

**A
PROJECT REPORT
ON
PRIME BID
(Online Auction Platform)**



**SAVITRIBAI PHULE PUNE UNIVERSITY
In Partial Fulfillment of
MASTERS IN COMPUTER APPLICATION**

**BY
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Sinhgad Institutes

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This is to certify that the project report entitled “**PRIME BID (ONLINE AUCTION PLATFORM)**” submitted to the Department of MCA, **Sinhgad Institute of Business Administration and Research** in partial fulfillment of the requirement for the award of the degree of MASTER OF COMPUTER APPLICATIONS (Affiliated to Savitribai Phule Pune University), is an original work carried out by

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1. INTRODUCTION

1.1 Company Profile

Gargi Linux Access is a dynamic and innovative tech solutions company committed to delivering high-quality digital services and software solutions. Founded with a vision to empower businesses through open-source technologies and customized IT services, Gargi Linux Access specializes in areas such as web development, software solutions, IT consulting, and digital transformation. The company emphasizes reliability, user-centric design, and cost-effective solutions, making it a trusted partner for clients across various industries. With a team of skilled professionals and a passion for technology, Gargi Linux Access continuously strives to stay ahead of trends and contribute to the growth of the digital ecosystem.

1.2 Abstract

PrimeBid – Auction Platform is a web-based system that enables users to participate in auctions either as sellers or buyers. The platform is built using a modern technology stack — Node.js for the backend, React.js for the frontend, and MongoDB for the database. The aim is to offer a transparent, secure, and user-friendly auction experience.

Users can register, list items for auction, and place bids on available products. Auctions are time-bound, and once the bidding timer ends, the highest bidder wins. The system automatically processes this outcome and updates the item status. Admins have full control over the platform, including user and auction management. The project emphasizes real-time interaction, role-based access, and intuitive design.

1.3 Existing System and Need for System

Traditional auction systems, whether physical or online, often involve complex registration procedures, third-party involvement, or high service fees. Platforms like eBay are widely used but may not be beginner-friendly or suitable for localized or small-scale sellers.

The need for a dedicated, lightweight, and straightforward auction platform is significant. Many users prefer minimal interfaces with essential features and security. PrimeBid fills this gap by offering:

- Direct seller-to-buyer auctioning.
- Real-time bidding with countdown timers.
- Simplicity and security without unnecessary complexity.

This system is tailored for users who want to list or buy items in a secure, time-bound, and transparent digital environment.

1.4 Scope of the System

The system includes the following functional coverage:

- User Authentication: Secure login and signup using token-based authentication.
- Role Management: Admin, Seller, and Buyer roles with different permissions.
- Auction Management: Sellers can add auctions with descriptions, images, and start/end times.
- Bidding System: Buyers can view available auctions and place bids in real time.
- Real-Time Updates: Auction countdown and bid tracking are updated live.
- Winner Declaration: The system automatically finalizes the highest bidder once the timer ends.
- Admin Dashboard: Admins can monitor auctions, users, and manage reported issues.

1.5 Operating Environment – Hardware and Software

Hardware Requirements:

- Processor: Intel i5 or higher
- RAM: Minimum 8 GB
- Hard Disk: At least 100 GB free space
- Network: Reliable internet connection for real-time operations

Software Requirements:

- Frontend Development: ReactJS
- Backend Development: Node.js + Express.js
- Database: MongoDB (NoSQL)
- Code Editor: Visual Studio Code
- Version Control: Git & GitHub
- API Testing Tool: Postman
- Browser: Google Chrome (for testing and access)

1.6 Brief Description of Technology Used

1.6.1 Operating Systems Used (Windows or Unix)

- The system was developed and tested on both Windows 10 and macOS.
- It is platform-independent, as it is browser-based.
- The development environment used Node.js, which runs smoothly on any OS with proper configuration.

1.6.2 RDBMS / NoSQL Used to Build Database (MySQL / Oracle / Teradata, etc.)

- MongoDB was used as the NoSQL database for this project.
- MongoDB allows flexible schema design, making it ideal for storing data like auctions, bids, users, and payment proofs.
- The database is hosted on MongoDB Atlas for easy cloud access and scalability.

2. PROPOSED SYSTEM

2.1 Study of Similar Systems

Several online auction platforms already exist, such as eBay, AuctionZip, HiBid, Proxibid, and Bidsquare, each offering users a way to participate in live or scheduled auctions. However, these systems come with notable limitations:

- eBay: Overwhelming for new users due to complexity, high seller fees, and ongoing issues with fraud and customer service.
- AuctionZip: Primarily focused on live, in-person auctions, limiting remote accessibility.
- HiBid: Offers online features but is often criticized for poor user experience and limited listings.
- Proxibid: Complicated registration, high transaction fees, and limited global accessibility.
- Bidsquare: Niche-focused (mostly art and antiques), smaller user base, and scalability concerns.

These platforms generally lack a simplified interface for beginners, real-time system feedback, and a flexible structure for smaller communities.

PrimeBid is designed to overcome these problems with:

- A simple, modern UI using ReactJS.
- Role-based access for Admins, Sellers, and Bidders.
- Real-time bidding logic handled by Node.js and Express.
- A document-oriented database (MongoDB) for flexibility and scalability.
- Transparent auction flow with minimal user friction.

2.2 Feasibility Study

Technical Feasibility

PrimeBid uses widely supported technologies:

- Frontend: ReactJS
- Backend: Node.js with Express.js
- Database: MongoDB (NoSQL)

These are all open-source, lightweight, and suitable for scalable applications.

Operational Feasibility

- The system is designed with clear user roles and intuitive workflows:
- Sellers can easily list products with images and auction rules.
- Buyers can register, bid in real-time, and receive notifications.
- Admins have full control through a separate dashboard.
- The system is platform-independent and works smoothly on any modern web browser.

Economic Feasibility

- All tech used is open-source, removing licensing costs.
- Hosting costs are minimal with deployment on local or cloud-based servers.
- The long-term cost of maintaining the system is low, making it viable even for individual use or small startups.

2.3 Objectives of Proposed System

The main objectives of PrimeBid are:

- To create a secure, responsive online platform for time-bound auctions.
- To support multiple user roles: Super Admin, Seller, and Bidder.
- To enable sellers to create and manage auction listings.
- To allow bidders to place bids with live feedback.
- To implement real-time auction updates and final winner announcements.
- To simplify the payment proof upload and verification process.
- To provide a full-featured Admin Dashboard for platform monitoring and management.

2.4 Users of the System

- Seller: Can create and manage auction listings with item descriptions, images, starting bids, and deadlines.
- Bidder: Can browse ongoing auctions and place bids in real-time. Receives notifications about being outbid or winning.
- Admin: Manages platform users, auctions, transactions, and can resolve disputes or monitor site activity.
- Super Admin (optional role depending on implementation): Higher-level control over Admin accounts and platform configurations.

3. ANALYSIS AND DESIGN

3.1 System Requirements

Requirement analysis is the foundation for designing any system. For PrimeBid, both functional and non-functional requirements are identified based on user roles and auction workflows.

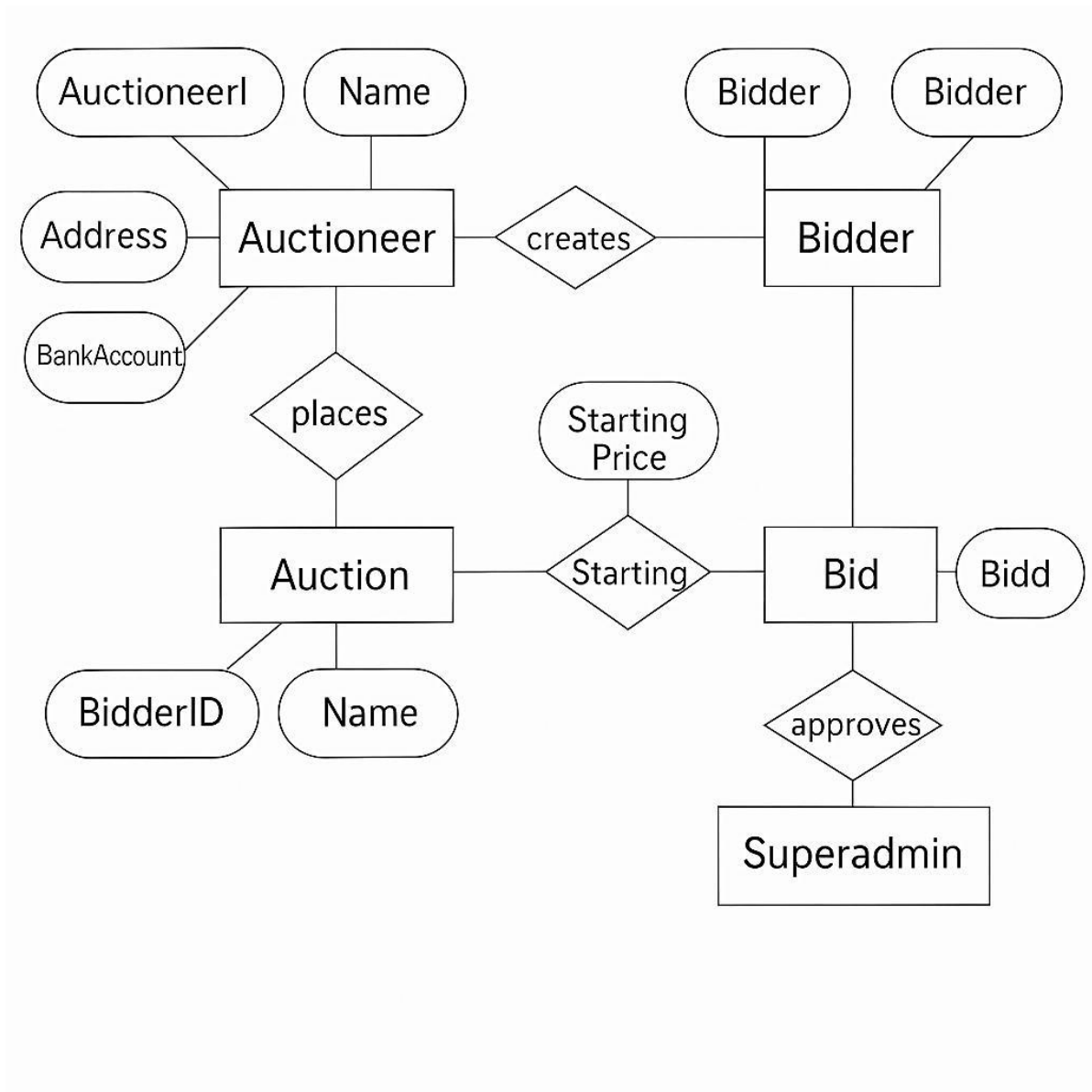
Functional Requirements

- User Registration and Login (Admin, Seller, Bidder)
- Auction listing creation by Seller
- Real-time bidding system
- Countdown timer for auction expiry
- Auto-selection of the highest bidder
- Upload proof of payment by winner
- Admin dashboard for managing auctions and users
- Role-based access control

Non-Functional Requirements

- Responsive and user-friendly UI
- Real-time performance
- Data consistency and integrity
- Security and authentication (JWT)
- Scalability with MongoDB

3.2 ERD



3.3 Table Structure:

1. User

Field	Data Type	Description
UserName	String	User Name
Password	String	Password
Email	String	Email
Address	String	Address
Phone	String	Phone
ProfileImage_public_id	Int	Profile Image public id
profileImage_url	String	Profile Image url
paymentMethods_bankAccountNumber	String	Payment Methods bank Account Number
paymentMethods_bankAccountName	String	Payment Methods bank Account Name
paymentMethods_bankName	String	Payment Methods bank Name
paymentMethods_upi	String	Payment Methods UPI id
Role	String	role
unpaidCommission	Number	Unpaid Commission
auctionsWon	Number	Auctions Won
moneySpent	Number	Money Spent
createdAt	Date	Created At

2. Auction Table

Field	Data Type	Description
Title	String	title
Description	String	description
startingBid	Number	Starting Bid
Category	String	category
currentBid	Number	Current Bid
startTime	String	Start Time
endTime	String	End Time
image_public_id	String	Image public id
image_url	String	Image url
createdBy		Created By
highestBidder		Highest Bidder
commissionCalculated	Boolean	Commission Calculated
createdAt	Date	Created At

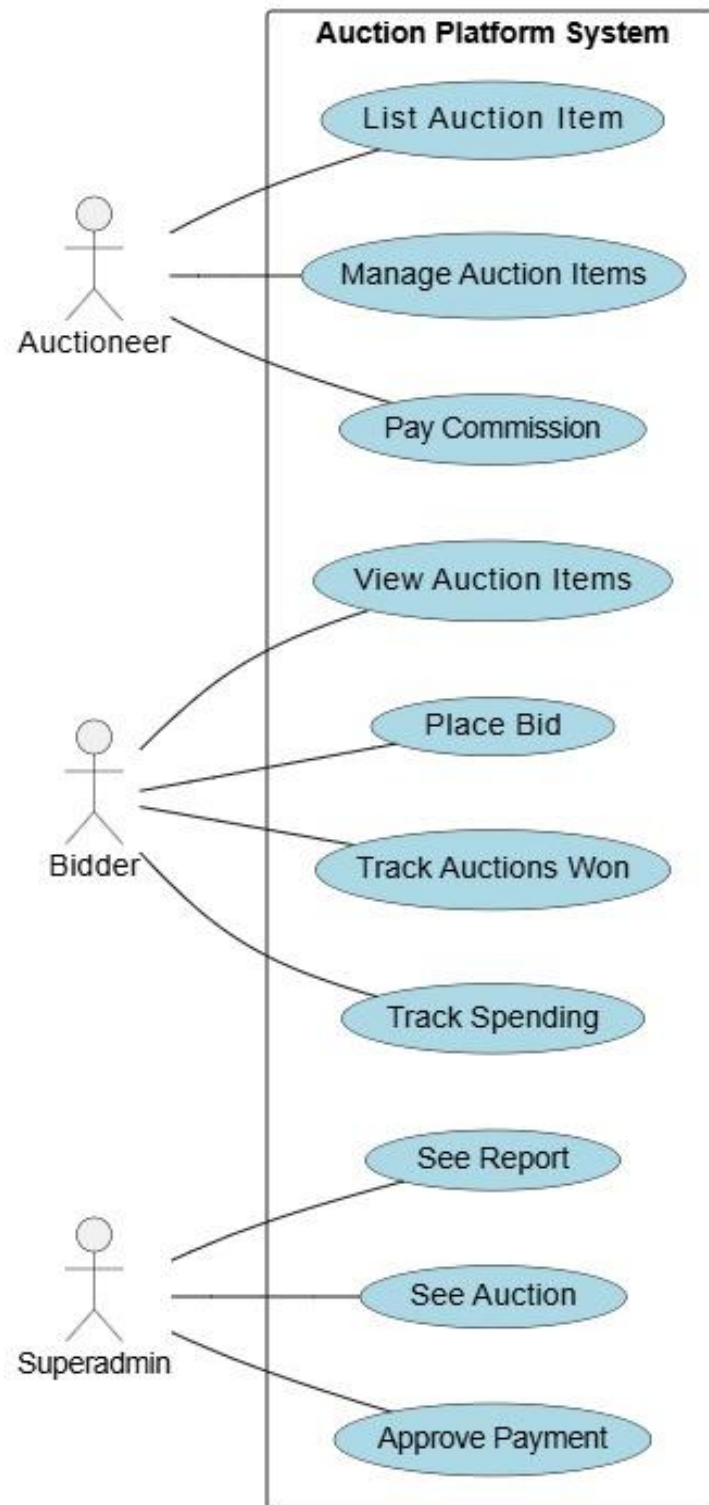
3. Commision Table

Field	Data Type	Description
Amount	Number	amount
User	string	user
createdAt	Date	createdAt

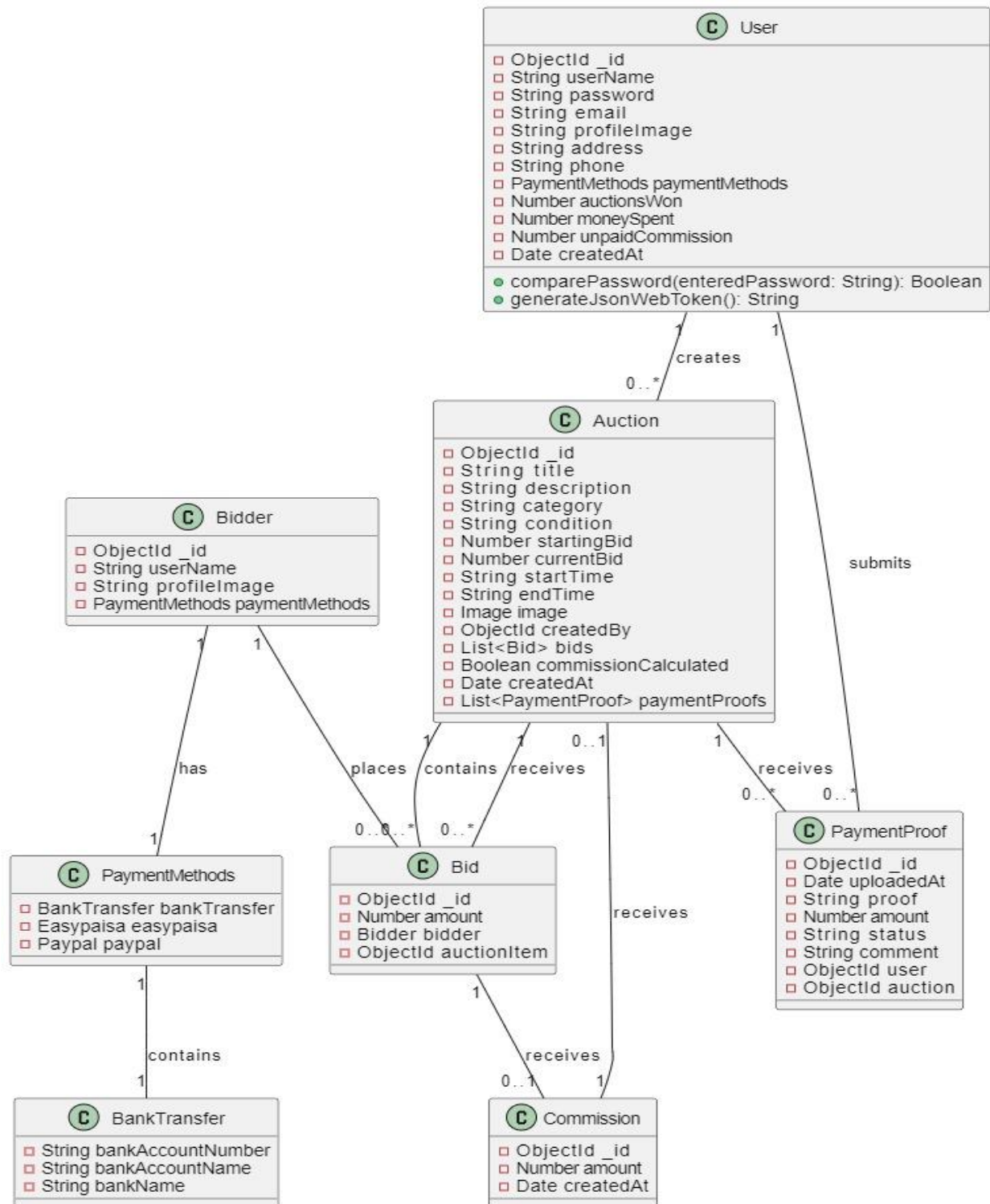
4. Payment Proof

Field	Data Type	Description
user_id	String	User ID
proof_public_id	String	Proof
proof_url	String	url
uploadedAt	Date	Uploaded date
Amount	Number	Amount
Comment	String	comment

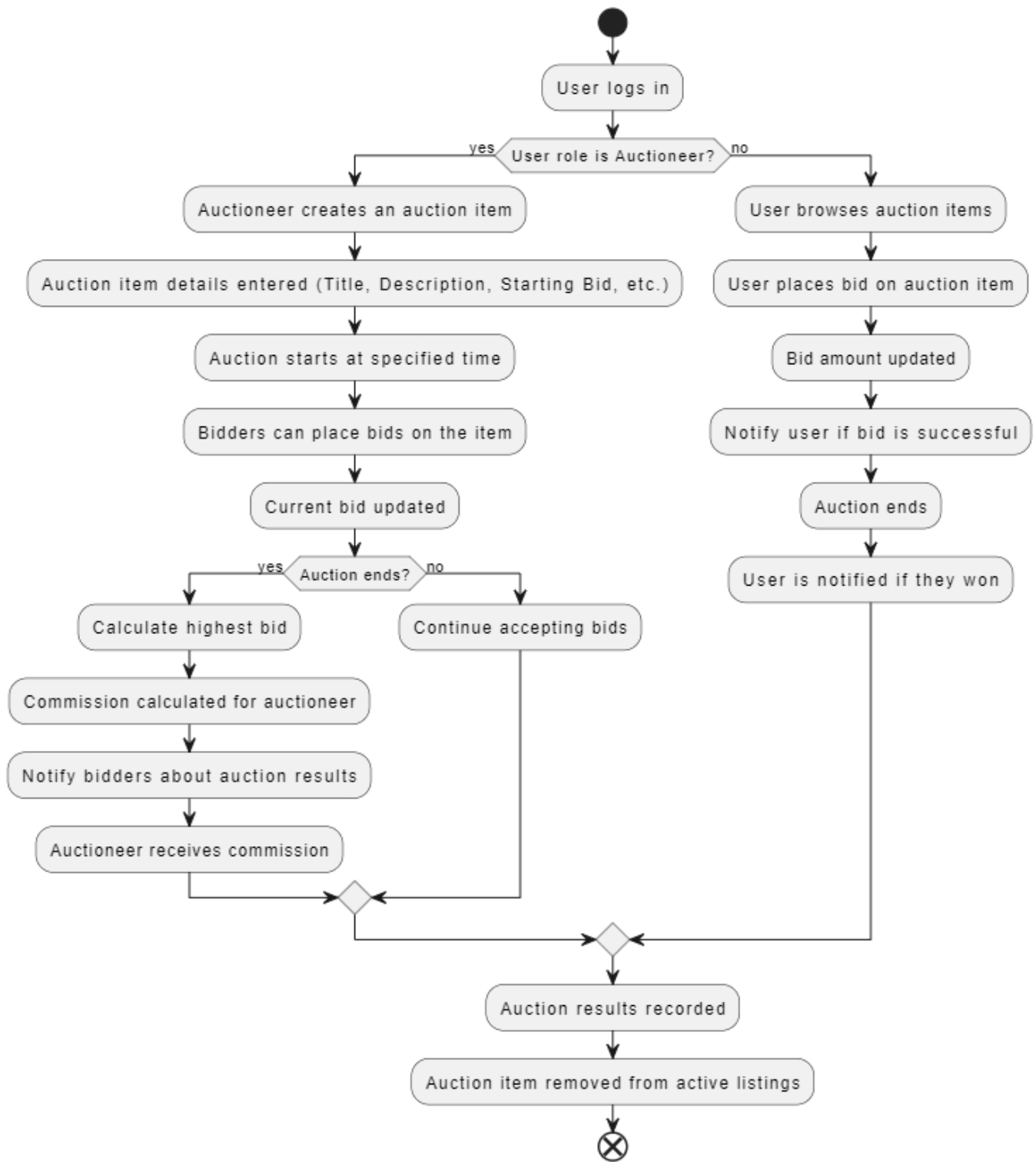
3.4 Use Case Diagram:



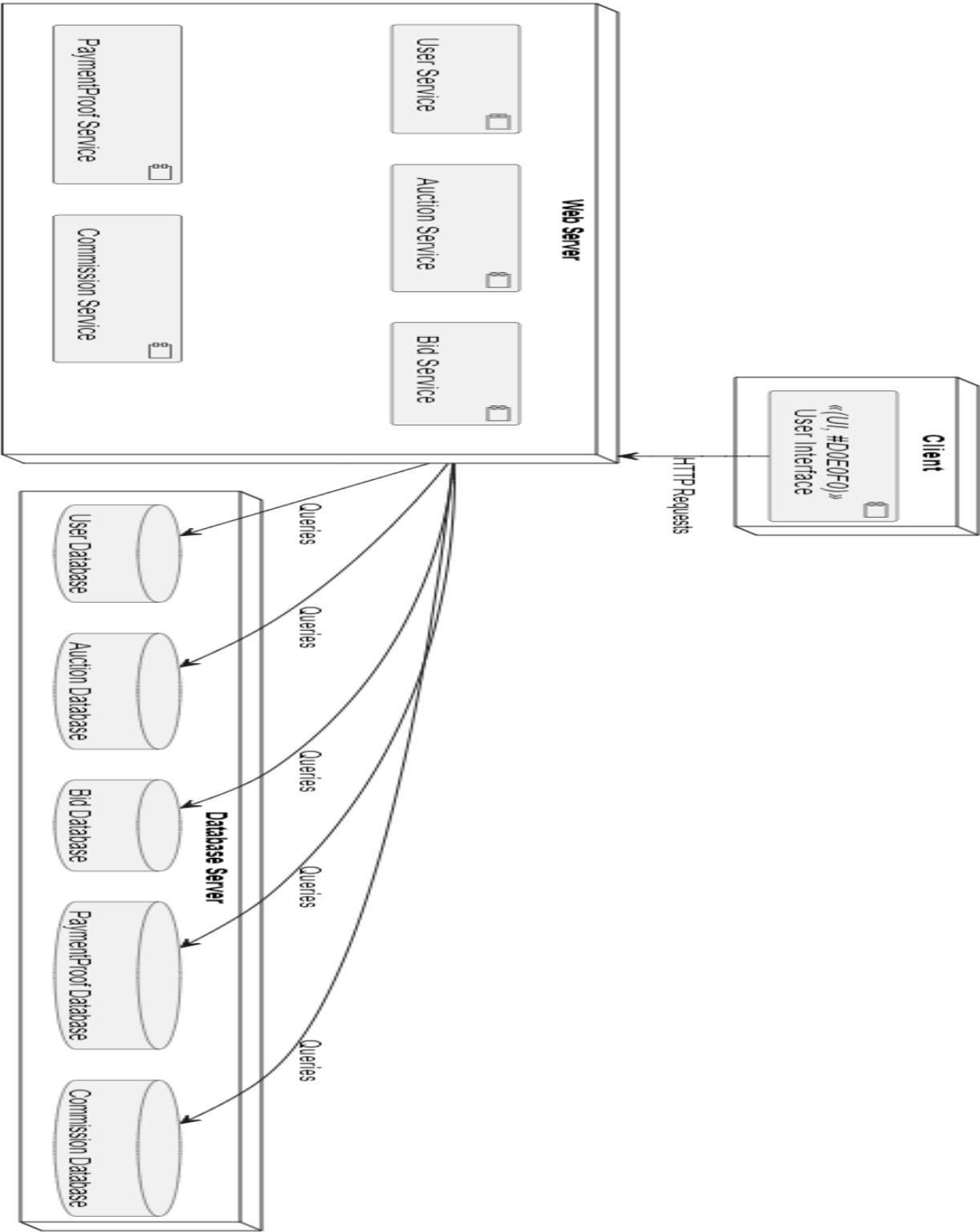
3.5 Class Diagram:



3.6 Activity Diagram:

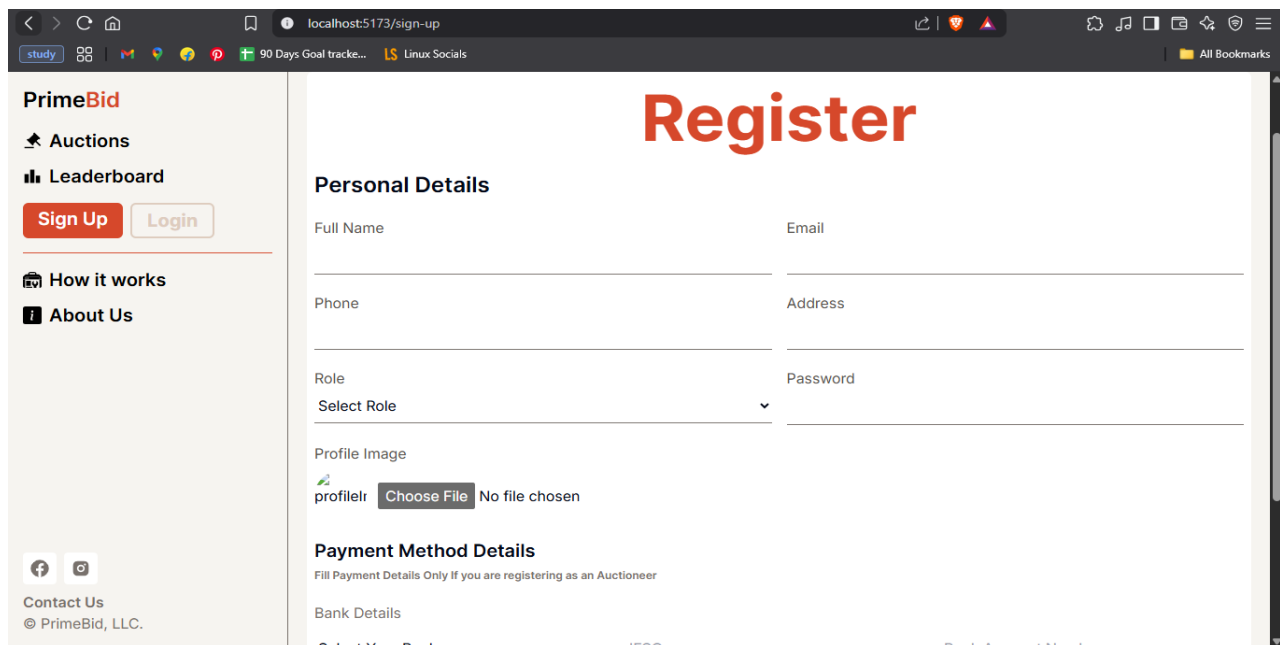


3.7 Deployment Diagram:



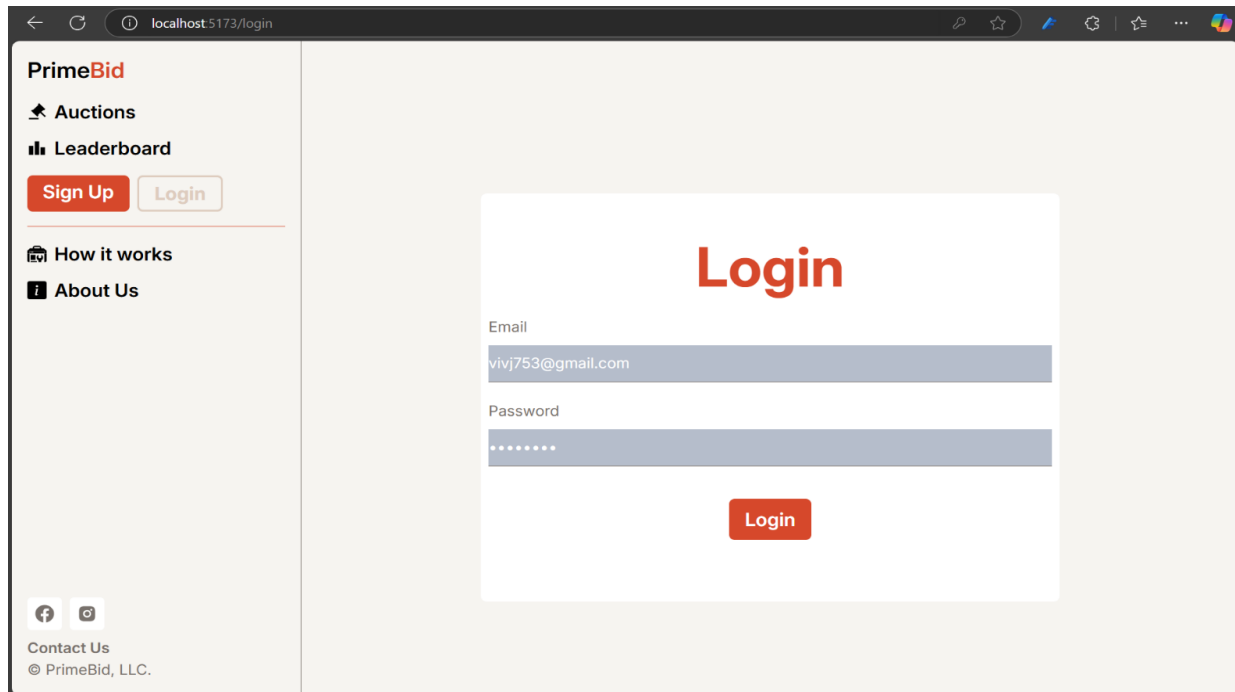
3.9 Input / Output Screens

Register Screen



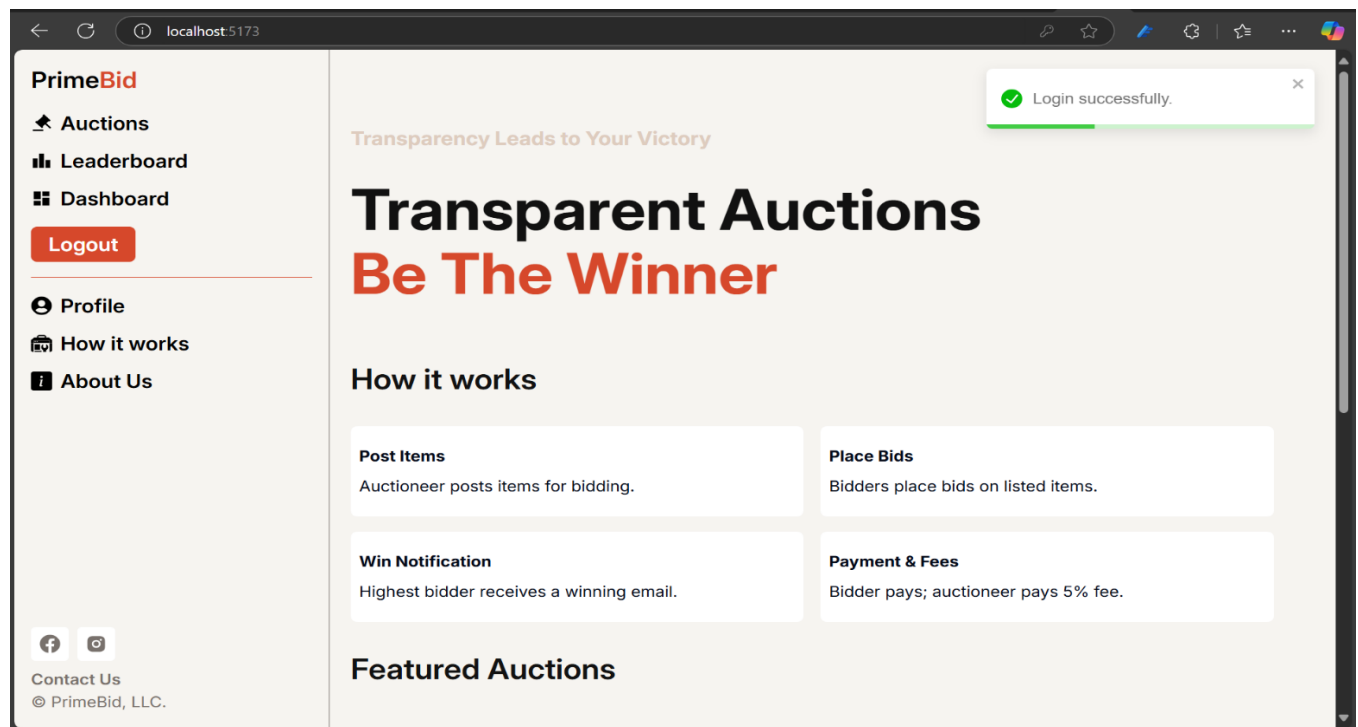
The screenshot shows the PrimeBid Register screen in a web browser. The browser's address bar displays 'localhost:5173/sign-up'. The left sidebar contains the PrimeBid logo, navigation links for Auctions, Leaderboard, Sign Up, and Login, and a footer with social media icons and contact information. The main content area is titled 'Register' in large red text. Below the title, there are two sections: 'Personal Details' and 'Payment Method Details'. The 'Personal Details' section includes input fields for Full Name, Email, Phone, Address, Role (with a dropdown menu), and Password. There is also a 'Profile Image' section with a 'Choose File' button and the text 'No file chosen'. The 'Payment Method Details' section has a heading 'Payment Method Details' and a sub-heading 'Fill Payment Details Only If you are registering as an Auctioneer'. Below this, there is a 'Bank Details' section with a 'Select Your Bank' dropdown and a 'Bank Account Number' input field.

Login Screen:

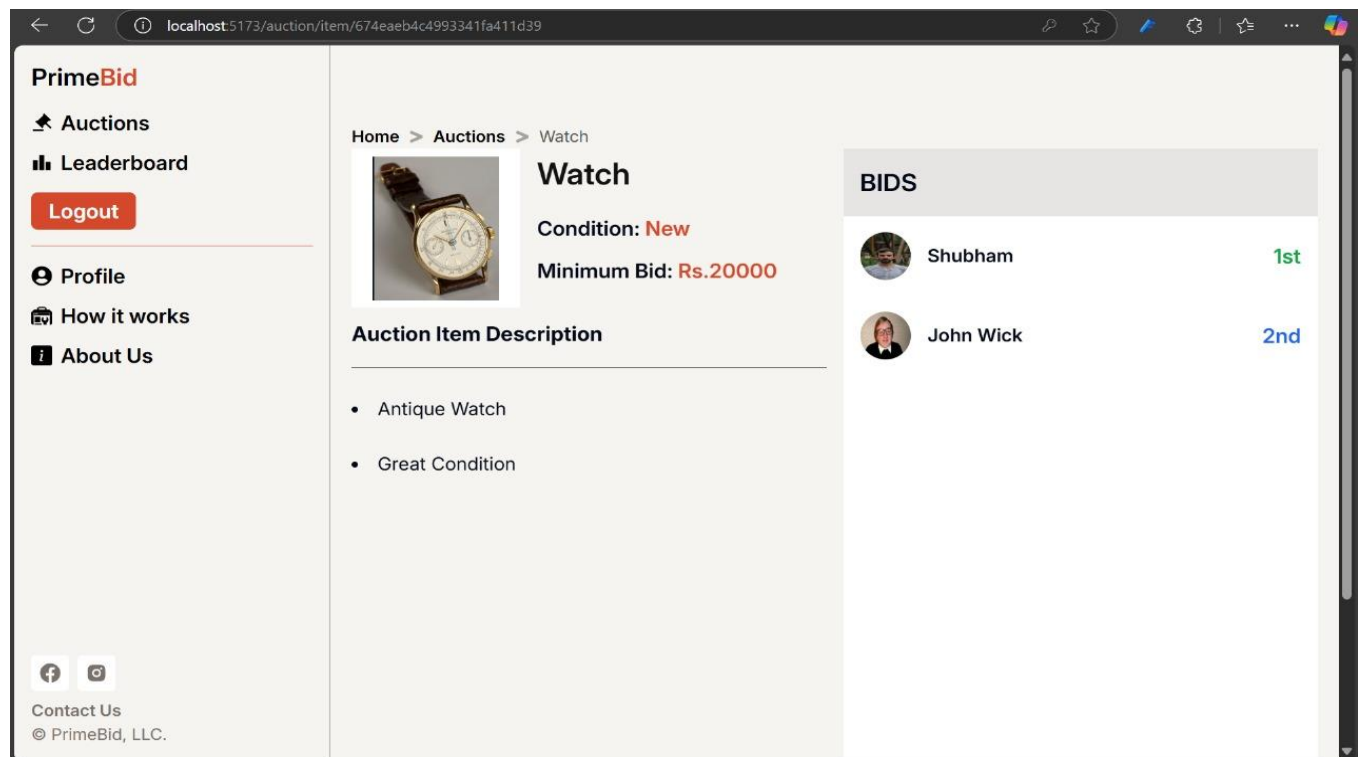


The screenshot shows the PrimeBid Login screen in a web browser. The browser's address bar displays 'localhost:5173/login'. The left sidebar is identical to the Register screen, showing the PrimeBid logo, navigation links, and footer. The main content area has a light beige background. In the center, there is a white box with the title 'Login' in large red text. Below the title, there are two input fields: 'Email' with the value 'vivj753@gmail.com' and 'Password' with masked characters '.....'. A red 'Login' button is positioned below the password field.

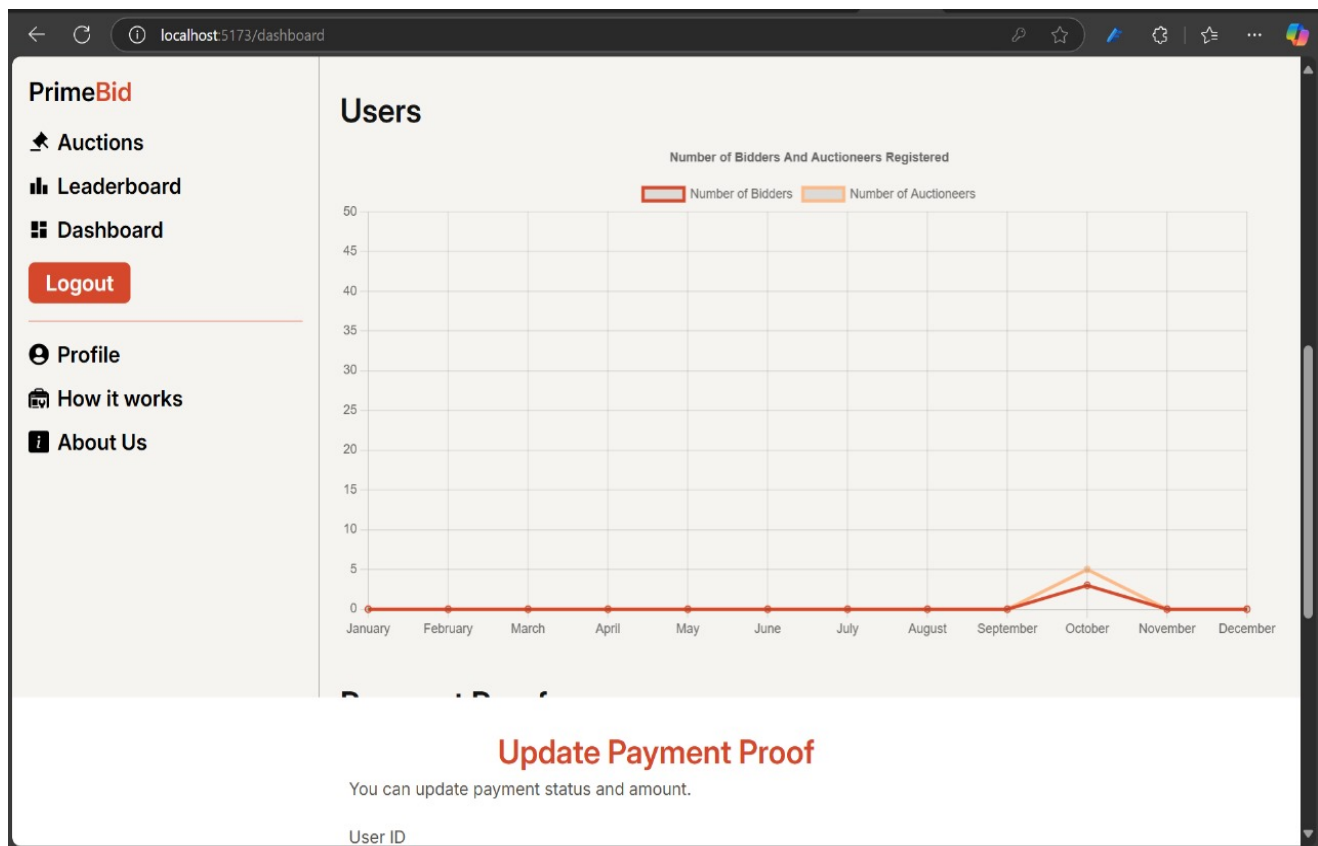
Home Page:



Biding Page:



Admin Page :



4. SAMPLE CODES

4.1 Home.jsx

```
import React from "react";
import { useSelector } from "react-redux";
import { Link } from "react-router-dom";
import FeaturedAuctions from "../home-sub-components/FeaturedAuctions";
import UpcomingAuctions from "../home-sub-components/UpcomingAuctions";
import Leaderboard from "../home-sub-components/Leaderboard";
import Spinner from "@custom-components/Spinner";

const Home = () => {
  const howItWorks = [
    { title: "Post Items", description: "Auctioneer posts items for bidding." },
    { title: "Place Bids", description: "Bidders place bids on listed items." },
    {
      title: "Win Notification",
      description: "Highest bidder receives a winning email.",
    },
    {
      title: "Payment & Fees",
      description: "Bidder pays; auctioneer pays 5% fee.",
    },
  ];

  const { isAuthenticated } = useSelector((state) => state.user);

  return (
    <
      <section className="w-full ml-0 m-0 h-fit px-5 pt-20 lg:pl-[320px] flex flex-col min-h-screen py-4 justify-center">
```



```
<div>
```

```
<p className="text-[#DECCBE] font-bold text-xl mb-8">
```

```
  Transparency Leads to Your Victory
```

```
</p>
```

```
<h1
```

```
  className={`text-[#111] text-2xl font-bold mb-2 min-[480px]:text-4xl md:text-6xl xl:text-7xl 2xl:text-8xl` }
```

```
>
```

```
  Transparent Auctions
```

```
</h1>
```

```
<h1
```

```
  className={`text-[#d6482b] text-2xl font-bold mb-2 min-[480px]:text-4xl md:text-6xl xl:text-7xl 2xl:text-8xl` }
```

```
>
```

```
  Be The Winner
```

```
</h1>
```

```
<div className="flex gap-4 my-8">
```

```
  { !isAuthenticated && (
```

```
    <
```

```
      <Link
```

```
        to="/sign-up"
```

```
        className="bg-[#d6482b] font-semibold hover:bg-[#b8381e] rounded-md px-8 flex items-center py-2 text-white transition-all duration-300"
```

```
      >
```

```
        Sign Up
```

```
      </Link>
```

```
      <Link
```

```
        to={"/login"}
```

```
        className="text-[#DECCBE] bg-transparent border-2 border-[#DECCBE] hover:bg-[#fff3fd] hover:text-[#fdb888] font-bold text-xl rounded-md px-8 flex items-center py-2 transition-all duration-300"
```

```

        >
        Login
    </Link>
</>
)}
</div>
</div>
<div className="flex flex-col gap-6">
    <h3 className="text-[#111] text-xl font-semibold mb-2 min-[480px]:text-xl md:text-2xl lg:text-3xl">How it works</h3>
    <div className="flex flex-col gap-4 md:flex-row md:flex-wrap w-full">
        {howItWorks.map((element) => {
            return (
                <div
                    key={element.title}
                    className="bg-white flex flex-col gap-2 p-2 rounded-md h-[96px] justify-center md:w-[48%] lg:w-[47%] 2xl:w-[24%] hover:shadow-md transition-all duration-300"
                >
                    <h5 className="font-bold">{element.title}</h5>
                    <p>{element.description}</p>
                </div>
            );
        })}
    </div>
</div>
<FeaturedAuctions />
<UpcomingAuctions />
<Leaderboard />
</section>
</>

```

```
);  
};
```

```
export default Home;
```

4.2 ViewMyAuction.jsx

```
import CardTwo from "@custom-components/CardTwo";  
import Spinner from "@custom-components/Spinner";  
import { getMyAuctionItems } from "@store/slices/auctionSlice";  
import React, { useEffect } from "react";  
import { useDispatch, useSelector } from "react-redux";  
import { useNavigate } from "react-router-dom";  
  
const ViewMyAuctions = () => {  
  const { myAuctions, loading } = useSelector((state) => state.auction);  
  const { user, isAuthenticated } = useSelector((state) => state.user);  
  
  const dispatch = useDispatch();  
  const navigateTo = useNavigate();  
  
  useEffect(() => {  
    if (!isAuthenticated || user.role !== "Auctioneer") {  
      navigateTo("/");  
    }  
    dispatch(getMyAuctionItems());  
  }, [dispatch, isAuthenticated]);  
  
  return (  

```

<>

```
<div className="w-full ml-0 m-0 h-fit px-5 pt-20 lg:pl-[320px] flex flex-col">
```

```
<h1
```

```
  className={`text-[#d6482b] text-2xl font-bold mb-2 min-[480px]:text-4xl md:text-6xl xl:text-7xl 2xl:text-8xl` }
```

```
>
```

```
  My Auctions
```

```
</h1>
```

```
{loading ? (
```

```
  <Spinner />
```

```
): (
```

```
  <div
```

```
    className={` ${
```

```
      myAuctions.length > 2 && "flex-grow"
```

```
    } flex flex-wrap gap-6` }
```

```
>
```

```
    {myAuctions.length > 0 ? (
```

```
      myAuctions.map((element) => {
```

```
        return (
```

```
          <CardTwo
```

```
            title={element.title}
```

```
            startingBid={element.startingBid}
```

```
            endTime={element.endTime}
```

```
            startTime={element.startTime}
```

```
            imgSrc={element.image?.url}
```

```
            id={element._id}
```

```
            key={element._id}
```

```
          />
```

```
        );
```

```
      })
```

```
    ): (  
      <h3 className="text-[#666] text-xl font-semibold mb-2 min-[480px]:text-xl md:text-2xl lg:text-  
3xl mt-5">  
        You have not posted any auction.  
      </h3>  
    )}{ " "  
    :  
  </div>  
  })  
</div>  
</>  
);  
};  
  
export default ViewMyAuctions;
```

5. TESTING

5.1 Test Strategy

The PrimeBid Auction Platform's test strategy focuses on ensuring its functionality, security, and stability. Both manual and automated testing approaches were used.

Types of Testing Used:

- Unit Testing: To test individual functions like login, bid placement, etc.
- Integration Testing: Ensures communication between frontend, backend, and database is smooth.
- System Testing: To verify the whole platform works as expected.
- Security Testing: Ensures proper authentication and data protection.

5.2 Unit Test Plan

Test Case	Description	Expected Result	Actual Result	Status
Login Test	Enter valid credentials	User should be redirected to dashboard	Working as expected	Pass
Bid Test	Place a valid bid on an active auction	Bid should be accepted	Working as expected	Pass
Role Check	Try accessing admin route as bidder	Access should be denied	Working as expected	Pass
Auction Timer	Wait till auction end time	Bidding should be disabled	Working as expected	Pass
Upload Proof	Upload image after winning bid	Image should be stored and shown to admin	Working as expected	Pass

5.3 Acceptance Test Plan

This plan was used to verify the system meets all user requirements:

Scenario	Expected Outcome	Status
Admin can manage users and auctions	Admin dashboard loads, actions are successful	Pass
Seller can post a new auction	Auction should be created and visible	Pass
Bidder can join and bid live	Real-time bid updates and win logic works	Pass
System blocks expired auctions	No new bids accepted after end time	Pass
Secure login and logout	JWT-based token authentication works	Pass

5.4 Test cases:

Future enhancements for Auction website could include:

Test Cases for Auction Platform

1. User Authentication

- **Registration:** Valid details → Account created; Invalid details → Error shown.
- **Login:** Correct credentials → Access granted; Incorrect → Error shown.
- **Logout:** User logs out → Redirect to login page.

2. Item Listings

- **Add Item:** Valid details → Item listed; Missing details → Error message.
- **Edit Item:** Modify item details → Changes saved successfully.
- **Delete Item:** Delete an item → Item removed from the listing.

3. Bidding

- **Place Bid:** Higher bid → Accepted; Lower bid → Rejected with error.
- **Auto Increment:** Bidder increases max bid → Updated highest bid.
- **Auction Close:** Bids stop after auction ends → Final winner declared.

4. Notifications

- **Bid Notification:** Notify users when outbid or won.

5. Security

- **SQL Injection:** Malicious input → Input sanitized, no database issues.
- **Unauthorized Access:** Access pages without login → Redirect to login.

6. Reports

- **Activity History:** User views their bids and winnings → Correct data shown.
- **Auction Summary:** Admin views auction stats → Data displayed accurately.

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Result	Actual Result	Status
TC-01	User Registration - Valid Input	1. Navigate to registration page. 2. Enter valid details. 3. Click "Register".	Username: user1 Email: user1@example.com Password: P@ssword1	Account created successfully, and confirmation displayed.	Account created successfully.	Pass
TC-02	User Registration - Invalid Email	1. Navigate to registration page. 2. Enter invalid email. 3. Click "Register".	Username: user2 Email: invalidEmail Password: P@ss1	Error message "Invalid email format" displayed.	Invalid email format displayed.	Pass
TC-03	Add Item - Valid Input	1. Log in. 2. Navigate to "Add Item". 3. Enter valid details and submit.	Name: Phone Price: \$100 Description: New phone	Item successfully added and visible in auction listing.	Item successfully added and visible in auction listing.	Pass

TC-04	Add Item - Missing Fields	1. Log in. 2. Navigate to "Add Item". 3. Submit with missing name field.	Price: \$100 Description: New phone	Error message "Name is required" displayed.	Name is required displayed.	Pass
TC-05	Place Bid - Higher Bid	1. Log in. 2. Select an auction item. 3. Enter a higher bid and submit.	Current Bid: \$100 User Bid: \$120	Bid accepted, user becomes the highest bidder.	Bid accepted	Pass
TC-06	Place Bid - Lower Bid	1. Log in. 2. Select an auction item. 3. Enter a lower bid and submit.	Current Bid: \$100 User Bid: \$90	Error message "Bid must be higher than current bid" displayed.	Bid must be higher than current bid displayed.	Pass
TC-07	Notifications - Auction Won	1. Auction ends with user3 as highest bidder.	Highest Bidder: user3	User3 receives notification: "You won the auction!"	Get the notification- You won the auction	Pass

5.5 Defect Report

This defect report summarizes any issues encountered during the testing phase of the Auction Platform.

Defect ID	Test Case ID	Module	Description	Severity	Status
–	TC-01 to TC-07	Multiple	No defects encountered in current test cases.	–	Pass

6. LIMITATIONS OF THE PROPOSED SYSTEM

Technical Problems:

Website downtime, slow page loads, and bugs can disrupt auctions, especially during high-stakes moments, damaging the user experience and trust.

Limited User Accessibility:

Users in different time zones or those with slow internet connections may have difficulty engaging in real-time auctions, which could limit the potential audience.

Security Concerns:

Auction websites can be vulnerable to hacking and fraud, especially in financial transactions and personal information storage.

Protection of payment details and user privacy is essential but can be costly and complex.

7. PROPOSED ENHANCEMENT

- **AI and Machine Learning:** Implement AI for personalized recommendations, fraud detection, and bidding predictions.
- **Blockchain Technology:** Use blockchain for transparent, secure, and tamper-proof transaction records.
- **Augmented Reality (AR):** Enable users to visualize products in 3D for a better understanding of item quality.
- **Improved Mobile Experience:** Optimize apps for faster navigation, notifications, and a user-friendly interface.
- **Global Expansion:** Introduce multilingual support, regional payment gateways, and international shipping options.

8. CONCLUSION

The **PrimeBid – Online Auction Platform** successfully demonstrates the integration of modern web technologies to deliver a seamless and real-time bidding experience. This project showcases effective use of the **MERN stack (MongoDB, Express.js, React.js, Node.js)** along with **Socket.IO** for real-time bid updates and **role-based access control** for enhanced security and usability.

From designing a clean and responsive frontend to building a robust backend API and implementing live auction functionalities, this project provided a comprehensive full-stack development experience. The clear separation of user roles (Admin, Seller, Bidder) ensures secure and intuitive interactions, while features like winner declaration and auction management add real-world practicality.

Overall, PrimeBid is a scalable and production-ready application that reflects both technical proficiency and a strong understanding of user experience. This project has not only strengthened my backend and frontend development skills but also deepened my understanding of real-time web applications and full-stack architecture.

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