

1 Overview

In this assignment, you have to extend the contract(s) written by you in the first assignment to offer additional functionality of holding auctions. Additionally, you need to create a web based front end for users to interact with the dApp.

2 Auctions

You need to implement a modular auction design whereby the algorithm to decide the winner and payment scheme can be changed based on preference of the user holding the auction. (You are encouraged to refer to **Factory method pattern** in terms of software design for this task)

Following types of auctions needs to be supported -

1. **First-price sealed-bid auction**
2. **Vickrey auction/Second-price sealed-bid auction**
3. **Average price auction** - All bids are sealed-bids. The winner is the person who bids closest to the average of all received bids. The winner in average price auction pays what he/she bid.

3 Front End

All the functionality provided by your smart contract should be accessible using a web browser based front end. Additionally, if any off chain functions are being used, they need to be accessible using the front end as well.

4 Additional Requirements

1. **Test Cases:** Each submission should contain 4 sample test cases. These can be text based and need to demonstrate correctness of the programming logic.
2. **Commenting and Documentation:** All relevant code should properly be explained with **Doxygen comments**. Additionally, each submission should contain a brief about the programming logic.

5 Marking Scheme

1. Smart Contract (functionality excluding assignment 1 part) - 10%
2. Smart Contract (programming logic) - 15%
3. Secrecy (keeping bids secret during the bidding period) - 15%
4. Front End (functionality) - 30%
5. UX (should look good and be easy to use) - 20%
6. Commenting, Documentation and Test Cases - 10%

6 Resources

1. web3.js ([documentation](#)) - allows you to interact with a local or remote ethereum node using HTTP, IPC or WebSocket.
2. Metamask ([using metamask with truffle](#)) - chrome/firefox plugin. Allows you to sign and send transaction on behalf of your account.