A Game of Strategy

This project must be implemented in teams of 4. The socket programming paradigm should be used. For the implementation, Java, C or Python can be used.

The requirements are as follows,
1. There is one server and 3 clients.
2. Each client has the following suit of cards,

Client	Suit													
Client 1	Hearts	Ace (1)	2	3	4	5	6	7	8	9	10	Jack (11)	Queen (12)	King (13)
Client 2	Diamonds	Ace (1)	2	3	4	5	6	7	8	9	10	Jack (11)	Queen (12)	King (13)
Client 3	Clubs	Ace (1)	2	3	4	5	6	7	8	9	10	Jack (11)	Queen (12)	King (13)

The server has the following suit of cards in randomly shuffled order,

Server	Suit													
Server	Spades	Ace (1)	2	3	4	5	6	7	8	9	10	Jack (11)	Queen (12)	King (13)

3. The server maintains a score card as follows,

Round	Client 1 score	Client 2 score	Client 3 score
0 (Initialization)	0	0	0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

4. Each round in the game is going to be played as follows,

The server picks one card randomly from its suit and shows the card to each client (once this card is used by the server, it cannot be reused and must be discarded). Each client sees the card sent by the server and sends one of its cards to the server (once this card is used by the client, it cannot be reused and must be discarded). The server must wait till it receives one card from each client. Once all 3 cards are received by the server, it chooses the client who sent the highest value card and increments the score of that client with the value of the card that was advertised by the server.

5. At the end of 13 rounds, the server checks to see who has the highest points and advertises the winner to all the clients.
6. In case of a tie between players, the following rules should be implemented,

- If the winning card is the one of the tie (two players played the same card which was also the winning card), both players that played the winning card will get the points (the value of card that was advertised by the server in that round)
- If the winning card is not the one of the tie (two players played the same card but it was not the winning card), the tie is ignored and the third player who played the winning card will get the points
- If all the 3 players played the same card, all three players will get the points (the value of card that was advertised by the server in that round)

Examples of rounds played,

Example 1
The server advertised card (5, Spades)

Client 1 sent card (5, Hearts)
Client 2 sent card (4, Diamonds)
Client 3 sent card (6, Clubs)

Winner of the round: Client 3 (since it sent the highest value card among all clients)

Server increments the points of Client 3 by 5.

Example 2
The server advertised card (10, Spades)

Client 1 sent card (11, Hearts)
Client 2 sent card (10, Diamonds)
Client 3 sent card (11, Clubs)

Winner of the round: Client 1 and Client 3 (since both Clients 1 and 3 sent the winning card)

Server increments the points of Client 1 and Client 3 by 10.

Example 3
The server advertised card (2, Spades)

Client 1 sent card (3, Hearts)
Client 2 sent card (3, Diamonds)
Client 3 sent card (3, Clubs)

Winner of the round: Client 1, Client 2, and Client 3 (since all the clients sent the same card)

Server increments the points of Client 1, Client 2, and Client 3 by 2.

For extra credit implement the following,

The server must ensure that the card sent by each client is a new card that hasn't been sent by that client previously.

For any questions, please directly contact the TA (Gunveen Kaur Batra – gb368@njit.edu).