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COMP1216. Software Modelling and Design (2022-23)

Group 17: Banana Online Auction System

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1 Introduction

The auction system is capable of managing multiple auctions at the same time. Users can register and can assume the roles of bidders or sellers. Sellers can list an item by giving the item name, auction duration and reserve price. Bidders are able to place bids on these items. If a bidder places a bid that exceeds the reserve price, the seller is no longer able to cancel the bid without acquiring a penalty point. However, if the highest bid does not exceed the reserve price by the time the auction duration ends, the auction closes and it fails. Alternatively, if a seller wants to cancel before the reserve price is met, they may do so without repercussions. The seller cannot bid for their own item. Bidders must place a higher bid than the previous one. If the bid is successful, the highest bidder is notified upon closure of the auction. For a defined period after auction closure/cancellation, the bidders may give feedback on the seller. The status of the auction should be transparent to the seller at any given moment.

Dwijesh was selected to create the introduction to the project which covers the assignment of roles and tasks as well as to generate a state diagram that depicts the lifecycle of an "Auction" object, from creating to close. Alejandro was nominated as project manager. He was designated with the responsibility of producing the scope of the system, including needs, goals, business case, stakeholders, high-level operational concepts, etc. Panayiotis was tasked with producing three full scenarios: one successful scenario, one failed scenario and one cancelled auction. He was also chosen to create the use case descriptions which are refinements of the scenarios developed previously. Nayden's tasks following this were to implement the use case descriptions into UML use case diagrams as well as developing an activity diagram. Patrick was assigned to create a UML class diagram which includes all possible classes involved with the auction system. In addition to this, Patrick was also delegated the task of designing two unique UML sequence diagrams based on the use case descriptions produced by Panayiotis.

2 Scope

Needs

-Create an auction system that allows the easy submission of items and the ability to bid for said items.
-Users need a simple platform to buy/sell items.
-Implements a penalty system to let bidders know if a seller is reliable, to prevent malicious use of system.

Goals

-Allows registering of users, which can take both seller and bidder roles.
-Implements a penalty system.
-Sellers can start an auction.
-Bidders can bid in auctions.
-Can support multiple auctions simultaneously.

Business Case

-Makes it easy for users to sell/buy items online.
-Company can make money from advertisements and for charging small fees to the users.

Stakeholders

-Users (Sellers and Bidders).
-Business (Banana Company).

High-level Operational Concepts

-Users can register an account and log into it.
-Users can change their roles from bidders to sellers and vice-versa.
-Sellers who meet the requirements can put an item for auction.
-Bidders can bid on an auction during the time it is open.
-When the timer finishes, the auction finishes.
-If the auction finishes and the highest bid is as much as the reserve price, the auction is successful and the highest bidder is notified.
-If the auction finishes and the highest bid is less than the reserve price, the auction fails.
-If the seller chooses the cancel the auction before there is a bid greater than or equal to the reserve price, the seller will not be awarded any penalty.
-If the seller chooses to cancel the auction after there exists a bid greater than or equal to the reserve price, the seller will receive a penalty.
-When an auction is cancelled, all bidders are notified.
-Bidders can submit feedback on the auction.

Success Criteria

-10,000 active users by 2025
-£5M in revenue by 2025
-3,000 sales by 2025

3 Scenarios

3.1 Scenario 1. Success Scenario

Actors: Seller, Bidder

1. Banana seller logs on to banana.co website
2. Banana seller clicks on setup auction
3. Seller enters a valid start and end time
4. Seller enters a description of the banana and its reserve price
5. Auction is started
6. Bidder is allowed to bid on the banana
7. Auction end time is reached
8. Auction is closed
9. Bidder's bid surpasses reserve price
10. Auction ends bidder is notified
11. Feedback window opens for bidder to provide feedback on seller

3.2 Scenario 2. Fail Case

Actors: Seller, Bidder

1. Banana seller logs on to banana.co website
2. Banana seller clicks on setup auction
3. Seller enters a valid start and end time
4. Seller enters a description of the banana and its reserve price
5. Auction is started
6. Bidder is allowed to bid on the banana
7. Auction end time is reached
8. Auction is closed
9. Bidder's bid does not surpass reserve price
10. Auction fails
11. Feedback window opens for bidder to provide feedback on seller

3.3 Scenario 3. Cancellation Case

Actors: Seller, Bidder

1. Banana seller logs on to banana.co website
2. Banana seller clicks on setup auction
3. Seller enters a valid start and end time
4. Seller enters a description of the banana and its reserve price
5. Auction is started
6. Bidder is allowed to bid on the banana

   if seller cancels auction before reserve price is reached **then**
7. Auction is canceled, all bidders are notified
8. Feedback window opens for bidder to provide feedback on seller

   if seller cancels auction after reserve price has been reached **then**
9. Seller receives a penalty point
10. Auction is canceled, all bidders are notified
11. Feedback window opens for bidder to provide feedback on seller

4 Use Cases

4.1 Use Case 1. Successful case

Use Case Name	Auction Success Case
Stakeholder	Bananacorp
Actors	Seller, Bidders
Preconditions	Seller has less than 3 penalty points
Main Success Scenario	1) Seller provides a valid start and end timings [Invalid start/end time] 2) Seller enters a valid reserve price [Invalid reserve price] 3) Seller enters a valid name [Invalid item description] 4) Auction begins 5) Bidders are allowed to place bids the item [Invalid bid placed] 6) Allocated time ends 7) Auction is closed, no more bids can be put through 8) Feedback window opens for bidders to provide feedback on the seller 9) Highest bid surpasses reserve price 10) Winning Bidder is notified
Extensions	[Invalid start/end time] (Errormsg: Invalid Time) Message is displayed prompting the user to renter a valid time [Invalid reserve price] (Errormsg: Invalid Reserve Price) Message is displayed prompting the user to renter a valid price [Invalid item description] (Errormsg: Invalid Item Description) Message is displayed prompting a user to re-enter a description for an item

4.2 Use Case 2. Failure Case

Use Case Name	Auction Failure Case
Stakeholder	Bananacorp
Actors	Seller, Bidders
Preconditions	Seller has less than 3 penalty points
Main Success Scenario	1) Seller provides a valid start and end timings [Invalid start/end time] 2) Seller enters reserve price [Invalid reserve price] 3) Seller enters a valid name and picture for item [Invalid item description] 4) Auction begins 5) Bidders are allowed to place bids the item [Invalid bid placed] 6) Allocated time ends 7) Auction is closed, no more bids can be put through 8) Feedback window opens for bidders to provide feedback on the seller 9) Highest bid does not surpass reserve price
Extensions	[Invalid start/end time] (Errormsg: Invalid Time) Message is displayed prompting the user to renter a valid time [Invalid reserve price] (Errormsg: Invalid Reserve Price) Message is displayed prompting the user to renter a valid price [Invalid item description] (Errormsg: Invalid Item Description) Message is displayed prompting the seller to re-enter the description

5 Use Case Diagram

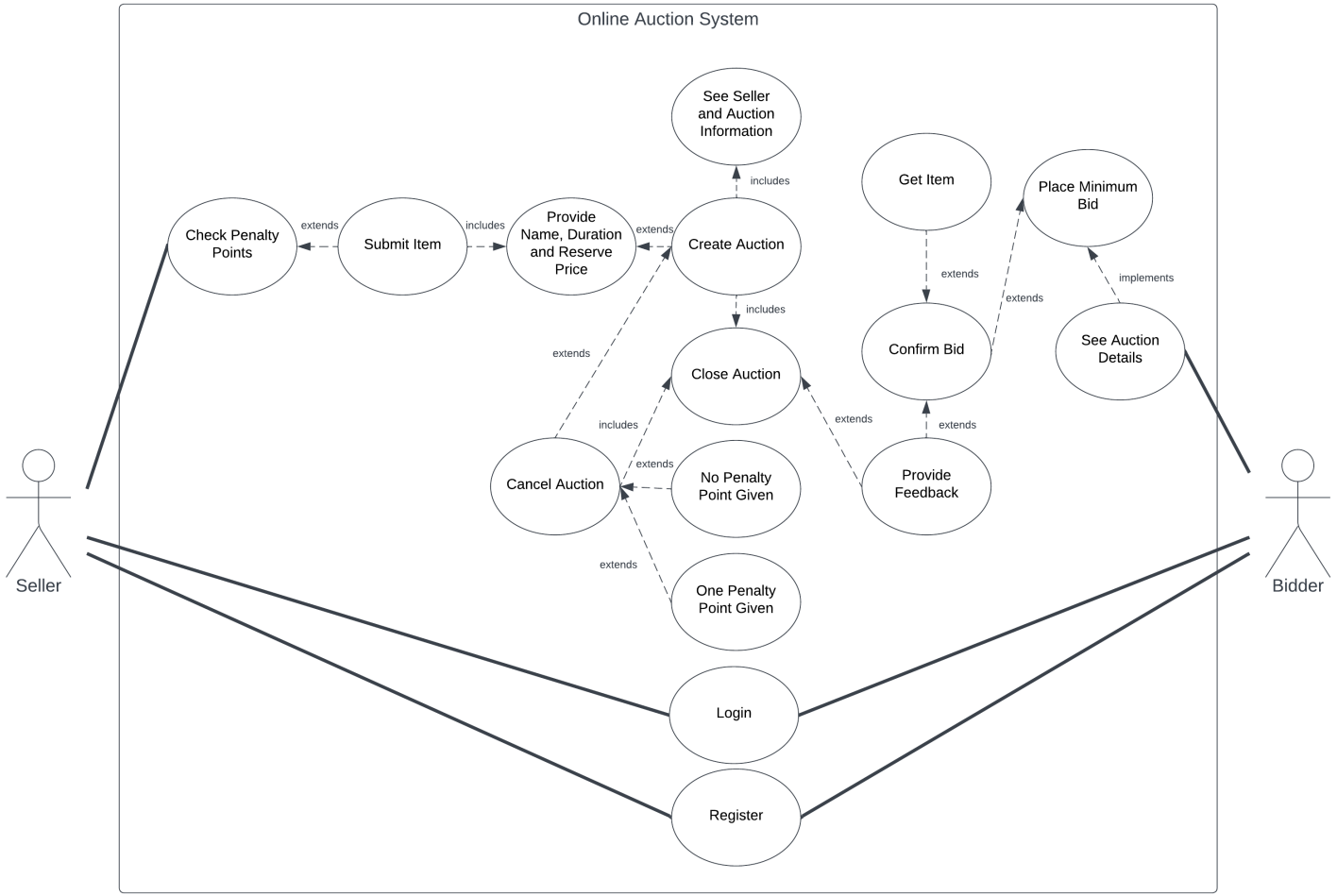

Figure 1: Use Case Diagram

6 Class Diagram

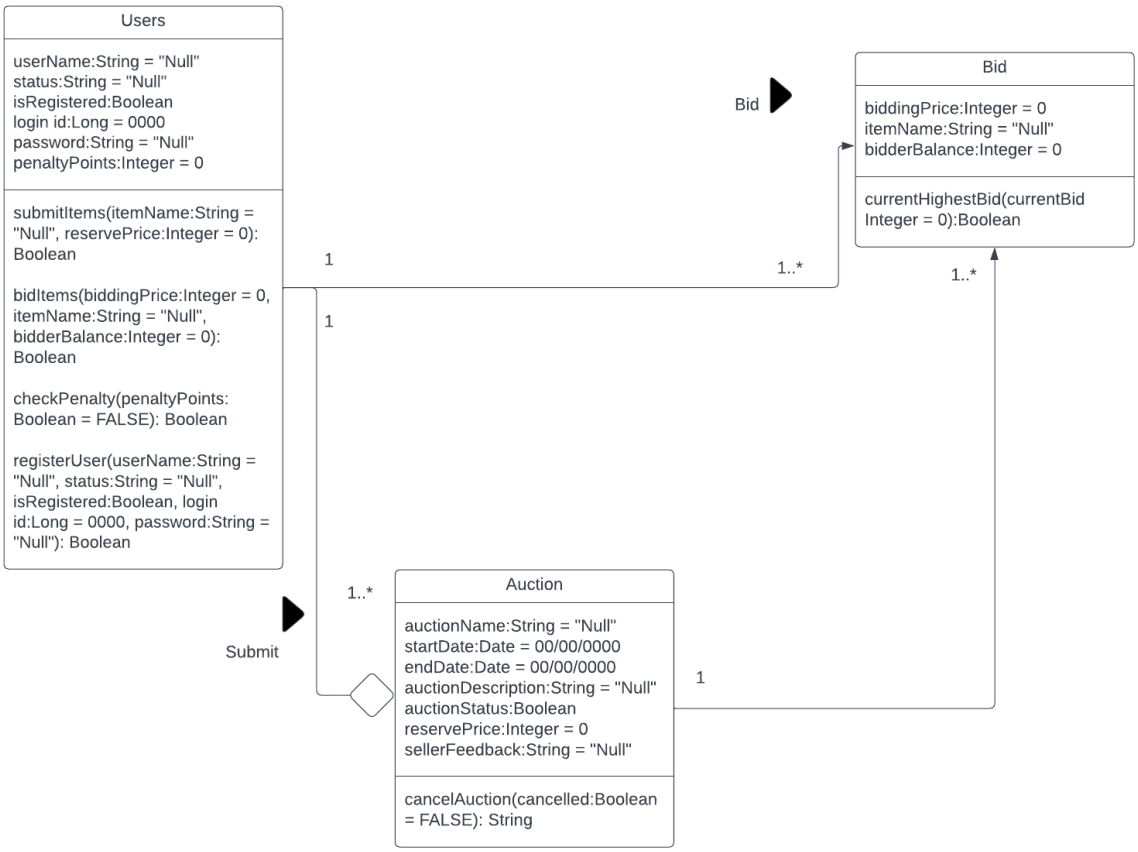

Figure 2: Class Diagram

7 Sequence Diagrams

7.1 Sequence Diagram 1. Success Use Case Diagram

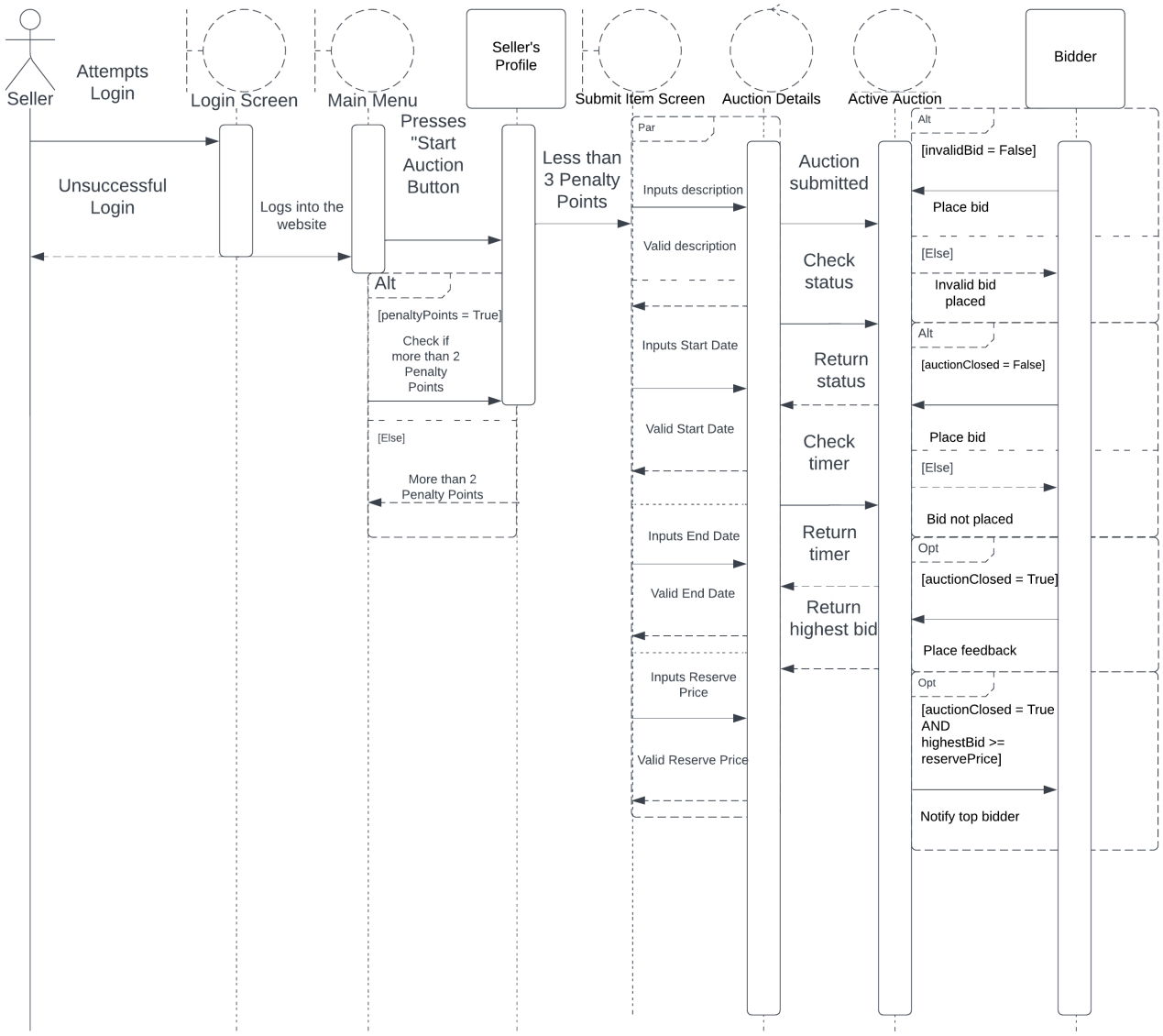

Figure 3: Sequence Diagram 1

7.2 Sequence Diagram 2. Failed Use Case Diagram

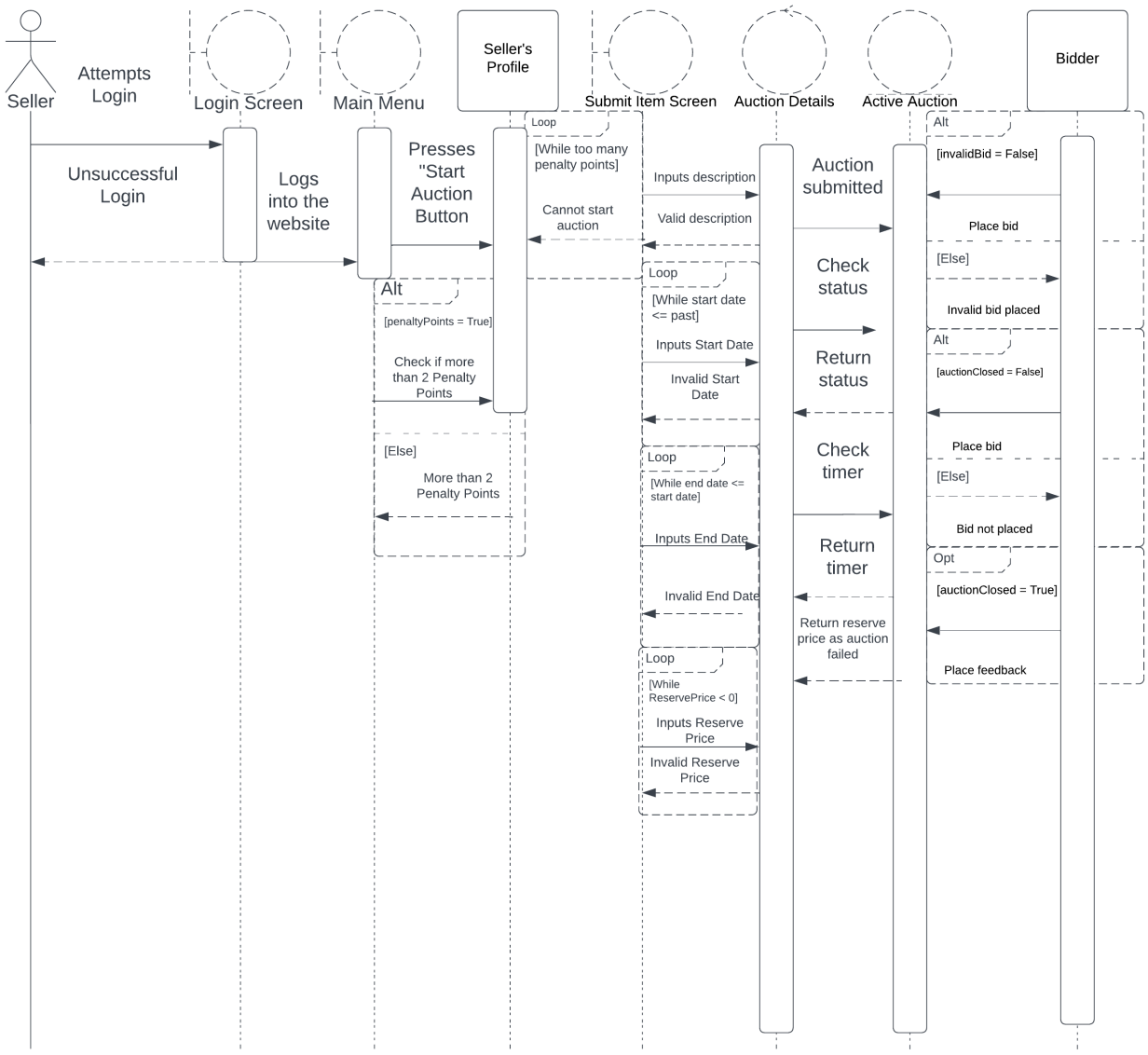

Figure 4: Sequence Diagram 2

8 Activity Diagram

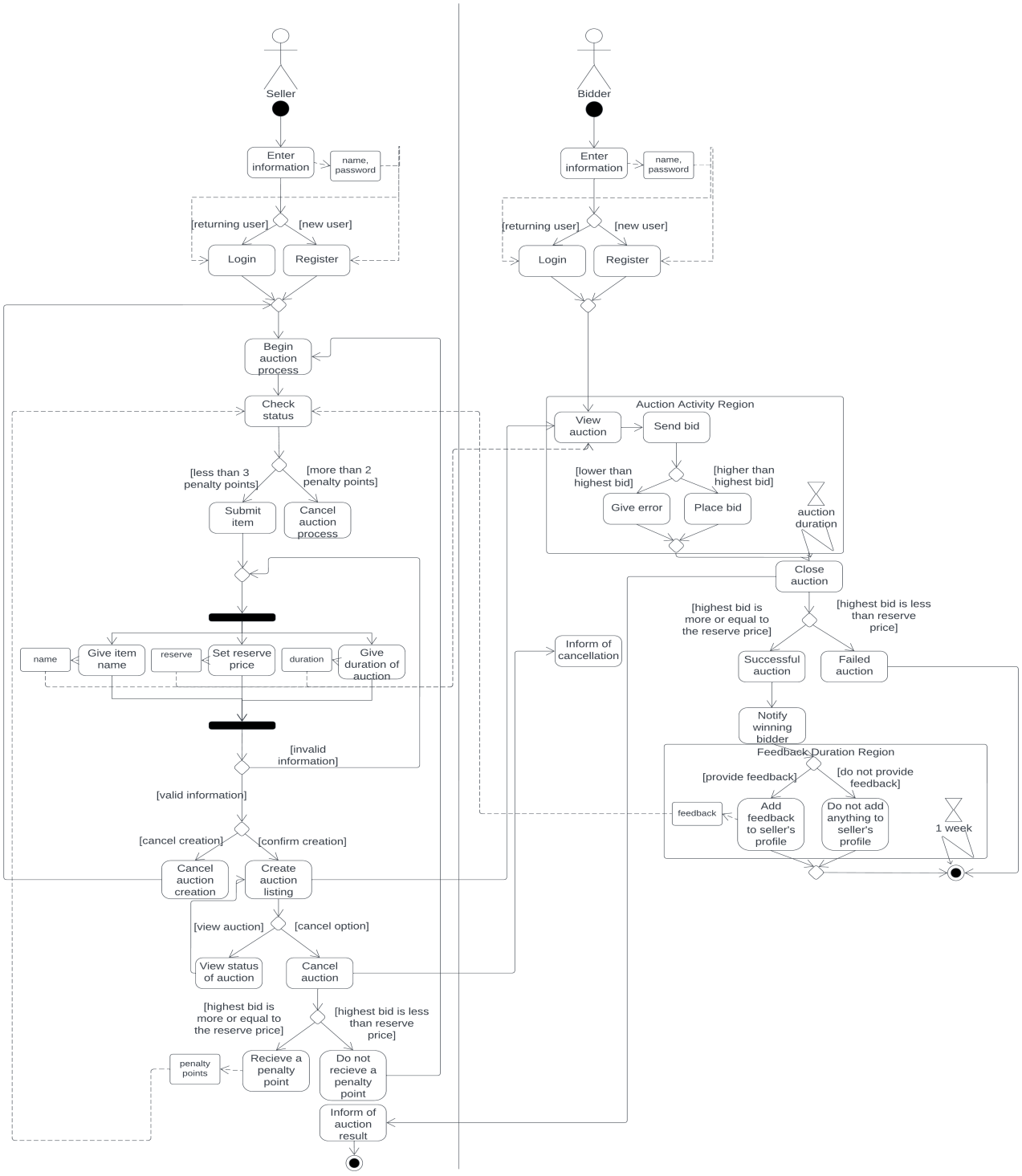

Figure 5: Activity Diagram

9 State Diagram

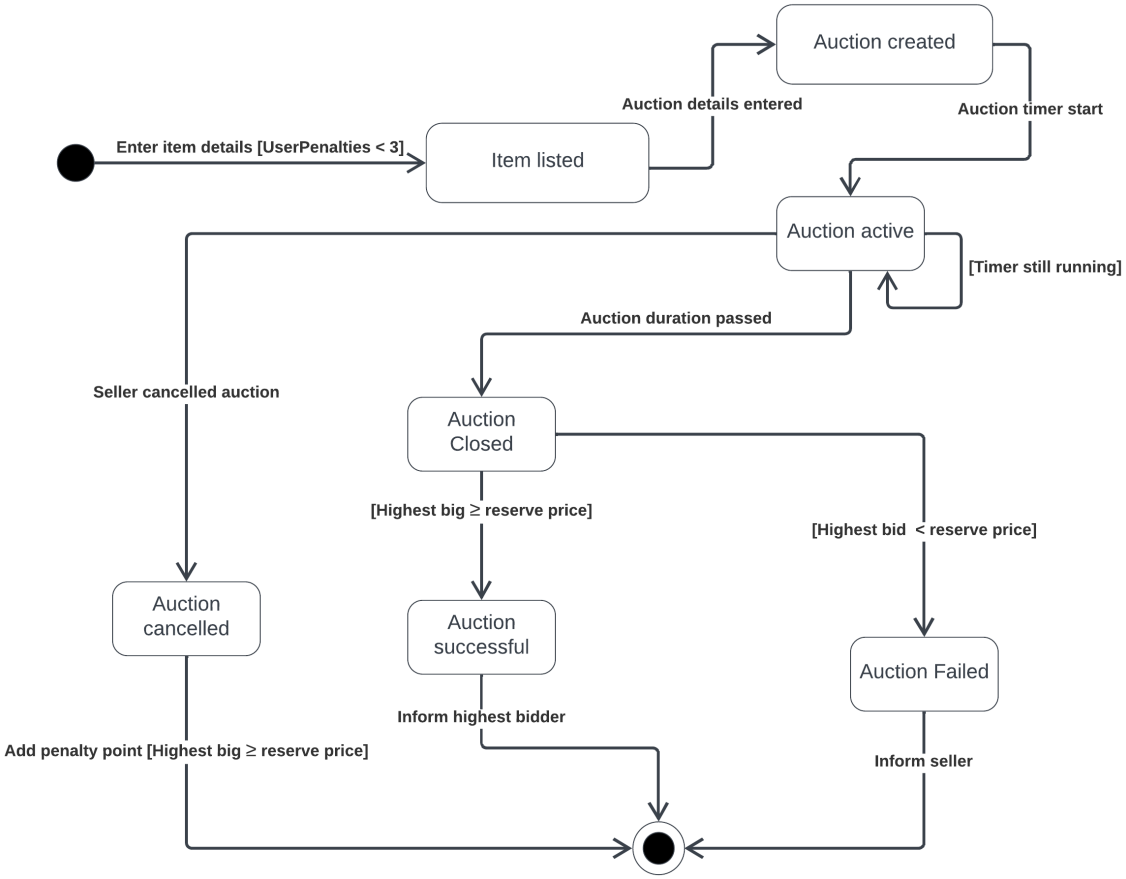

Figure 6: State Diagram
https://www.overleaf.com/project/63f5f7e25b036a3a28e38328