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DEPARTMENT OF INFORMATION TECHNOLOGY

IT431 Web Application Development Lab
Micro Project
Online Auction



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Introduction

An online auction (or electronic auction, or e-auction) is an auction which is held over the internet. Like auctions in general, online auctions come in a variety of types like ascending English auctions, descending Dutch auctions, First-Price Sealed-Bid, Vickrey auctions and others, which are sometimes not mutually exclusive.

The scope and reach of these auctions have been propelled by the Internet to a level beyond what the initial purveyors had anticipated. This is mainly because online auctions break down and remove the physical limitations of traditional auctions such as geography, presence, time, space, and a small target audience. This influx in reachability has also made it easier to commit unlawful actions within an auction. In 2002, online auctions were projected to account for 30% of all online e-commerce due to the rapid expansion of the popularity of the form of electronic commerce. Online auctions include business to business (B2B), business to consumer (B2C), and consumer to consumer (C2C) auctions.

There are different bidding techniques involved like Auction Squatting, Auction Sniping and Beginning with a high bid. Auction Squatting involves placing early bids and then watching the auction until the very end. The main tactic is to look for other bids in order to be able to match them as fast as possible. Auction Sniping involves waiting up until the last few seconds of an online auction and then submitting your bid with the goal of "stealing" the auction from everyone else. In some cases, Beginning with a high bid is the best strategy, instead of starting off with low bids.

The largest online auction site is eBay, which was the first to support person-to-person transactions. Other popular examples of online auction sites include WebStore, OnlineAuction and Overstock. Bidding on eBay auction-style listings is called proxy bidding and is essentially equivalent to a Vickrey auction (sealed-bid), with some exceptions. eBay implemented a system of seller ratings with four categories, and even allows sellers to donate a portion of their auction proceeds to a charity of the seller's choice.

About the Project

Approach to the Problem

The Online Auction developed here was based on a combination of the features of the Auction types: English Auctions and First-Price Sealed-Bid Auctions. This online auction is similar to an English Auction in the way that it is an open, ascending dynamic auction in which the identities of all bidders are known. Exceptions to this are, the identities are known only until the end of the auction and none of the bidders will know what is the bid of each opponent, like First-Price Sealed-Bid auctions. There are no starting bids or predetermined minimum increments, which is unlike common English Auctions. However, the winner of the auction is the highest bidder and the price is the highest bid, or the winning bidder's final bid like in English Auctions.

Module-wise explanation

Seller Login page and Login Authentication servlet

This checks if the seller is a registered seller in the database and grants permission accordingly. If the seller does not exist in the table, an error message is displayed.

Seller Central servlets and CheckTable servlet

These servlets enable the seller to add, or register items to the database for listing, and delete items by accepting their corresponding item numbers. The CheckTable servlet provides the seller, the feature of checking the live status of ongoing auctions in a separate tab. The seller central servlet also contains a button for redirection to the Home page.

User Login page and Login Authentication servlet

This checks if the user is registered in the database and grants permission accordingly. If the user does not exist in the table, an error message is displayed.

User Sign-Up page and Registration servlet

These enable a new user to register the user's details to the database.

Auction Bidding servlets

These display the items and their details in the main bidding page, depending on the item numbers of the items entered by the seller beforehand. They also accept bids dynamically and redirect control to the UpdateBid servlet. They also include a JSP file for a countdown timer and a CheckStatus servlet which shows all users, live updates of the ongoing auction with the identity of the highest bidder, in a separate tab.

Timer.jsp file

It provides a live countdown timer that works by calculating the difference between the current time and a preset date and time, every second, in a loop. Once the difference reaches zero, it automatically redirects all users to the Results servlet, after displaying an 'Auction Ended' message.

UpdateBid servlet

This checks if each bid entered by a user is greater than, lesser than, or equal to the current price of the item entered in the Auction_Items table. If the newly entered bid is greater than the previous bid in the table, then the price is updated. Otherwise, a message is displayed showing the bid is not high enough.

Results servlets

These display the results of the auction to all users. It shows the final bid placed by the winner and a 'Proceed to Checkout' button, for the winner alone. For the other participants, a 'You have been outbid' message is displayed.

Admin Login page and Login Authentication servlet

This checks if the admin is registered in the database and grants permission accordingly. If the admin does not exist in the table, an error message is displayed.

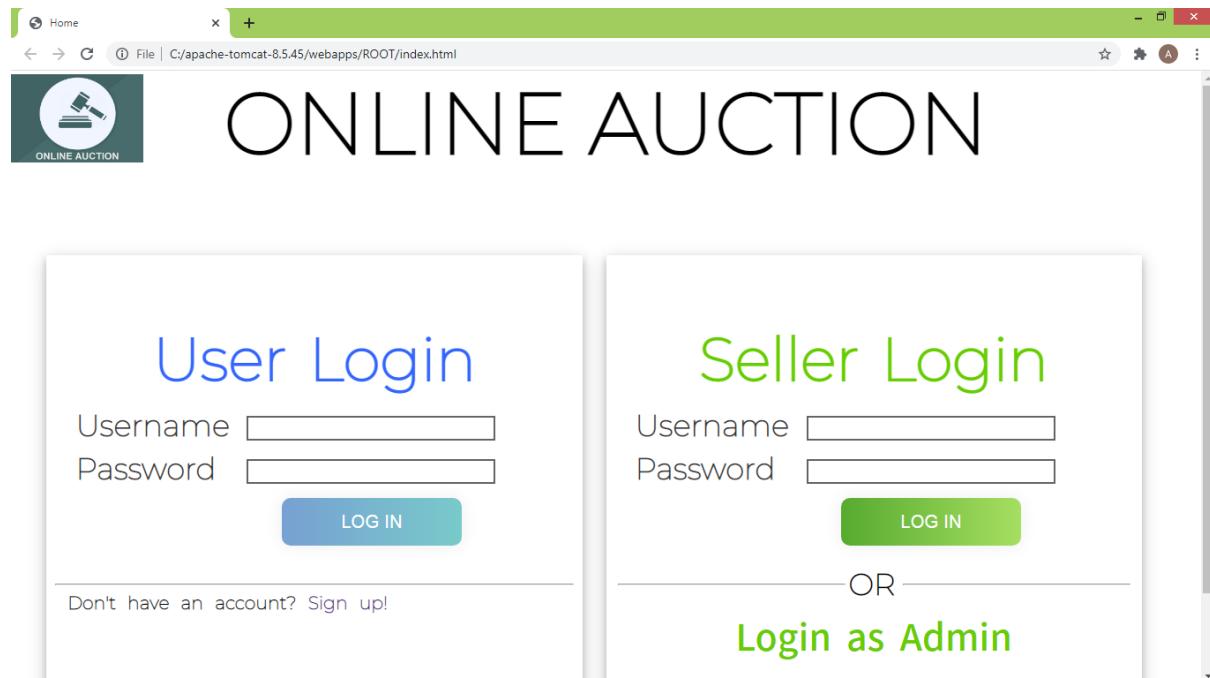
Admin Central servlets

These servlets are responsible for redirection to ReportGeneration servlets and for performing Deletion of unwanted or fake users.

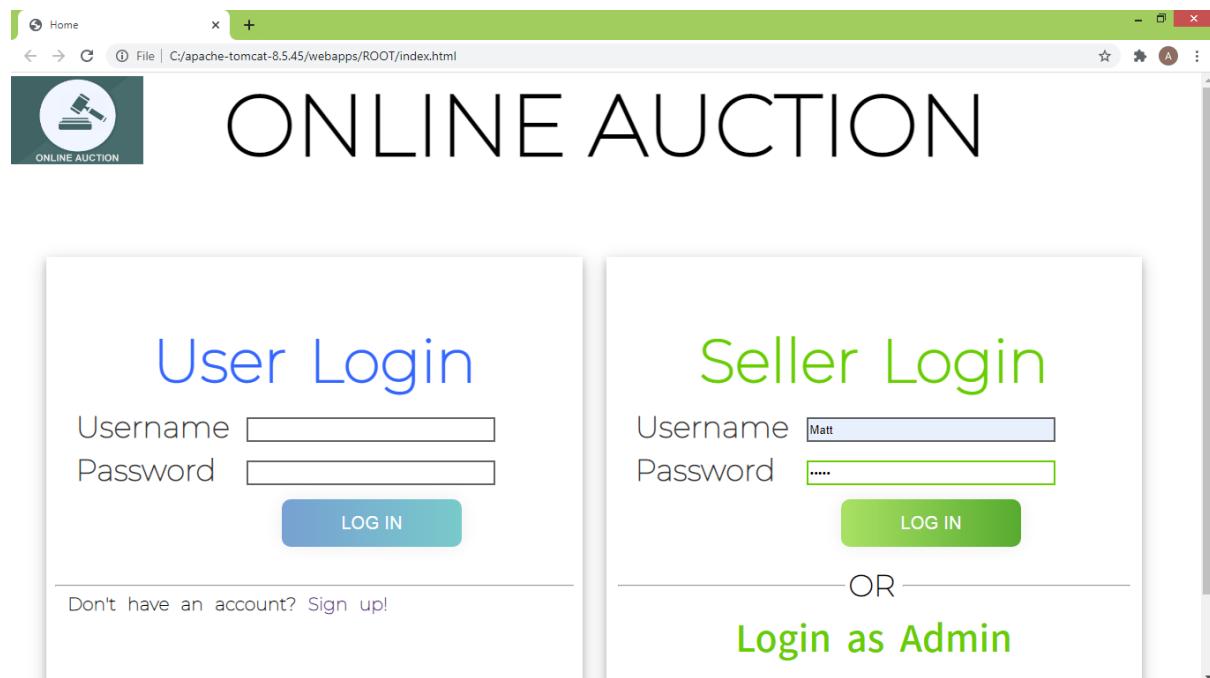
Report Generation servlets

These servlets display the updated status of the Registered Users' table and the Auction Items' table at the time of request generation, in a separate tab.

Screenshots



Auction Home Page



Entering Seller details

Seller Central

ONLINE AUCTION

Add Items for Auction

Enter the item details below :

Unique Item No:

Item Name:

Remove Items for Auction

Enter the item number below :

Item Number:

Seller Page

Seller Central

Auction Items

ONLINE AUCTION

Listed Auction Items

Item_no	Item_name
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Initial Table status, retrieved live from Database every 3 seconds, for the Seller.

Seller Central Auction Items localhost:8080/SellerLogin



Seller Central

Add Items for Auction

Enter the item details below :

Unique Item No:

Item Name:

Remove Items for Auction

Enter the item number below :

Item Number:

Adding an item to the table.

Seller Central Auction Items localhost:8080/SellerCentral2



Seller Central

Add Items for Auction

Enter the item details below :

Unique Item No:

Item Name:

Remove Items for Auction

Enter the item number below :

Item Number:

Adding another item to table.

Seller Central

Auction Items

localhost:8080/CheckTable

ONLINE AUCTION

Listed Auction Items

Item_no	Item_name
101	Tennis Ball
102	Toy Car

Seller can see the change, live.

Seller Central

Auction Items

localhost:8080/SellerCentral2

ONLINE AUCTION

Seller Central

Add Items for Auction

Enter the item details below :

Unique Item No:

Item Name:

Remove Items for Auction

Enter the item number below :

Item Number:

Removing items by item number.

Seller Central

Auction Items

localhost:8080/CheckTable

ONLINE AUCTION

Listed Auction Items

Item_no	Item_name
101	Tennis Ball

The seller can see the deletion result, live.

Home

localhost:8080/index.html

ONLINE AUCTION

User Login

Username

Password

LOG IN

Don't have an account? [Sign up!](#)

Seller Login

Username

Password

LOG IN

OR

Login as Admin

Logging in as a registered user, John.

Register + file:///C:/apache-tomcat-8.5.45/webapps/ROOT/register.html



ONLINE AUCTION

Sign Up

Username

Password

SIGN UP

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

Simultaneously registering as a new user, Jacob.

Auction Bidding + localhost:8080/UserLogin



Auction Bidding

Item Name: Tennis Ball



Item Number: 101
Description: Highly Durable and Non-Pressurized
Condition: Excellent

Submit Bid

Auction ends in :

0d 0h 1m 32s

Item Name: Toy Car



Item Number: 102
Description: 1:32 Scale Model of Bugatti Chiron
Condition: Used

Submit Bid

**Auction Home Page as visible for John.
John places an initial bid of 100 on Tennis Ball.**

The screenshot shows a web browser window titled "Auction Bidding" at the URL "localhost:8080/AuctionBidding". The page features a header with a logo of a gavel inside a circle and the text "ONLINE AUCTION". Below the header, there are two sections for bidding items:

- Item Name: Tennis Ball**
Item Number: 101
Description: Highly Durable and Non-Pressurized
Condition: Excellent
Buttons: "Place New Bid Here" and "Submit Bid".
A "Bid Status" box on the right says "Auction ends in : 0d 0h 1m 29s".
- Item Name: Toy Car**
Item Number: 102
Description: 1:32 Scale Model of Bugatti Chiron
Condition: Used
Buttons: "Place New Bid Here" and "Submit Bid".

A message at the bottom states: "You are currently the highest bidder for the Item : Tennis Ball." A "Check Bid Status" button is also present.

Result after placing initial bid.

The screenshot shows a web browser window titled "Auction Bidding" at the URL "localhost:8080/CheckStatus". The page features a header with a logo of a gavel inside a circle and the text "ONLINE AUCTION". Below the header, there is a section titled "Check Bid Status" with a table showing the current auction status:

Item_no	Item_name	User Name
101	Tennis Ball	John
102	Toy Car	

Clicking on the 'Check Bid Status' button shows the current Auction status on a new tab. It shows the name of the current highest bidder for each listed item.

Auction Bidding

ONLINE AUCTION

Item Name: Tennis Ball

Item Number: 101
Description: Highly Durable and Non-Pressurized
Condition: Excellent

Place New Bid Here Submit Bid

Item Name: Toy Car

Item Number: 102
Description: 1:32 Scale Model of Bugatti Chiron
Condition: Used

150 Submit Bid

Jacob places a bid for the second item.

Auction Bidding

Bid Status

ONLINE AUCTION

Check Bid Status

Item_no	Item_name	User Name
101	Tennis Ball	John
102	Toy Car	Jacob

The table gets updated live, with Jacob's name.

Auction Bidding

Auction ends in :
0d 0h 0m 50s

Item Name: Tennis Ball

Item Number: 101
Description: Highly Durable and Non-Pressurized
Condition: Excellent

50

Item Name: Toy Car

Item Number: 102
Description: 1:32 Scale Model of Bugatti Chiron
Condition: Used

Place New Bid Here

You are currently the highest bidder for the Item : Toy Car.

Jacob places a bid lower than John's for Tennis Ball.

Auction Bidding

Auction ends in :
0d 0h 0m 46s

Item Name: Tennis Ball

Item Number: 101
Description: Highly Durable and Non-Pressurized
Condition: Excellent

Place New Bid Here

Item Name: Toy Car

Item Number: 102
Description: 1:32 Scale Model of Bugatti Chiron
Condition: Used

Place New Bid Here

Your current bid for Tennis Ball is not high enough.

It shows Jacob's bid is not high enough.

Auction Bidding Bid Status

localhost:8080/AuctionBidding

ONLINE AUCTION

Auction Bidding

Auction ends in :
-1d -1h -1m -1s

**Item Name: Tennis Ball**

Item Number: 101
Description: Highly Durable and Non-Pressurized
Condition: Excellent

Auction Ended

**Item Name: Toy Car**

Item Number: 102
Description: 1:32 Scale Model of Bugatti Chiron
Condition: Used

You are currently the highest bidder for the Item : Tennis Ball.

When the countdown timer runs out, this message is showny.

Auction Results Bid Status

localhost:8080/Results

ONLINE AUCTION

Auction Results

Congratulations! You have won the auction for the item : Tennis Ball.

Your Final Bid was : 100

You have been outbid by another buyer for the item : Toy Car.

Thank you for your participation in this auction.

**All users are then taken to the results page simultaneously.
This is the results page for John.**

The screenshot shows a web browser window with two tabs: "Auction Results" and "Bid Status". The "Auction Results" tab is active, displaying the URL "localhost:8080/Results". The page content includes a logo for "ONLINE AUCTION" with a gavel icon. A section titled "Auction Results" displays the message: "You have been outbid by another buyer for the item : Tennis Ball." Below it, another message says: "Thank you for your participation in this auction." Further down, another section says: "Congratulations! You have won the auction for the item : Toy Car." and "Your Final Bid was : 150". A "Proceed to checkout" button is visible.

This is the results page for Jacob.

The screenshot shows a web browser window with the URL "localhost:8080/index.html". It displays two login forms side-by-side. The left form is titled "User Login" and contains fields for "Username" and "Password", with a "LOG IN" button. Below it is a link "Don't have an account? Sign up!". The right form is titled "Seller Login" and also contains fields for "Username" and "Password", with a "LOG IN" button. Below these is a horizontal line with the word "OR" above it, followed by a link "Login as Admin".

Logging in as Admin

The screenshot shows a web browser window titled "Admin Login" with the URL "localhost:8080/admin.html". The page features a logo with a gavel icon and the text "ONLINE AUCTION". A large "ONLINE AUCTION" header is visible. The main content is a "Admin Login" form with fields for "Username" (containing "Ryan") and "Password" (containing "....."). A blue "LOG IN" button is at the bottom.

Admin Login Page

The screenshot shows a web browser window titled "Admin Central" with the URL "localhost:8080/AdminLogin". The page features a logo with a gavel icon and the text "ONLINE AUCTION". The main title is "Admin Central". Below it, there is a message: "To generate a report of all registered users and listed items, click below :". A "Generate Report" button is present. A modal window titled "Deleting Unwanted Users" contains the instruction "Enter the Username below :" and a "Username:" input field. A "Delete User" button is located at the bottom of the modal.

Admin clicks on Generate Report to see the latest Auction status.

Report

Listed Auction Items

Item Number	Item Name	Username	Final Bid
101	Tennis Ball	John	100
102	Toy Car	Jacob	150

Registered Users

Username
John
Jacob

A report of the latest, or final Auction status is shown, along with the names of all registered users.

Admin Central

To generate a report of all registered users and listed items, click below :

Deleting Unwanted Users

Enter the Username below :

Username:

Admin enters a user's name to delete the user.

Report

Listed Auction Items

Item Number	Item Name	Username	Final Bid
101	Tennis Ball	John	100
102	Toy Car	Jacob	150

Registered Users

Username
John

The user Jacob has been deleted, as visible from the next generated report.

Summary of Work Done

Additional Modules/Features added

In the seller side of the program, some additional features added were allowing the seller to remove items from auction, and checking the live status of the ongoing auction.

In the user side, a global countdown timer was implemented that allowed synchronisation among multiple users and automatic redirection to display the results when the timer stopped. It also displays a message saying 'Auction has ended' when the timer stops. All users have the option to check the live status of the auction and see the current highest bidder for each listed item. The program also allows registration of new users to join the auction. No new additions were made to the admin side of the program.

Conclusions

Online auctions have effectively created a giant virtual marketplace where people can gather to buy, sell, trade and check out the goods of the day. This field has had a tremendous growth in the recent years. They're enormously popular, high-traffic venues where a user can either begin selling products or purchasing them, almost immediately, with very few restrictions. With the advent of online auctioning, the process of selling and buying has become lot more effortless for potential buyers.

An Online Auction system based on the features of the traditional English Auction system and the First-Price Sealed-Bid Auction was implemented on a small scale. The system developed is a user-friendly auctioning site where any kind of product can be auctioned and it provides services to the bidders, sellers and an administrator.

The process of designing and developing an Online Auction system in a small scale helped in attaining a better understanding about the implementation, working and complexity of real-time, practical web applications.

Alternatively, the option of allowing the seller to enter the auction's ending time dynamically would have proved to be much more efficient than entering it manually in the program code.

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