CS449 Sprint 1 Report

Michael Cu, Elias Julian Marko Garcia, Samual Lim

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1 Micro Charter

N Men Morris

Vision Statement

Create a extensible framework for board game web apps with scalability and performance.

Mission Statement

To play Nine Men's Morris on the web browser using a composable web technology stack that allows for future modularity while not foregoing performance.

Elevator Pitch and Business Value

We are creating Nine Men's Morris on a board game framework using Express.js and Neon for Rust. This allows for a data and type safe application that is capable of composability, scalability, extensibility, and performance.

Customers and Users

- Customers: Entrepreneurs and ventures that want to deploy board games on the web with low overhead, latency, and maintenance.
- Users: Individuals who are passionate about board games and want a new online experience that they can take and play wherever they go with their friends.

Metrics

By benchmarking N Men Morris, we can compare our solution to other products on the market on:

1. latency
2. binary size
3. up-time

Milestones

1. First MVP
2. First Offline N Men's Morris
3. Player versus Player (Offline)
4. Player versus Player (Online)

Risks

1. Inherent complexity of technology stack.
2. Inability to cooperate with teammates.
3. Plausibility of orphaning project due to development team size.

Authors

- Michael Cu
- Elias Julian Marko Garcia
- Samual Lim

2 User Stories

Below you will find a table that makes up our "User Story Board", with some simplifications taken with respect to the total contents of the board. With respect to the final formal documentation, i.e. this paper, we only keep the basic qualitative and quantitative values for each story in the table while giving each user story proper its own section. This makes documenting each

story less unruly while also easier to read. Each Story I.D. (SID) value is internally linked to its respective story, which also helps with navigating this section.

SID	Story Name	Priority	Time Est. (hr)	Actual (hr)	Status	Developer(s)
S1	Mills Board	high	10	4	DONE	Sam, Michael, Elias
S2	User Input and Selection	high	10	4	DONE	Sam
S3	Starting a Game	medium	10	-	TODO	-
S4	Assigning Players	medium	10	-	TODO	-
S5	Piece Placement	high	10	2	TODO	Sam, Michael
S6	Piece Movement	medium	10	-	TODO	-
S7	Mill Formation	medium	10	-	TODO	-
S8	Piece Elimination	medium	10	-	TODO	-
S9	Flying Pieces	medium	10	-	TODO	-
S10	Defining End Game	medium	10	-	TODO	-
S11	Restarting/Replaying Game	medium	10	-	TODO	-

2.1 Mills Board

Description

As a user, I need an empty board consisting of 4 expanded squares with 8 equidistant positions each to play a game of Nine Men's Morris.

2.2 User Input and Selection

Description

As a user, I need to be able to select and choose input from the web GUI of the application to be able to play and take turns at Nine Men's Morris.

2.3 Starting a Game

Description

As a user, I need a GUI to prompt me with the options to start a game with either another human or against the computer for Nine Men's Morris in order to play the game.

2.4 Assigning Players

Description

As a user, I need to be assigned the role as either the first or second player, whether against another human or the computer, in order to know my player turn (either first or second) in the game.

2.5 Piece Placement

Description

As a user, I need to place nine pieces on unoccupied positions in turn with another player to start off a game of Nine Men's Morris.

2.6 Piece Movement

Description

As a user, I need to be able to move my pieces into adjacent positions that are not occupied by the other player or adjacent to their mill in order to take a turn.

2.7 Mill Formation

Description

As a user, I need the game to recognize that I have formed a mill upon moving three of my own pieces into adjacent positions so that I may gain the future ability to attack and defend my mill pieces from being eliminated.

2.8 Piece Elimination

Description

As a user, after forming a mill, I need the ability to remove an opponent's piece of my choosing so long as either it is not in a mill or any piece given all available pieces are in a mill, so that I may appropriately attack my opponent.

2.9 Flying Pieces

Description

As a user, upon reaching three remaining pieces, I need the ability to fly (jump) my pieces across the board to any un-occupied point in order to play Nine Men's Morris according to the rules. Whether the position is guarded is a variant of the game, implementation decision TBD.

2.10 Defining End Game

Description

As a user, when either myself or the opponent reaches less than three pieces, i.e. two pieces, I need the game and to declare the respective winner in order to successfully finish a game of Nine Men's Morris.

2.11 Restarting and Replaying a Game

Description

As a user, after having completed a game of Nine Men's Morris, I need the GUI to prompt me to either play again or to end the game software so that I can accordingly choose whether to keep playing or to end my game session.

[Template User Story]

Description

Priority

Estimate

Actual

Status

Developer

3 Acceptance Criteria

The following section covers the acceptance criteria enumerated in response to the User Stories discovered and documented in §2. In a similar fashion to §2, the table documenting these acceptance criteria is in a simplified form. Every Acceptance Criterion has an Acceptance Criterion ID (`ACID`), which

is associated in the table below with its respective `SID`, development status, and the developers responsible for implementing it. Each `ACID` is linked to its respective subsection below for viewing the description of each criterion.

SID & Name	ACID	Status	Developer(s)
1 Mills Board	A1	DONE	Sam, Elias, Michael
2 User Input and Selection	A2	DONE	Sam, Elias, Michael
3 Starting a Game	A3	TODO	-
4 Assigning Players	A4	TODO	-
5 Piece Placement	A5	DONE	Sam, Michael
6 Piece Movement	A6	TODO	-
7 Mill Formation	A7	TODO	-
8 Piece Elimination	A8	TODO	-
9 Flying Pieces	A9	TODO	-
10 Defining End Game	A10	TODO	-
11 Restarting/Replaying Game	A11	TODO	-

3.1 Criterion 1

ACID	Description
1.0	Given a User...
1.1	When the User visits our site (IP), then an interactive board will appear.
1.2	When the User does not visit our site (IP), our board will not appear.

Further Notes

None for now.

Criterion 2

ACID	Description
2.0	Given a User using the application...
2.1	When a user clicks on an interactive button of the application's page, then the application will detect the user input event.
2.2	When a user clicks on a non-interactive button of the application's page, then the application will not detect any input.

Further Notes

None for now.

3.2 Criterion 3

ACID	Description
3.0	Given a User using the application...
3.1	When a user enters HUMAN as an opponent, then the application will allow for a second human player.
3.2	When a user enters AI as an opponent, then the application will assign an AI as a second player.
3.3	When a user chooses neither a HUMAN or AI as an opponent then the application will not choose and will re-prompt the user to choose an opponent type.

Further Notes

None for now.

3.3 Criterion 4

ACID	Description
4.0	Given a User using the application...
4.1	When a user chooses player one, then the application will assign the role of player one to the user.
4.2	When a user chooses player 2, then the application will assign the role of player two to the user.
4.3	When a user chooses neither player one or player two then the application will not will not assign a player and the player will be re-prompted

Further Notes

None for now.

3.4 Criterion 5

ACID	Description
5.1.0	Given a User playing a game with unassigned pieces...
5.1.1	When the user enters an unoccupied position, a piece of the users color will be placed in the position.
5.1.2	When the user enters an occupied position, a piece of the users color will not be placed in the position..
5.2.0	Given a User playing a game with no unassigned pieces...
5.2.1	When the user enters an unoccupied position, a piece of the users color will not be placed in the position.
5.2.2	When the user enters an occupied position, a piece of the users color will not be placed in the position..

Further Notes

None for now.

3.5 Criterion 6

ACID	Description
6.0	Given a user playing the game during their turn...
6.1	When the user moves his piece to an unoccupied position not adjacent to an opponent mill, then the piece will be shifted.
6.2	When the user moves his piece to an occupied position not adjacent to an opponent mill, then the piece will not be shifted.
6.3	When the user moves his piece to an unoccupied position, adjacent to an opponent mill, then the piece will not be shifted.
6.4	When the user moves his piece to an occupied position, adjacent to an opponent mill, then the piece will not be shifted.

Further Notes

None for now.

3.6 Criterion 7

ACID	Description
7.0	Given a User is playing their turn...
7.1	When the user places a piece in a valid position adjacent to two other pieces of their color, then a mill will be formed.
7.2	When the user places a piece in an invalid position adjacent to two other pieces of their color, then a mill will not be formed.

Further Notes

None for now.

3.7 Criterion 8

ACID	Description
8.0	Given a User is playing their turn...
8.1	When the user moves a piece from his mill into an opponent's piece not in a mill, the opponent's piece will be replaced by the user's piece.
8.2	When the user moves a piece from his mill into an opponent's piece in a mill, the opponent's piece will be not replaced by the user's piece.
8.3	When the user moves a piece from his mill into a vacant space, no opponent's piece will be replaced by the user's piece.

Further Notes

None for now.

3.8 Criterion 9

ACID	Description
9.0	Given a User is playing their turn...
9.1	When the user loses a piece such that they only have three pieces remaining on the board, then the application will allow them to "fly" their pieces to any open and valid position on the board.
9.1	When the user loses a piece such that they have more than three pieces remaining on the board, then the application will not allow them to "fly" their pieces to any open and valid position on the board.

Further Notes

None for now.

3.9 Criterion 10

ACID	Description
10.0	Given a User is playing their turn...
10.1	When the user eliminates an opponent's pieces down to two pieces, then the user wins.
10.2	When the user's pieces are eliminated down to two pieces, then the user loses.

Further Notes

None for now.

3.10 Criterion 11

ACID	Description
11.0	Given a user after they have completed a game...
11.1	When the user chooses to play again, then the board will be reset and game count incremented.
11.2	When the user chooses not to play again, then the board will not be reset and game count not incremented.

Further Notes

None for now.

[TEMPLATE, Remove UNNUMBERED prop] Criterion N

ACID	Description
1	
1.0	

Further Notes

4 Implementation Tasks

This section summarizes the details of implementation tasks for the project.
You will find in each subsection a table similar to those found in §2 and §3.

4.1 Summary of Production Code

SID & Name	ACID	Class Name(s)	Developer(s)	Status	Notes
1	2	Qux	Daz	Qud	Foo

4.1.1 Class `QUX`

Class summary goes here.

Method	Notes
Bizz	blah blah blah

[TEMPLATE] Class `FOOBAR`

Class summary goes here.

Method	Notes
Qud	blah blah blah

4.2 Automated Test Code

SID & Name	ACID	Class Name(s)	Method Name(s)	Description	Status	Developer
1	2	Foo	Bar	Fizz	Buzz	Quz

4.3 Manual Test Code

SID & Name	ACID	Test Input	Test Oracle	Status	Notes	Developer(s)
1	2	Fizz	Fuzz	Quz	Bar	Qud

4.4 Other Manual Test Code

ID	Test Input	Expected Result	Class Name	Method Name of Test	Status	Developer
1	Foo	Bar	Fuzz	Quz	Fizz	Bazz

5 Meeting Minutes