15-112 - Final Project Proposal for Ntali

1. Description of the project

My project is an online multiplayer recreation of the classic board game *Stratego*.

- The game is a strategic war between two armies, Red & Blue.
- Each Army consists of 39 soldiers of varying ranks (Rank 1 - highest - to Rank 9 - lowest - and a Spy), 6 bombs and 1 flag.
- The aim of the game is to find and capture the opposing team's flag .
- See below a photo of game pieces & game board
- Each player begins by setting up their half of the board using these pieces, and as the pieces all look the same and are stood up facing the player, the opposing player cannot tell which piece is which as all spaces in the 6x8 half of the board are full.
- Once both players are done placing their pieces, Red is the first to make a move, and then the players take alternating turns to make a move.
- A "move" can be one of two things:
    - Either the piece moves a single step (or multiple steps for piece No.9) into an empty space in any non diagonal direction
    - An "Attack", if an adjacent pace contains a piece from the opposing team (not a must to attack in such case).
- All pieces are movable except the bombs & flags.
- In an 'attack' both players reveal their pieces.
- The piece with the higher ranking remains, and the other is removed from the board.
- If both are of the same rank, both are removed.
- No.1 is the highest rank, No.9 is the lowest, and a bomb kills all if attacked, except No.8 which can "diffuse" it.
- The Spy is the only piece that can kill No.1 (other than No.1) if and only if the spy strikes first.
- The game ends when a flag is captured or no movable pieces remain.

2. Libraries and features that you will be using/implementing

- Idea for General Structure
    - Class for Login screen - login to server (HW#8)
    - Class for Home screen - instructions, list of available users to play against, list of match requests from users, results of last 5 matches, and a leaderboard of all players.
    - Class for Set-up screen - Once a request has been accepted, both players view separate setup screens where they view all their own game pieces and are able to place on battleground. Once both are done, view next screen. Timeout after 15 mins.

    - Class for Match Screen - Choose a location to move into or piece to attack. View other players movements, and view both sides' losses on the side.
    - Class for Game Pieces - define rank, availability and movement of a peice
- Program must continuously check for messages:
    - Opposing player moved a piece
    - Opposing player is attacking a piece of yours
    - Result of attack (pieces eliminated)
    - Point Updates
    - Match Requests
- Most probably will be using Pygame Library to implement game features, and/or Tkinter for login & home page

3. Description of the user interface for the project

My aim is to implement this game with a user-friendly graphical user interface.

- The game is played online using the server used previously for the chat client.
- A player must login to view the home page.
- The game homepage will include instructions, a list of available users to play against, list of match requests from users, results of last 5 matches, and a leaderboard of all players.
- Players receive 30 points for a win, 20 for a tie and 10 for a loss.
- A user will be able to select another user to play against from the available user list. The program will use the chat client to send the Game Request to that user.
- One the request is accepted, each player will be able to set up their half of the board with their 46 pieces.
- The requesting player is always red and opponent is blue.
- Once both players are done, they will both see the entire board with the opponents pieces concealed.
- The players will take alternating turns, and a move must be made within a maximum of 100 seconds. If time runs out without making a move the other player automatically wins and the game is terminated.
- Both players will be able to watch their opponents pieces move, but will only reveal them through attacks and so technically each player will be viewing different but coordinated screens.
- Each player will be able to click on an empty square to move into it or select an adjacent piece to attack.
- When a player attacks, both players will see the ranks of each piece for 10 seconds and the winning piece remains while the losing piece is moved to the side, where both teams will be able to track losses for both sides.
- At the end of the game, both users will receive respective points and the leaderboards will be updated with the new scores.
- Points will be updated in the following manner:
    - When each user gains points, their total is broadcasted to all users.

        - When a user receives another user's total, it is updated and stored in a file on their machine.
        - The program continuously checks for updates while also sorting the scores in the file to produce the leader board when a new update is received.
- The users last 5 matches are also saved with results in a separate file on their machine with the timestamp and results.

4. Set of features (with descriptions) that you will implement and demo by first milestone date of November 24.

- By November 24th, my aim is to have completed the basic skeleton of the game with very basic quality graphics, implementing the game logic and applying it using socket programming.

5. Final set of complete features (with descriptions) that will be part of your final submission and demo by Monday Dec 2.

- By December 2nd, my aim is to improve the quality of the graphics as well as add on the extra features on the home page such as the leaderboard and record of last 5 matches played.

STRATEGO
STRATEGO

STRATEGO®

(Pronounced STRA-TE-GO)

A Game of Skill and Strategy for two players.

STRATEGO is the American version of the game most popular on the Continent. While the pieces have military designs and are maneuvered across the playing board, it is not a war game.

STRATEGO is a fast moving game which is easy to learn, delightful to play and which provides a never-ending variety of ways to outwit your opponent. The colorful playing pieces are marked according to military rank which are kept hidden from the opponent as they are placed and moved across the board to capture your opponent's "Flag". The rank of the piece is revealed only when an opposing piece is "struck" or attacked. The higher ranked piece removes the lesser rank. There are "Bombs" which "blow-up" and remove any attacking piece except the "Miner" who can dismantle and remove the "bomb". Even the "Marshal", the highest ranking piece, has a weakness, in that the lowly "Spy" can remove him from the board.

The exciting elements of skillful planning, clever deception, memory and suspense make STRATEGO a thoroughly delightful game.

RULES FOR STRATEGO

The OBJECT of the game is to capture the opponent's flag.

TO START THE GAME:

1. Place the board between the players so that the name STRATEGO is facing each opponent.
2. One player takes the Red and the other the Blue playing pieces. RED starts first.
3. Each player gets an army of 40 pieces, in order of rank from high to low, consisting of:

These are all movable pieces.

There are also 6 Bombs and 1 Flag which are not movable.

Note that the movable pieces have a number in the upper left corner to designate the order of rank. Thus, the Marshal is ranked 1 (highest), the General 2, the Colonels 3, and so on to the Spy who is marked with an "S".

4. The players place one piece in each square of their half of the board. All squares are to be filled from each end. That is, 10 per row, 4 rows deep. The two middle rows are to be left unoccupied at the start of the game.
5. The pieces are placed with the notched ends up and the printed emblem facing the player in such a way that the opponent does not know the arrangement of the pieces.
6. Read the rules of "Movement" and "Striking" so that an idea of how to plan the placement of pieces will be obtained.

RULES FOR MOVEMENT

1. Turns alternate, first Red then Blue.
2. A piece moves from square to square, one square at a time. (Exception: Scout — see rule 8) A piece may be moved forward, backward, or sidewards but NOT DIAGONALLY.
3. Note that there are two lakes in the center of the board, which contain NO SQUARES. Pieces must move around lakes and cannot move where there is no square.
4. Two pieces may not occupy the same square at the same time.
5. A piece may not move through a square occupied by a piece nor jump over a piece.
6. Only one piece may be moved in each turn.
7. The "Flag" and the "Bomb" pieces CANNOT be moved. Once these pieces are placed at the start of the game they MUST REMAIN IN THAT SQUARE.
8. The "Scout" may move any number of OPEN squares forward, backward, or sidewards in a straight line if the player desires. This movement, of course, then reveals to the opponent the value of that piece. Therefore, the player may choose to move the Scout only one square in his turn, so as to keep the Scout's identity hidden. The Scout is valuable for probing the opponent's positions. The Scout MAY NOT MOVE & STRIKE in the same turn.
9. Once a piece has been moved to a square and the hand removed, it cannot be moved back to its original position in that turn.
10. Pieces CANNOT be moved back and forth between the same 2 squares in 3 consecutive turns.
11. A player must either "move" or "strike" in his turn.

RULES FOR "STRIKE" OR ATTACK

1. When a red and a blue piece occupy adjoining squares either back to back, side to side, or face to face, they are in a position to attack or "strike". NO DIAGONAL strikes can be made.
2. A player may MOVE in his turn or STRIKE in his turn. HE CANNOT DO BOTH. The "strike" ends the turn. After pieces have finished the "strike" move, the player who was struck has his turn to move or strike.
3. It is NOT required to "strike" when two opposing pieces are in position. A player may decide to strike, whenever he desires.
4. Either player may strike (in his turn), not only the one who moved his piece into position.
5. To strike (or attack), the player, whose turn it is, takes up his piece and lightly "strikes" the opponent's piece while at the same time declaring his piece's rank. The opponent answers by naming the rank of his piece.
6. The piece with the lower rank is lost and removed from the board. The winning higher ranking piece is then MOVED IMMEDIATELY INTO THE EMPTY SQUARE PERMANENTLY OCCUPIED BY THE LOSING PIECE.
7. When equal ranks are struck, then BOTH pieces are lost and removed from the board.
8. A Marshal removes a General, a General removes a Colonel, a Colonel removes a Major and so on down to the Spy, which is the lowest ranking piece.
9. The Spy, however, has the special privilege of being able to remove only the Marshal provided he strikes FIRST. That is, if the Spy "strikes" the Marshal in his turn, the Marshal is removed. However, if the Marshal "strikes" first, the Spy is removed. All other pieces remove the Spy regardless of who strikes first.
10. When any piece (except a Miner) strikes a Bomb (thus) that piece is lost and is removed from the board. The Bomb does NOT move into the empty square, but remains in its original position at all times. When a Miner strikes a Bomb, the Bomb is lost and the Miner moves into the vacated square.
11. A Bomb cannot strike, but rather must wait until a movable piece strikes it.
12. Remember, the Flag also can never be moved.

TO END THE GAME

Whenever a player "strikes" his opponent's flag, the game ENDS and he is the WINNER.

Note: If a player cannot move a piece or "strike" in his turn, he must give up and declare his opponent the winner.

SOME SUGGESTIONS FOR STRATEGY

From the above it is clear that the original placement of the pieces can determine the outcome. It is therefor good defensive tactics to surround the Flag with a few Bombs. However, to mislead the opponent, it is recommended to place a few Bombs at some distance from the Flag.

A few high ranking pieces in the front lines is a good idea, but the player who rapidly loses his high officers stands in a weak position.

Scouts in the front line are useful to probe the strength of the opposing pieces.

Miners are very important near the end of the game so it is good strategy to place some in the rear ranks.

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