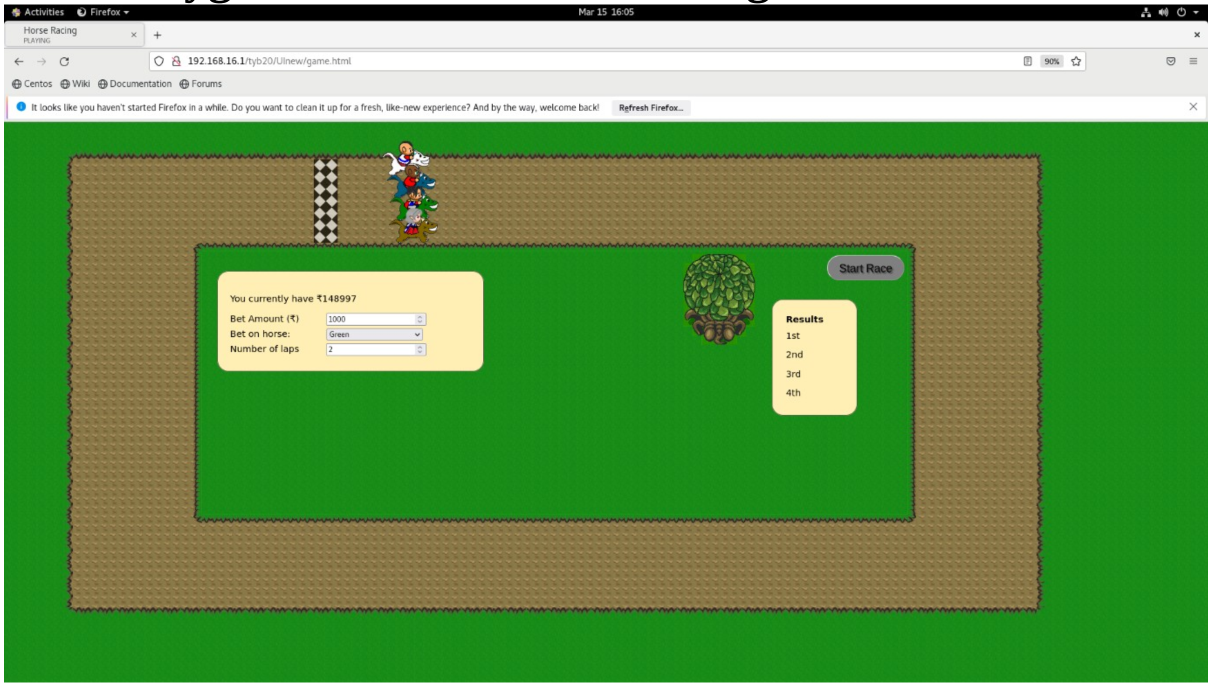
Race Playground Interface:Move Right(Star Race):Start


Activities
Firefox
Mar 15 16:06
Horse Racing
192.168.16.1/tyb20/UInew/game.html
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Start Race
Results
1st
2nd
3rd
4th

You currently have ₹148997

Bet Amount (₹)	1000
Bet on horse:	Green
Number of laps	2

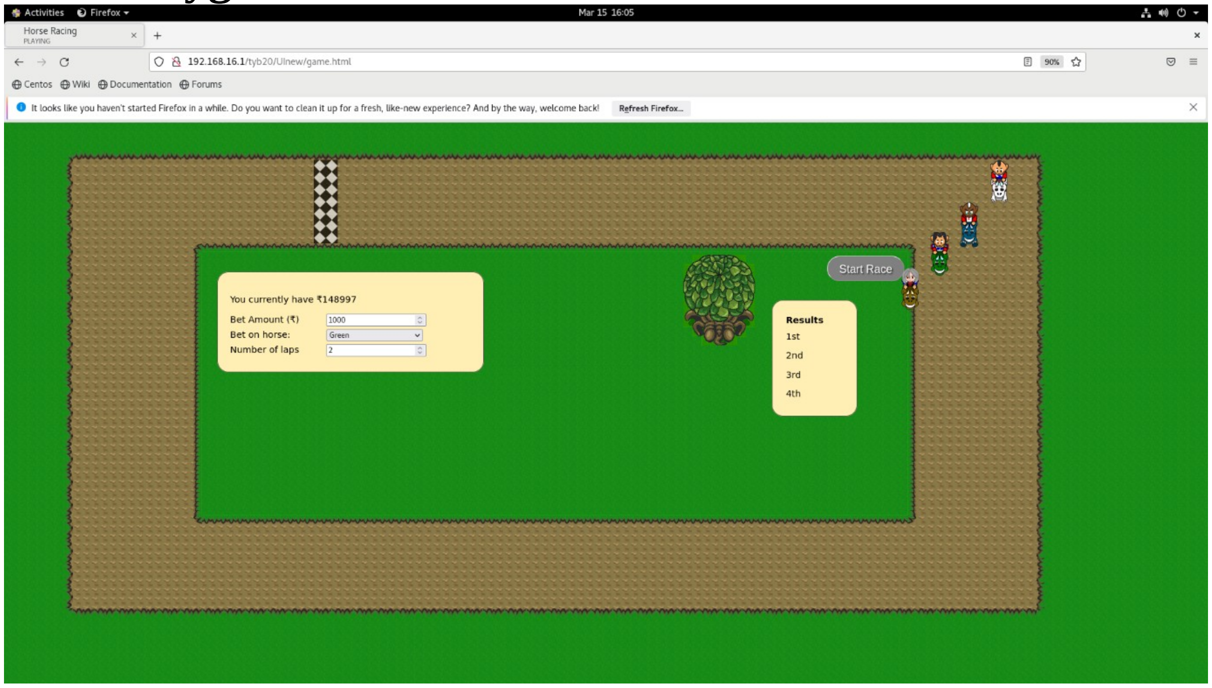
Race Playground Interface:Move Right


Activities
Firefox
Mar 15 16:05
Horse Racing
PLAYING
192.168.16.1/tyb20/UInew/game.html
Centos
Wiki
Documentation
Forums
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!
Refresh Firefox...
Start Race
Results
1st
2nd
3rd
4th

You currently have ₹148997

Bet Amount (₹)	1000
Bet on horse:	Green
Number of laps	2

Race Playground Interface:Move Down



192.168.16.1/tyb20/UInew/game.html

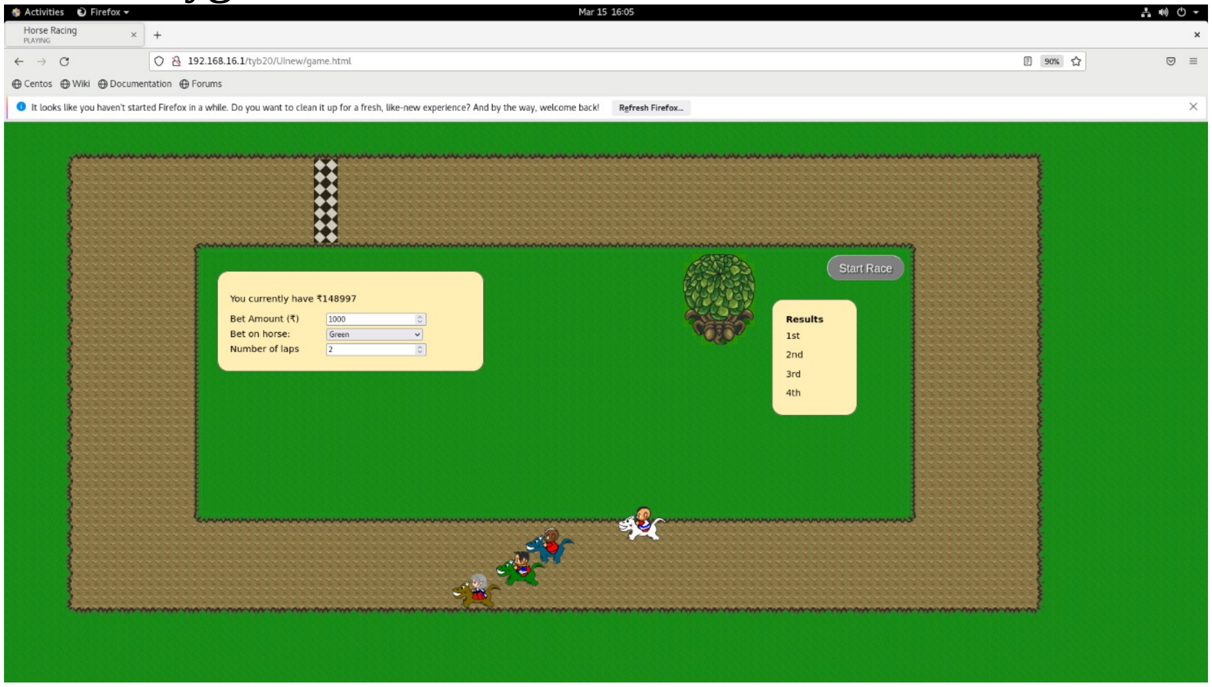
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

You currently have ₹148997

Bet Amount (₹)	1000
Bet on horse:	Green
Number of laps	2

Results
1st
2nd
3rd
4th

Race Playground Interface:Move Left



192.168.16.1/tyb20/UInew/game.html

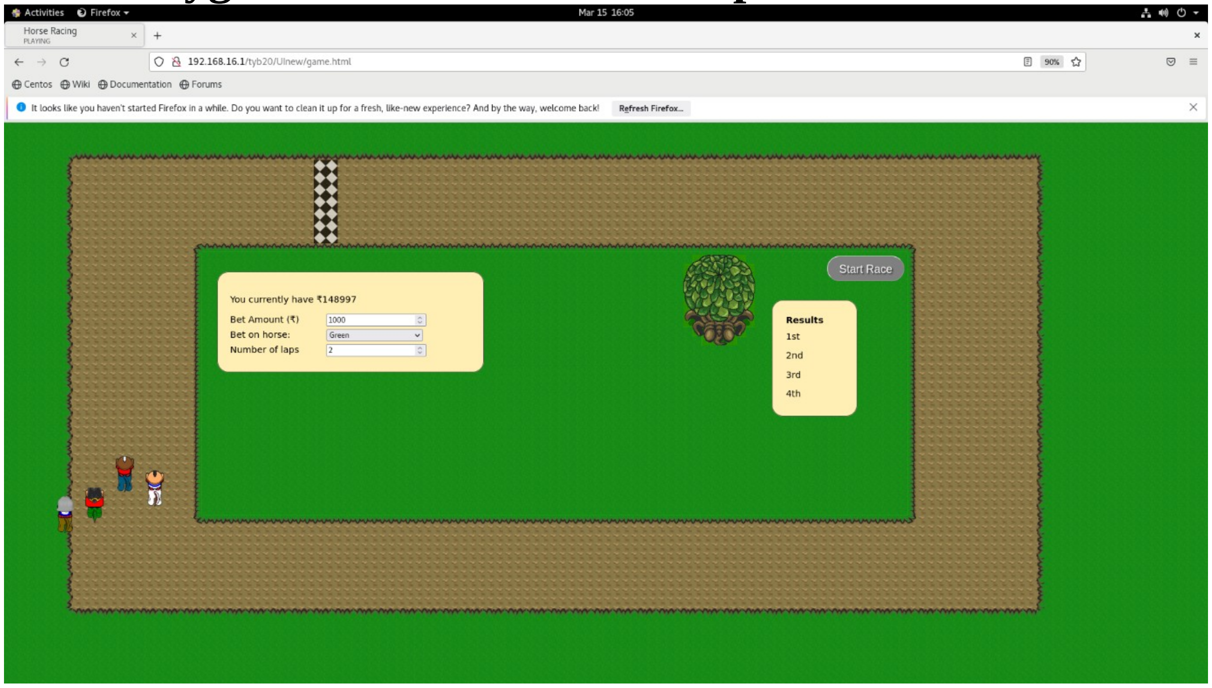
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

You currently have ₹148997

Bet Amount (₹)	1000
Bet on horse:	Green
Number of laps	2

Results
1st
2nd
3rd
4th

Race Playground Interface:Move Up



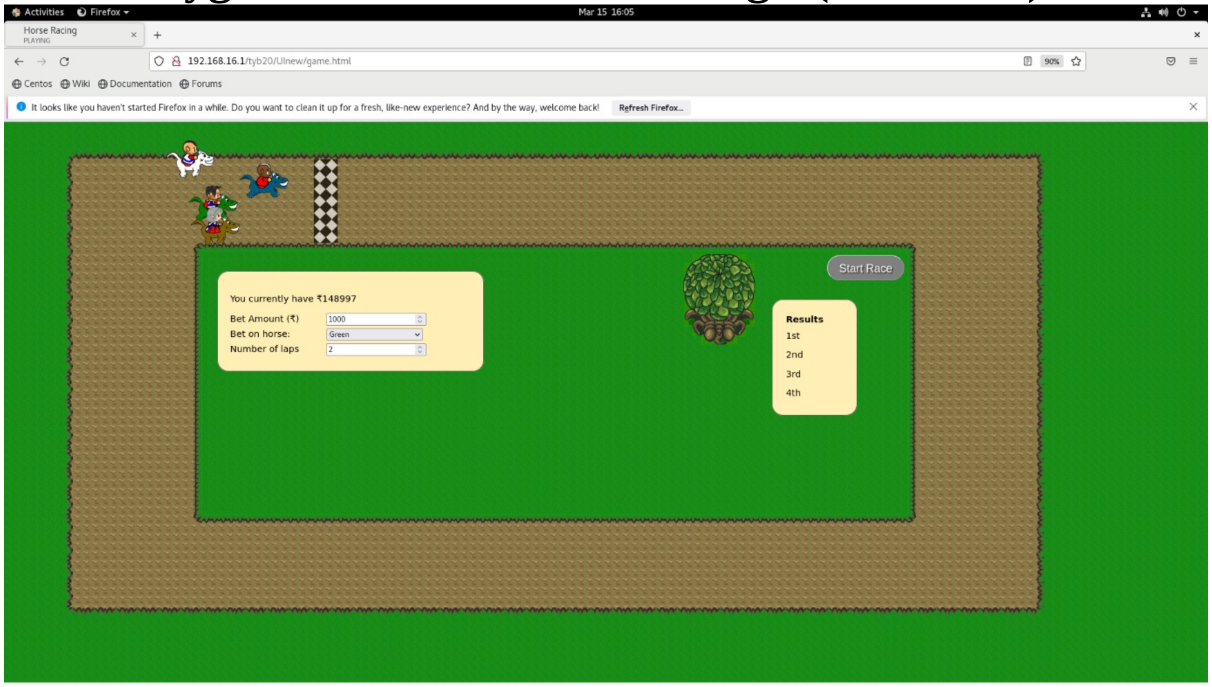
It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

You currently have ₹148997

Bet Amount (₹)	1000
Bet on horse:	Green
Number of laps	2

Results
1st
2nd
3rd
4th

Race Playground Interface:Move Right(End Race):End



It looks like you haven't started Firefox in a while. Do you want to clean it up for a fresh, like-new experience? And by the way, welcome back!

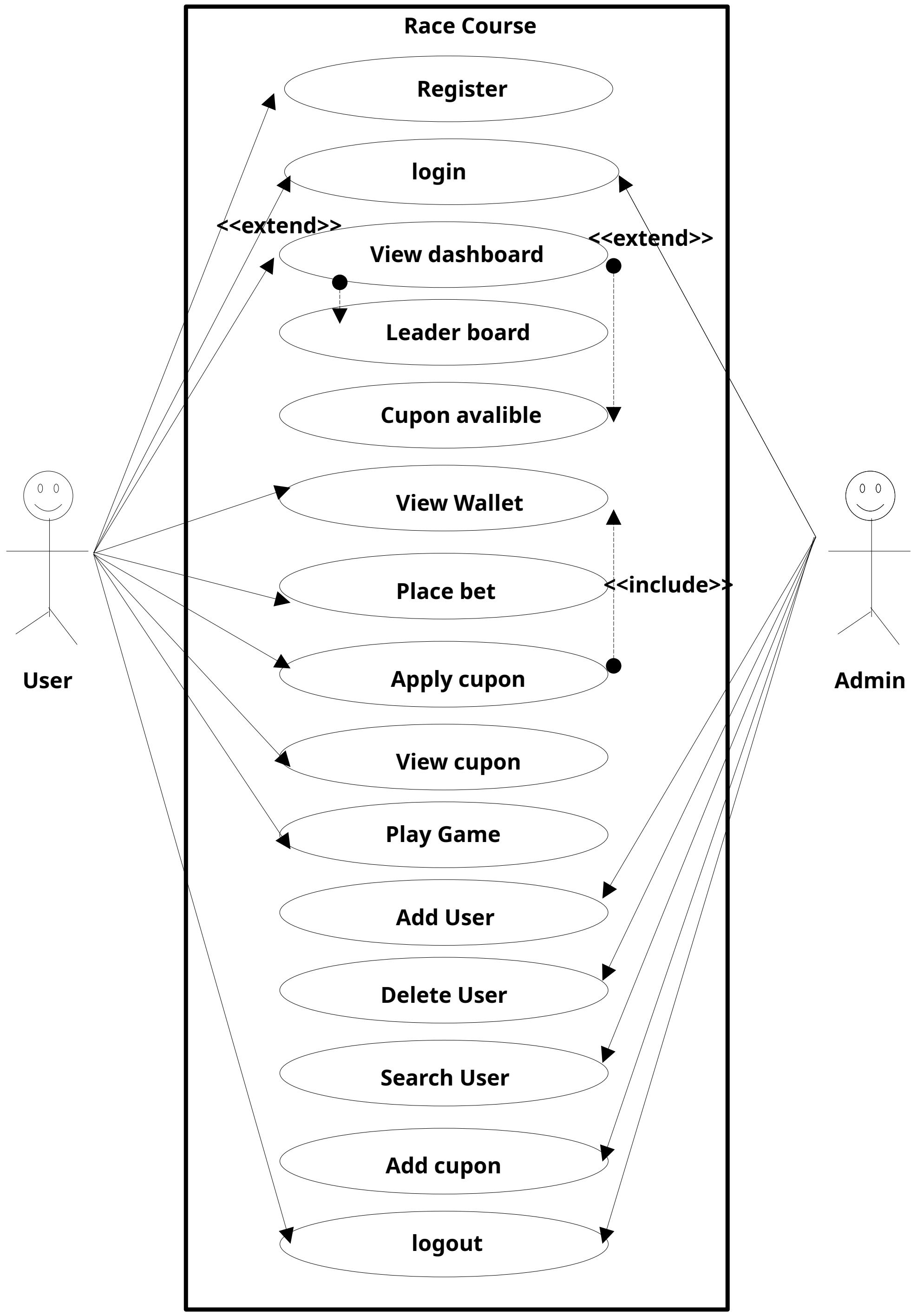
You currently have ₹148997

Bet Amount (₹)	1000
Bet on horse:	Green
Number of laps	2

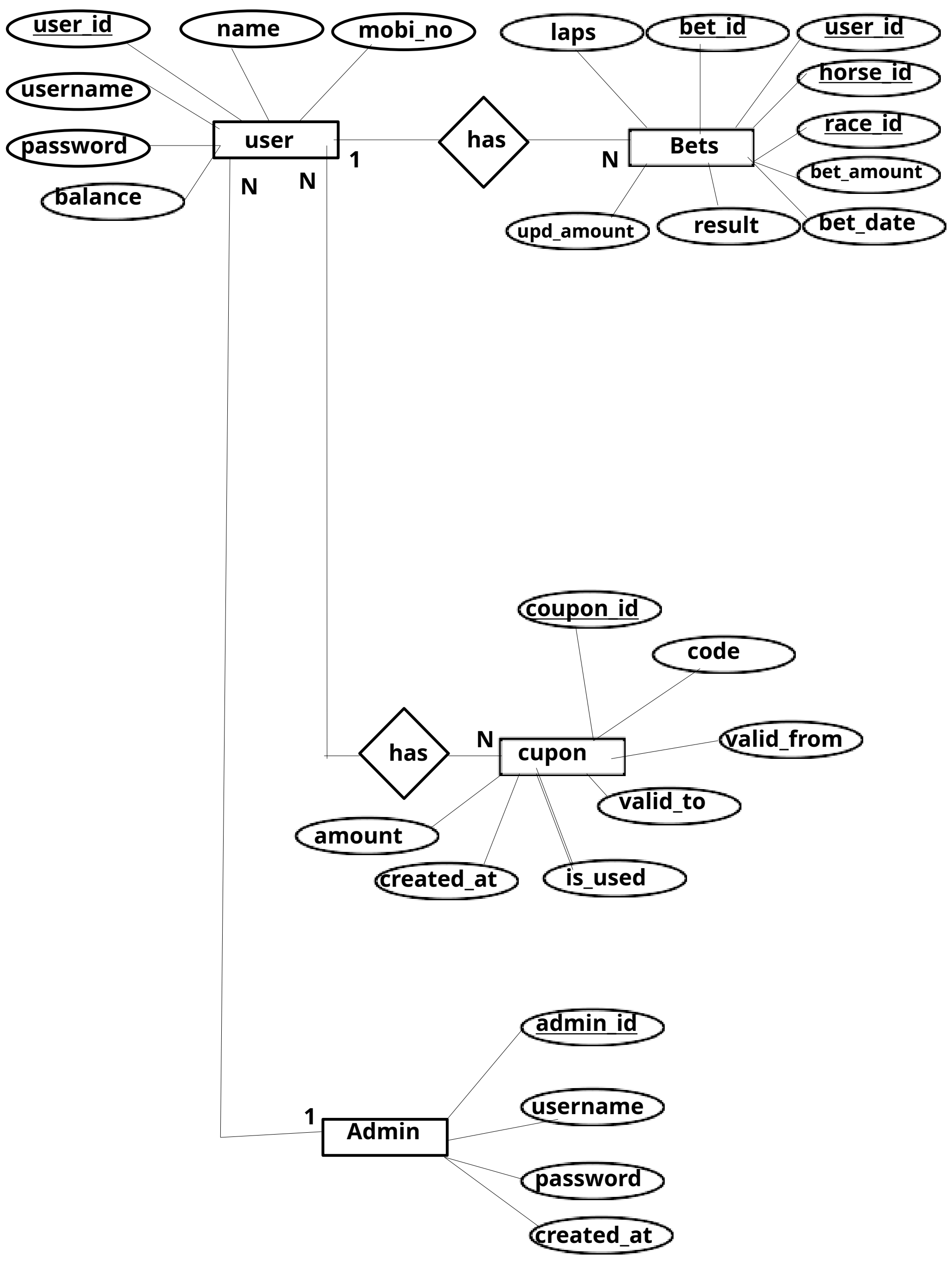
Results
1st
2nd
3rd
4th

4. Diagrams

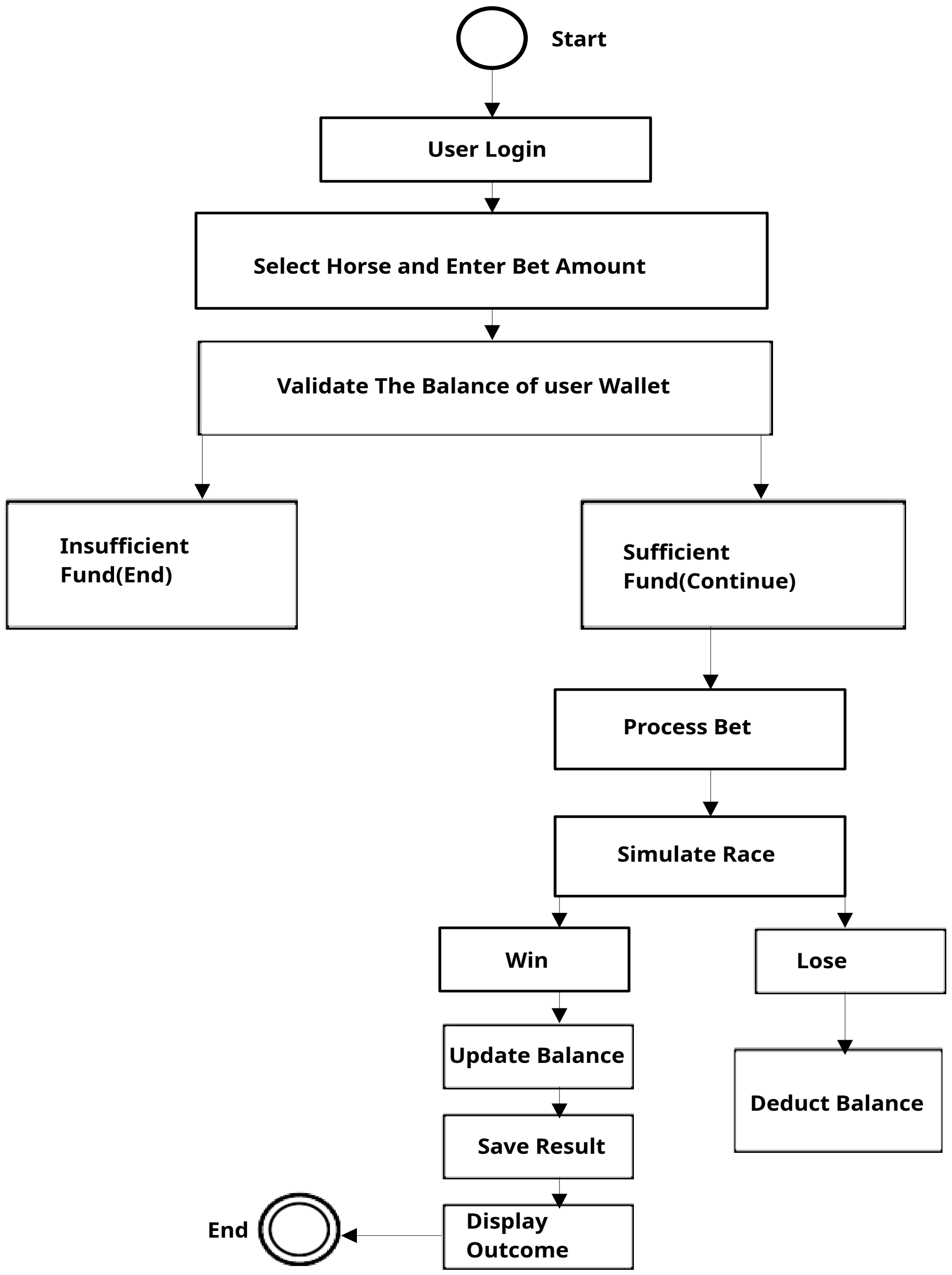
4.1 Use Case Digram



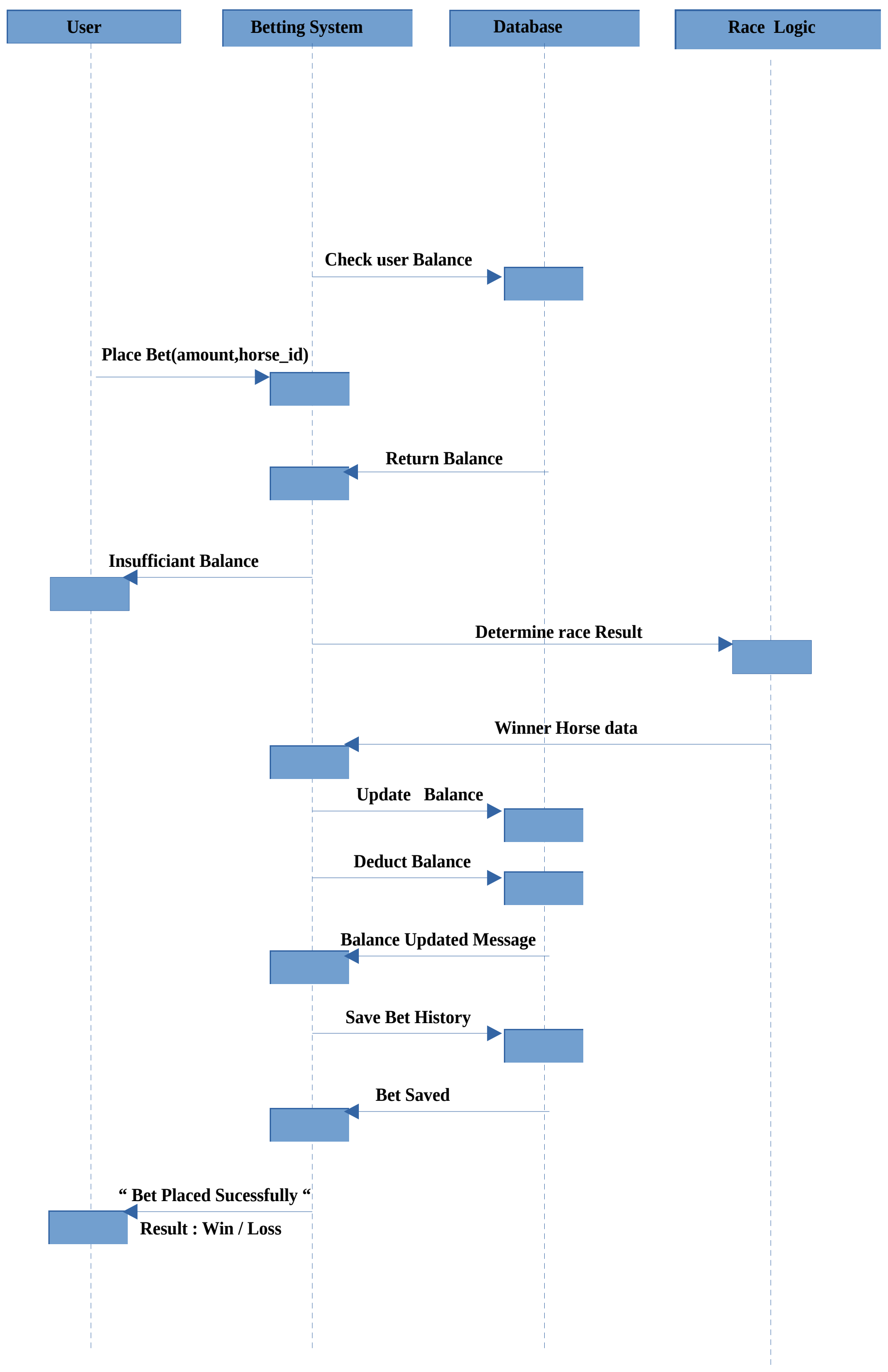
4.2 Entity Relationship Diagram



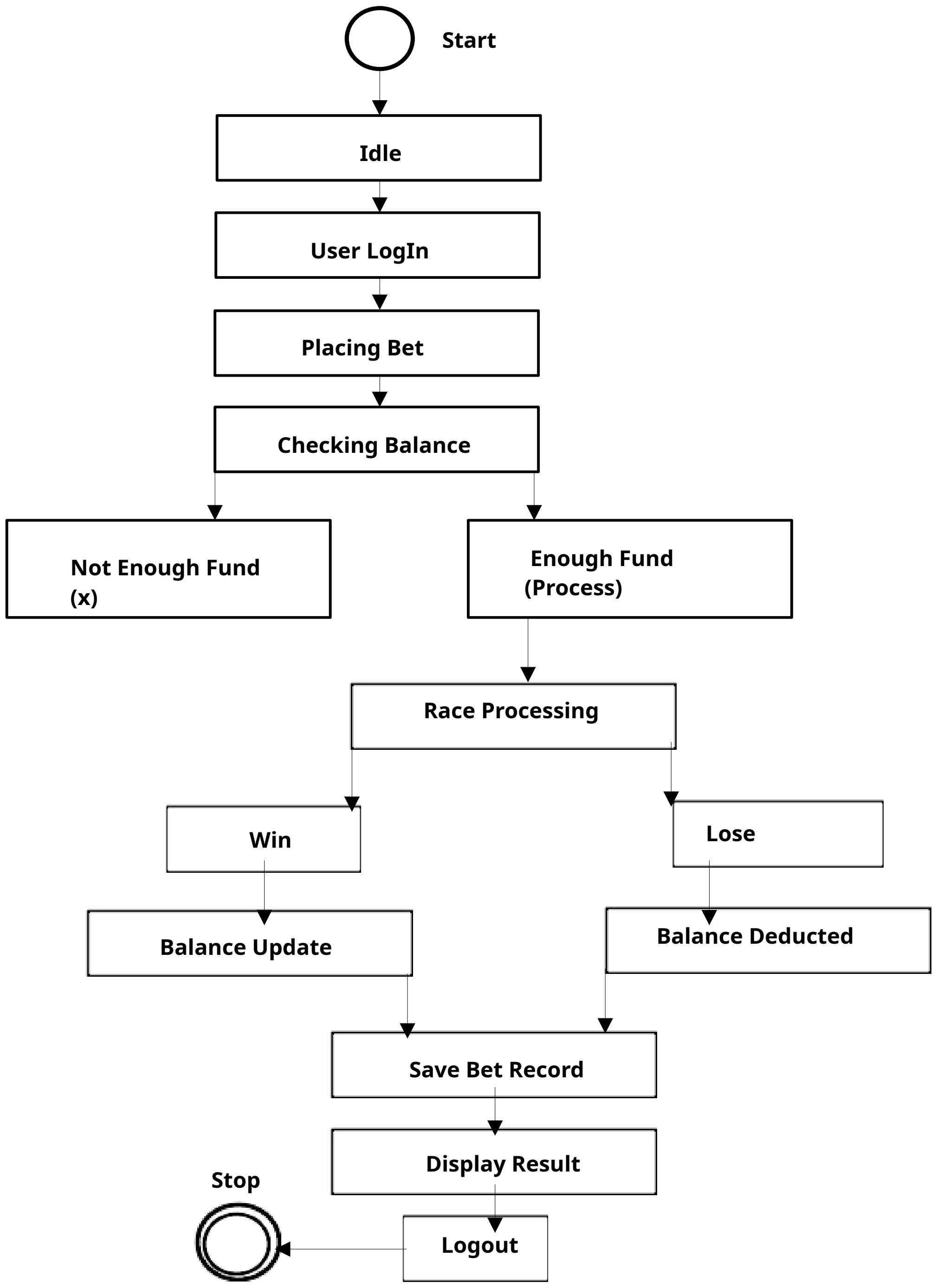
4.3 Activity Diagram



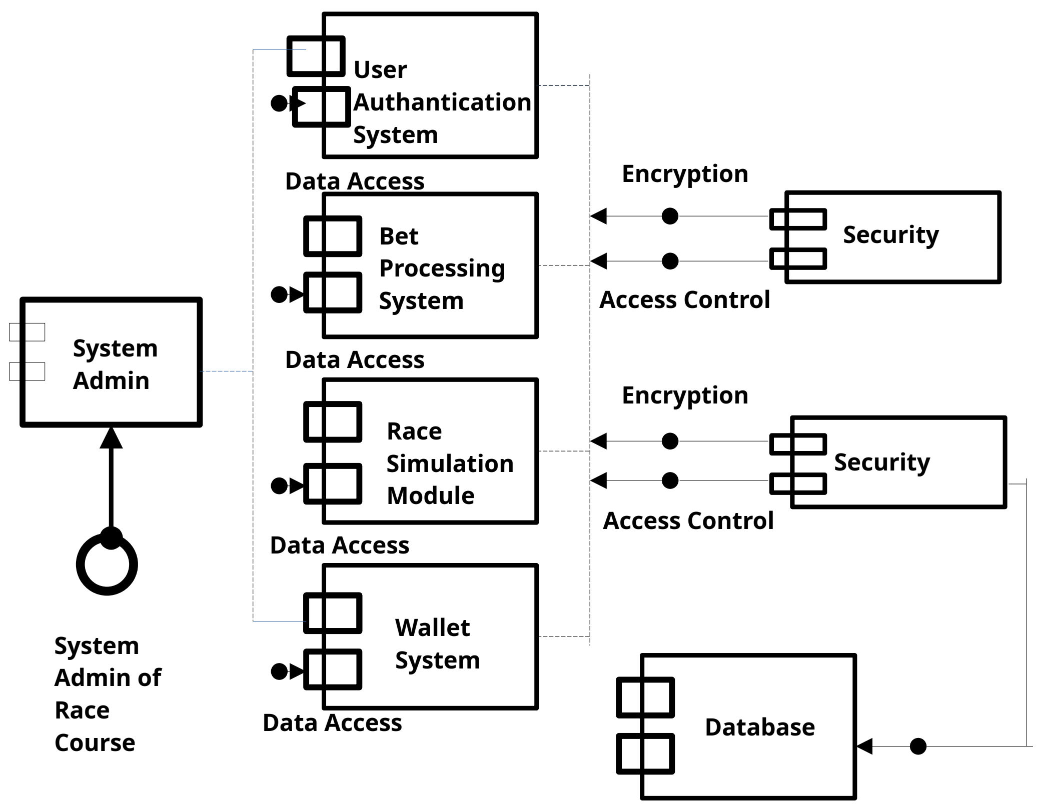
4.4 Sequence Diagram



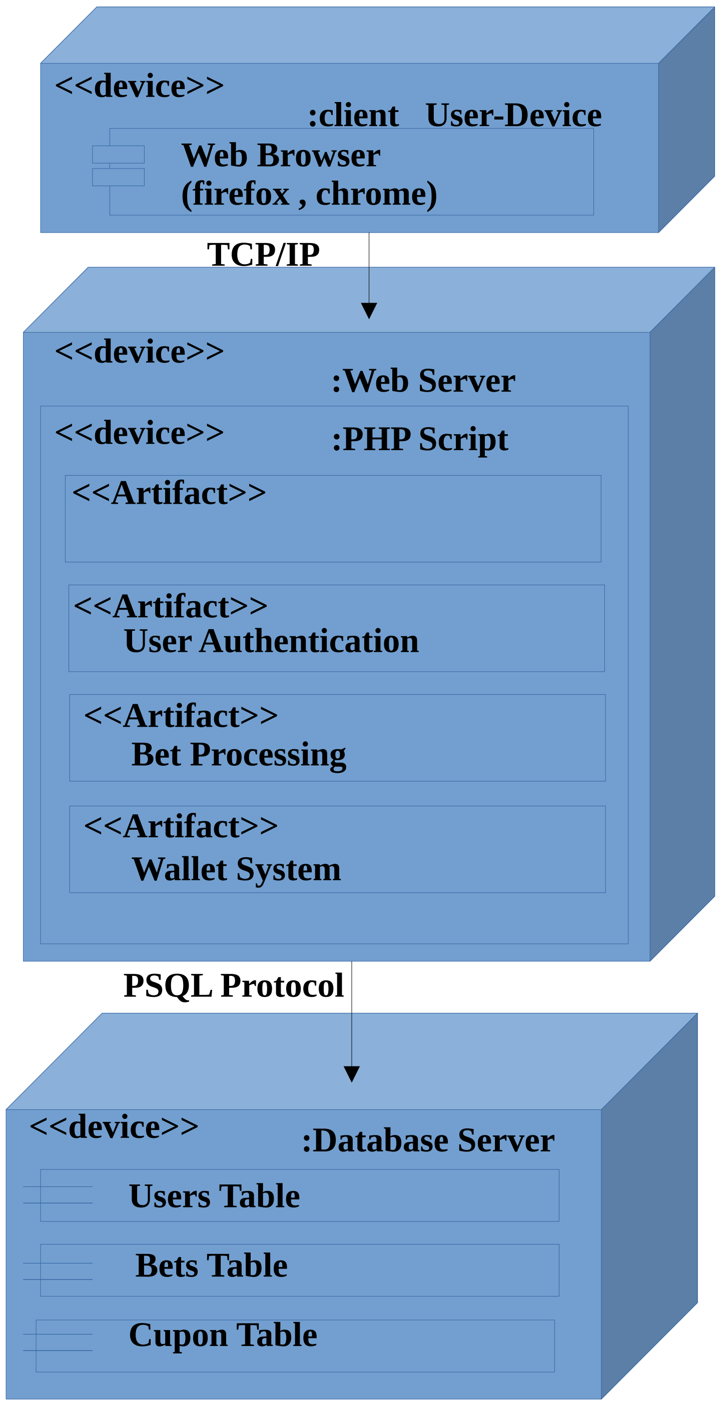
4.5 State Diagram



4.6 Component Diagram



4.7 Deployment Diagram



5. CODING

5.1 HARDWARE SPECIFICATION

Component	Specification
Processor	Intel Core i5 or higher
RAM	Minimum 8 GB
Hard Disk	500 GB HDD or 256 GB SSD
Monitor	15.6" HD Display or higher
Network Adapter	Ethernet / Wi-Fi enabled
Keyboard & Mouse	Standard Input Devices

5.2 Platform:

Component	Name and Version
Operating System	Windows 10 / Ubuntu 20.04 LTS
Web Server	Apache 2.4 / Nginx 1.18
Backend Language	PHP 8.1
Database Server	PostgreSQL 13
Frontend	HTML5, CSS3, JavaScript
Browser	Google Chrome v110+ / Firefox v100+
Text Editor	Visual Studio Code / Sublime Text

5.3 Programming Languages Used:

Language	Description
HTML5 (HyperText Markup Language)	HTML5 is the standard language used to create and structure content on the web. In the Horse Race Game, HTML5 is used to design the layout of pages like login, wallet, game interface, dashboard, and profile. It includes structural elements like `<form>`, `<div>`, `<input>`, and `<button>` to capture user input and display data. HTML5 also supports embedding media, canvas, and responsive design elements.
CSS3 (Cascading Style Sheets)	CSS3 is used to style and visually enhance the HTML elements. It handles the overall look and feel of the web application including color themes, font styles, spacing, layout design, and responsiveness. In your project, CSS3 is used to create visually appealing interfaces such as the sidebar, wallet card designs, button animations, hover effects, and media queries for mobile responsiveness.
JavaScript	JavaScript is a client-side scripting language used to bring interactivity and dynamic behavior to the web pages. In your project, JavaScript is used for basic input validations, toggling UI elements, and could be extended for animating the horse race game, tracking race progress, or adding timer/countdown features in the game. It enhances the user experience without requiring full page reloads.
PHP (Hypertext Preprocessor)	PHP is a server-side scripting language that powers the backend logic of the application. It manages user sessions, handles form submissions (e.g., login, applying coupons), connects to the PostgreSQL database, and processes game transactions. PHP scripts like `wallet.php`, `login.php`, `apply_coupon.php`, and `db.php` form the business logic core of your application.

SQL (Structured Query Language)	SQL is used to interact with the PostgreSQL database. It performs operations like retrieving wallet balances, inserting user data, updating race results, and querying betting statistics. SQL commands such as `SELECT`, `INSERT`, `UPDATE`, and `DELETE` are commonly used across the backend PHP scripts.
PL/pgSQL (Procedural Language/PostgreSQL)	PL/pgSQL is PostgreSQL's procedural extension to SQL. It is used to write stored procedures, functions, and triggers to automate backend tasks such as automatically updating wallet balances after a race, handling transactions safely, or applying conditional coupon logic. This enhances performance and ensures data consistency.

5.4 Coding Style Followed:

To ensure consistency, readability, maintainability, and professional structure, specific coding styles and design principles were followed throughout the development of the **Horse Race Game** project. These include both the **Page Structure Design** and **Page Layout Presentation Design**, as described below:

1) Page Structure Design:

- **Modular File Organization**:
All files are logically separated based on functionality. PHP scripts handle backend processing (`wallet.php`, `apply_coupon.php`, `login.php`), while static resources like CSS and images are stored in designated folders.
- **Consistent Naming Conventions**:
Files, variables, functions, and class names follow consistent and meaningful naming patterns (e.g., `user_id`, `apply_coupon.php`). Snake_case is used for variables and file names, improving clarity.
- **Separation of Concerns (SoC)**:
Frontend design (HTML/CSS), backend logic (PHP), and database operations

(PostgreSQL/SQL) are kept distinct to maintain clean code and reduce dependencies.

- **Session Management**:
User session handling is incorporated using `session_start()` and proper redirects for authentication and security.
- **Secure Database Access**:
Database interactions use `pg_query_params()` to prevent SQL injection, promoting secure coding practices.

2) Page Layout Presentation Design:

- **Responsive Design with CSS3**:
The layout is fully responsive using media queries, making it accessible on desktops, tablets, and mobile devices. Elements like sidebars, buttons, and forms adjust dynamically based on screen size.
- **Consistent Color Theme and Typography**:
The UI follows a consistent color palette (e.g., dark blue sidebars, green buttons) and uses readable fonts like `'Segoe UI'` for a modern, clean appearance.
- **Card-Based Component Design**:
Wallet balances, input forms, and actions are enclosed in card-like containers with shadows and border-radius for a smooth, 3D effect and visual grouping.
- **UI/UX Principles**:
Layouts follow clear navigation structures. The sidebar provides quick access to different pages. Hover effects, clickable buttons, and transitions enhance interactivity.
- **Accessibility Considerations**:
Font sizes are legible, color contrasts are accessible, and form inputs are appropriately labeled for usability and accessibility.

This structured coding style ensures that the application is **user-friendly**, **visually engaging**, and **technically sound** for further development or scaling.

6.1 Test Case Design :

Test Case ID	Test Case Description	Test Steps	Expected Result	Status
TC001	User Login with Valid Credentials	1. Open login page 2. Enter correct username and password 3. Click "Login"	User is redirected to dashboard	Pass
TC002	User Login with Invalid Credentials	1. Open login page 2. Enter incorrect username or password 3. Click "Login"	Error message is shown, user remains on login page	Pass
TC003	Access Wallet Page (Authenticated User)	1. Login with valid credentials 2. Click on Wallet in sidebar	Wallet page is displayed with current balance	Pass
TC004	Access Wallet Page (Unauthenticated User)	1. Open wallet.php directly without login	User is redirected to login page	Pass
TC005	Apply Valid Coupon	1. Login 2. Go to Wallet page 3. Enter valid coupon code 4. Click "Apply"	Balance is updated and success message is displayed	Pass
TC006	Apply Invalid Coupon	1. Login 2. Go to Wallet page 3. Enter invalid/expired coupon code 4. Click "Apply"	Error message is shown, balance remains unchanged	Pass
TC007	Navigate to Game Page	1. Login 2. Click "Play" from sidebar	Game page loads and displays racing UI	Pass
TC008	Logout Functionality	1. Login 2. Click "Logout" from sidebar	User is logged out and redirected to login page	Pass

TC009	SQL Injection Prevention in Login	1. Enter SQL injection string like `' OR '1'='1` in username/password field 2. Click "Login"	Login fails, system remains secure	Pass
TC010	Responsive Design Test (Mobile View)	1. Open website on a mobile device or use browser dev tools to simulate mobile screen	Layout adjusts, sidebar collapses, content fits the screen	Pass

7. Limitations and Future Enhancements:

7.1 Limitations:

While the current version of the Horse Race Game platform offers a functional betting system with user management and wallet integration, it still has some limitations:

Limitation	Description
Limited Game Mechanics	The current horse race game has basic logic and animations. It lacks advanced game features like real-time multiplayer support, dynamic odds, or complex AI.
No Real-Time Updates	There is no live update mechanism (e.g., WebSocket integration) to show real-time game or balance changes without page reloads.
Static Admin Features	Admin tasks like issuing certificates or verifying users must be done manually through the backend or email, reducing efficiency.
Coupon System Constraints	The coupon system is simple and may not support advanced features like expiry dates, usage limits, or coupon tracking.
No In-Depth Analytics	User activity, game statistics, and betting patterns are not yet tracked or analyzed in a detailed manner.
Limited Mobile Optimization	While responsive, the platform might not offer the best user experience on all small screen devices or across different browsers.

Security Considerations	While basic validation and authentication are in place, advanced security measures like CSRF tokens, rate limiting, and two-factor authentication are missing.

7.2 Future Enhancements:

To improve the platform's usability, scalability, and overall functionality, the following enhancements are planned:

Enhancement	Description
Real-Time Gameplay	Implement real-time race simulations using WebSockets or similar technologies to enhance interactivity.
Leaderboard and Rewards System	Introduce a leaderboard for competitive play and reward systems like daily bonuses or achievements.
Advanced Admin Dashboard	Provide an admin panel with features like coupon creation, user analytics, game control, and reports.
Mobile App Development	Develop a dedicated Android/iOS app for seamless mobile access and better performance.
Secure Payment Gateway Integration	Add functionality for users to load money into their wallets securely through payment gateways.
AI-Powered Recommendations	Implement AI algorithms to suggest bets or coupons based on user behavior.
Multilingual Support	Add support for multiple languages to reach a broader audience.
Gamification Elements	Introduce levels, points, badges, and animations to improve user engagement.
Advanced Coupon Management	Enhance the coupon system with expiry dates, usage limits, and automatic validation.
Detailed User and System Analytics	Integrate tools to track user behavior, game performance, and server health.

8. Conclusion:

The **Horse Race Game** project marks the successful development of a dynamic, interactive, and secure online betting system designed for entertainment and engagement. It combines PHP, PostgreSQL, HTML, CSS, and JavaScript to deliver a user-friendly platform that allows players to participate in virtual horse races, manage their wallets, and apply bonus coupons efficiently.

Through this project, we explored critical aspects of web-based application development — including user authentication, database design, responsive UI/UX, and secure data handling. The system is designed to be intuitive for both users and administrators, enabling smooth navigation, efficient gameplay, and easy management of user data.

This project not only provided an opportunity to enhance technical skills in web technologies and database management but also gave insights into real-world application requirements such as usability, scalability, and data integrity.

While the platform fulfills its core objectives, it also opens the door for future enhancements like real-time gameplay, advanced analytics, secure payment integration, and mobile application development. With continued iterations and improvements, this project has the potential to evolve into a fully featured, scalable gaming platform that offers an engaging experience to users of all backgrounds.

In conclusion, the Horse Race Game stands as a testament to the blend of creativity and technology, proving how innovative digital solutions can be built to entertain, engage, and inspire users.

9. References and Bibliography:

The following resources and references were used during the research, development, and implementation of the **Horse Race Game** project:

Web Resources:

1. **PHP Official Documentation**
   https://www.php.net/manual/en/
   – For understanding PHP syntax, server-side scripting, and session handling.
2. **PostgreSQL Documentation**
   https://www.postgresql.org/docs/
   – For database design, SQL queries, and data management concepts.
3. **W3Schools**
   https://www.w3schools.com/
   – For HTML, CSS, JavaScript basics and examples of UI/UX design patterns.
4. **Stack Overflow**
   https://stackoverflow.com/
   – For troubleshooting code issues, understanding best practices, and seeking programming advice.
5. **MDN Web Docs (Mozilla Developer Network)**
   https://developer.mozilla.org/
   – For detailed technical documentation of HTML, CSS, and JavaScript.
6. **Bootstrap Framework**
   https://getbootstrap.com/
   – For layout structuring and responsive design references.
7. **GitHub**
   https://github.com/
   – For code version control, exploring similar projects, and project collaboration ideas.

Books and Academic References:

1. **"Learning PHP, MySQL & JavaScript" by Robin Nixon**
– An essential guide for developing dynamic web applications using server-side and client-side scripting.
2. **"Database System Concepts" by Abraham Silberschatz, Henry F. Korth, and S. Sudarshan**
– For understanding relational database design, normalization, and query optimization.
3. **"Software Engineering: A Practitioner's Approach" by Roger S. Pressman**
– For methodologies in software development, feasibility study, UML diagrams, and testing strategies.

College Materials and Lecture Notes:

- Department of Computer Science – Fergusson College
– Class notes and faculty presentations related to web development, database systems, and project development.