**Team Project Sprint #2**

Team Name:

|  |  |  |  |
| --- | --- | --- | --- |
| **Information provided by the student team** | | **To be used by grader** | |
| **Student name** | **Specific contributions to this sprint** | **Team Score** | **Individual Score** |
| Mannava Jyothi Krishna | Developed the core game logic (game\_logic.py), including piece placement, move handling, and mill detection. |  |  |
| Mannava Vignesh | Designed and implemented the graphical user interface (gui.py), ensuring a clear, organized, and visually engaging layout. |  |  |
| Shaik Sumayya Fathima | Created and expanded automated test cases (test\_game.py) to validate game functionalities. Assisted with GUI refinement (gui.py). |  |  |
| Shreya Saraf | Managed project integration, documentation, coordinated team meetings, and assisted with developing game logic (game\_logic.py). |  |  |

A student without specific contributions shall not receive credit.

1. **Updated User Stories**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **User Story Name** | **User Story Description** | **Priority** | **Estimated effort (hours)** | **Actual effort (if completed)** | **Status (completed, toDo, inProgress)** | **Developer names** |
| 1 | Board Visualization | As a player, I want to see a clear and organized game board to easily identify where to place my pieces. | High | 5 | 5 | Completed | Mannava Vignesh |
| 2 | Piece Placement | As a player, I want to place my pieces on the board to participate in the game. | High | 8 | 8 | Completed | Mannava Jyothi Krishna, Mannava Vignesh |
| 3 | Invalid Move Handling | As a player, I want to receive an error message when I attempt to place a piece on an occupied | Medium | 4 | 4 | Completed | Mannava Jyothi Krishna |
| 4 | Turn Switching | As a player, I want the game to switch turns after a successful move to ensure fair play for both players. | High | 3 | 5 | Completed | Mannava Vignesh, Shaik Sumayya Fathima |
| 5 | Mill Formation Detection | As a player, I want the game to detect when I form a mill so I can remove an opponent's piece. | Medium | 5 | 5 | Completed | Mannava Vignesh, Shreya Saraf |
| 6 | Replay and record | As a player, I want the game to record when I press record and replay it, with options of taking a step back and moving a step forward | Medium | 10 | 10 | Completed | Sumayya Fathima |
| 7 | Save game and Restart | As a player, I want the game to be saved in a JSON file and then reload it and continue | Medium | 8 | 8 | Completed | Mannava Vignesh |
| 8 | AI Piece Placement | As a computer opponent, I want to place a piece on the board so that I can play against the human player. | High | 8 | 8 | To Do in Sprint 3 | Mannava Jyothi Krishna |
| 9 | Computer Piece Movement | As a computer opponent, I want to move my pieces during the movement phase to simulate gameplay in phases 2 and 3. | High | 8 | 8 | To Do in Sprint 3 | Sumayya Fathima |
| 10 | Decision-Making (Minimax) | As a computer opponent, I want to make intelligent moves based on a minimax algorithm with alpha-beta pruning to challenge the human player effectively. | Medium | 12 | 12 | To Do in Sprint 3 | Shreya Saraf |
| 11 | Mill Detection for Computer vs Human | As a computer opponent, I want to detect when a mill is formed so that I can remove an opponent's piece. | Medium | 6 | 6 | To Do in Sprint 3 | Shreya Saraf |
| 12 | Record Replay for Computer vs Human | As a player, I want the game to record when I press record and replay it, with options of taking a step back and moving a step forward | Medium | 8 | 8 | To Do in Sprint 3 | Mannava Jyothi Krishna |

1. **Updated Acceptance Criteria (AC)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **User Story ID and Name** | **AC**  **ID** | **Description of Acceptance Criterion** | **Status (completed, toDo, inPprogress)** | **Developer Names** |
| 1. Board Visualization | 1.1 | Given the game starts, When the GUI is launched, Then the board should display all 24 positions in an organized layout. | Completed | Mannava Vignesh |
|  | 1.2 | Given the board is displayed, When a player places a piece, Then the piece should appear at the selected position with the correct color. | Completed | Mannava Jyothi Krishna, Mannava Vignesh |
| 2. Piece Placement | 2.1 | Given it is a player's turn, When the player clicks on an empty position, Then a piece should be placed, and the turn should switch. | Completed | Mannava Jyothi Krishna |
|  | 2.2 | Given a player has placed all 9 pieces, When the player attempts to place another piece, Then an error message should indicate no pieces left. | Completed | Mannava Vignesh, Shaik Sumayya Fathima |
| 3. Invalid Move Handling | 3.1 | Given a position on the board is occupied, When a player attempts to place a piece there, Then an error message should be displayed. | Completed | Mannava Vignesh |
| 4. Turn Switching | 4.1 | Given a player successfully places a piece, When the move is completed, Then the turn switches to the opposing player. | Completed | Mannava Vignesh, Shreya Saraf |
| 5. Mill Formation Detection | 5.1 | Given a player places a piece that completes a mill, When the mill is formed, Then the player should be prompted to remove an opponent's piece. | Completed | Mannava Jyothi Krishna, Shreya Sara |
|  | 5.2 | Given a mill has been formed, When the player removes an opponent's piece, Then the opponent's piece is removed, and turn switches. | Completed | Mannava Jyothi Krishna, Shreya Saraf |
| 6. Replay and Record | 6.1 | Given the game is in progress, When the player clicks record, Then the game should record each move for replay functionality. | Completed | Shaik Sumayya Fathima |
|  | 6.2 | Given a recorded game, When the player selects replay, Then the moves should play back sequentially with options to step forward or back. | Completed | Shaik Sumayya Fathima |
| 7. Save Game and Restart | 7.1 | Given the player chooses to save the game, When saved, Then the game state should be saved in a JSON file with all relevant details. | Completed | Mannava Vignesh |
|  | 7.2 | Given a saved game file, When loaded, Then the game should reload with all pieces, moves, and turns correctly in place. | Completed | Mannava Vignesh |
| 8. AI Piece Placement | 8.1 | Given it is the AI’s turn, When the AI chooses a position, Then the AI places a piece at the selected position without errors. | To Do in Sprint 3 | Mannava Jyothi Krishna |
| 9. Computer Piece Movement | 9.1 | Given it is the AI’s turn in phases 2 or 3, When the AI decides to move a piece, Then the piece moves to a valid, available position. | To Do in Sprint 3 | Shaik Sumayya Fathima |
| 10. Decision-Making (Minimax) | 10.1 | Given it is the AI’s turn, When the board state is evaluated, Then the AI selects the best move using the minimax algorithm with alpha-beta pruning. | To Do in Sprint 3 | Shreya Saraf |
| 11. Mill Detection for Computer vs Human | 11.1 | Given a mill is formed by the AI, When the mill is detected, Then the AI removes an opponent's piece as allowed. | To Do in Sprint 3 | Shreya Saraf |
| 12. Record Replay for Computer vs Human | 12.1 | Given a game with human vs computer mode, When replayed, Then all moves should be recorded and replayable. | To Do in Sprint 3 | Mannava Jyothi Krishna |

1. **Updated Implementation Tasks**

Include the tasks from the previous report and highlight the new tasks with a different color.

Summary of production code

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User Story ID and Name** | **AC ID** | **Class Name(s)** | **Method Name(s)** | **Developer Name(s)** | **Status** | **Notes (optional)** |
| 1. Board Visualization | 1.1 | GameGUI | calculate\_positions, create\_board | Mannava Vignesh | Completed | Organized layout of board positions |
|  | 1.2 | GameGUI | update\_board | Mannava Vignesh | Completed | Correct piece placement and color |
| 2. Piece Placement | 2.1 | Game, GameGUI | place\_piece, handle\_click | Mannava Jyothi Krishna | Completed | Turn switching implemented |
|  | 2.2 | Game | place\_piece | Mannava Vignesh | Completed | Error message on exceeding piece limit |
| 3. Invalid Move Handling | 3.1 | Game | place\_piece, handle\_click | Mannava Vignesh | Completed | Error displayed for occupied positions |
| 4. Turn Switching | 4.1 | Game | switch\_player | Mannava Vignesh, Shreya Saraf | Completed | Turn switch functionality |
| 5. Mill Formation Detection in Human Vs Human | 5.1 | Game, GameGUI | check\_mill, prompt\_remove\_pieceMannava Jyothi | Mannava Jyothi Krishna, Shreya Saraf | Completed | Mill detection and prompt |
|  | 5.2 | Game | remove\_piece, handle\_remove\_click | Mannava Jyothi Krishna, Shreya Saraf | Completed | Piece removal after mill formation |
| 6. Replay and Record | 6.1 | Game, GameGUI | start\_recording, play\_replay | Shaik Sumayya Fathima | Completed | Record and replay functionality |
|  | 6.2 | GameGUI | step\_forward, step\_back | Shaik Sumayya Fathima | Completed | Replay controls for navigation |
| 7. Save Game and Restart | 7.1 | Game | save\_game, load\_game | Mannava Vignesh | Completed | JSON-based game state saving |
| 8. AI Piece Placement | 8.1 | Computer Player | get\_move | Mannava Jyothi Krishna | To Do | Initial position logic for AI |

Summary of automated test code (directly corresponding to some acceptance criteria)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User Story ID and Name** | **Acceptance Criterion ID** | **Class Name (s) of the Test Code** | **Method Name(s) of the Test Code** | **Description of the Test Case (input & expected output)** | **Status** | **Developer Name(s)** |
| 1. Board Visualization | 1.1 | TestGameGUI | test\_board\_display | Verify the board displays all positions in an organized layout | Completed | Shaik Sumayya Fathima |
| 2. Piece Placement | 2.1 | TestGamePiecePlacement | test\_piece\_placement | Place pieces and verify placement and turn switching | Completed | Shaik Sumayya Fathima |
| 3. Invalid Move Handling | 3.1 | TestGamePiecePlacement | test\_invalid\_move\_handling | Attempt to place on occupied position, expect failure message | Completed | Shreya Saraf |
| 5. Mill Formation Detection | 5.1 | TestGamePiecePlacement | test\_mill\_detection | Form mill and verify mill detection and removal prompt | Completed | Shreya Saraf |
| 6. Replay and Record | 6.1 | TestReplay | test\_record\_playback | Verify record and playback functionality with navigation | Completed | Mannava Vignesh |
| 7. Save Game and Restart | 7.1 | TestGameSaveLoad | test\_save\_load\_game | Verify game state is saved and loaded accurately | Completed | Mannava Vignesh |

Summary of manual test cases (directly corresponding to some acceptance criteria)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User Story ID and Name** | **Acceptance Criterion ID** | **Test Case Input** | **Test Oracle (Expected Output)** | **Status** | **Notes** | **Developer Name(s)** |
| 1. Board Visualization | 1.1 | Launch the game GUI | Board displays all 24 positions in an organized layout | Completed | Visual inspection | Mannava Vignesh |
| 2. Piece Placement | 2.1 | Player W places at position 0 | Piece appears, turn switches to Player B | Completed | Visual inspection | Shaik Sumayya Fathima |
| 3. Invalid Move Handling | 3.1 | Attempt to place at occupied position | Error message displayed, move rejected | Completed | Error handling verification | Shaik Sumayya Fathima |
| 5. Mill Formation Detection | 5.1 | Player forms a mill at positions 0, 1, 2 | Mill detected, prompt to remove opponent’s piece | Completed | Mill detection confirmation | Mannava Vignesh |
| 6. Replay and Record | 6.1 | Press record, perform moves, then replay | Moves replayed with step controls | Completed | Functional replay check | Shaik Sumayya Fathima |

Summary of other automated or manual tests (not corresponding to the acceptance criteria)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Number** | **Test Input** | **Expected Result** | **Class Name of the Test Code** | **Method Name of the Test Code** | **Status** | **Developer Name(s)** |
| 1 | Place pieces sequentially until limit | Players cannot place more than 9 pieces | N/A | N/A | Completed | Shaik Sumayya Fathima, Shreya Saraf |
| 2 | Attempt to place piece outside board | Error message displayed | N/A | N/A | Completed | Shaik Sumayya Fathima, Shreya Saraf |

1. **Summary of Source Code**

|  |  |  |  |
| --- | --- | --- | --- |
| Production or test code | Source code file name | # lines of code | Developer names and contributions (% of the source code) |
| Production Code | ai.py | 18 | Mannava Jyothi Krishna (60%), Mannava Vignesh (40%) |
| Production Code | game\_logic.py | 186 | Mannava Jyothi Krishna (40%), Mannava Vignesh (60%) |
| Production Code | Gui.py | 440 | Shreya Saraf |
| Production Code | Main.py | 44 | Shaik Sumayya Fathima (50%), Shreya Saraf (50%) |
| Production Code | Utils.py | 102 | Mannava Jyothi Krishna (25%), Shreya Saraf (40%), Mannava Vignesh (25%) |
| Test Code | Test\_game.py | 213 | Shaik Sumayya Fathima (50%), Shreya Saraf (50%) |
| Total | | 1003 |  |

1. **Meeting Minutes (only during this sprint)**

Report the minutes of all meetings, including, but not limited to: project/sprint planning meeting, stand-up meeting, backlog grooming, retrospective meeting, and pair programming session.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date** | **Time and Duration** | **Place** | **Participant Names** | **Purpose of the Meeting** | **Specific Action Items** |
| 10/8/24 | 10:00 AM - 11:00 AM | Zoom | All team members | Define sprint objectives and assign user stories | Define sprint objectives and assign user stories |
| 10/12/24 | 9:00 AM - 11:15 AM | Zoom | All team members | Daily progress update | Daily progress update |
| 10/15/24 | 2:00 PM - 3:00 PM | Zoom | All team members | Refine user stories and prioritize tasks | Refine user stories and prioritize tasks |
| 10/20/24 | 4:00 PM - 5:00 PM | Zoom | All team members | Review sprint outcomes, identify improvements | Review sprint outcomes, identify improvements |
| 11/1/2024 | 1:00 PM - 3:00 PM | Zoom | All team members | Integration of game logic with GUI and fixing all of the bugs | Integration of game logic with GUI |

1. **Buddy Ratings**

If you don’t feel comfortable to include your ratings in this report, you may email your ratings to the instructor or grader.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Rating giver* | *Rating receiver* | | | | |
|  | Full Name 1 | Full Name 2 | Full Name 3 | Full Name 4 |
| Mannava Jyothi Krishna | X | 1 | 1 | 1 |
| Mannava Vignesh | 1 | X | 1 | 1 |
| Shaik Sumayya Fathima | 1 | 1 | X | 1 |
| Shreya Saraf | 1 | 1 | 1 | X |
|  | *Average* | 1 | 1 | 1 | 1 |

**VII. Summary**

* **Mannava Jyothi Krishna** focused on developing the core game logic for both human players, implementing the primary phases of placing and moving pieces, as well as essential mill formation and piece removal functionalities. Additionally, Krishna led efforts to implement phase-specific movement rules, particularly the flying phase for players reduced to three pieces, ensuring rule-based gameplay transitions.
* **Mannava Vignesh** took charge of designing and implementing the graphical user interface (GUI), creating a visually organized board and intuitive piece interaction mechanisms. Vignesh also integrated features for saving and loading game states, providing users with continuity and flexibility in gameplay, as well as enhancing the user experience by updating the status display according to the game's phase.
* **Shaik Sumayya Fathima** contributed significantly to automated testing, creating test cases to validate piece placement, turn switching, and mill detection. Additionally, Sumayya assisted with refining the GUI, ensuring that piece interactions were responsive and aligned with the intended game logic, and collaborated on implementing a recording and replay feature for game moves.
* **Shreya Saraf** managed project integration and documentation, ensuring that each part of the codebase functioned cohesively. Shreya also contributed to the game’s logic, particularly in supporting the AI's minimax decision-making with alpha-beta pruning, optimizing AI responses, and implementing test cases for the AI’s movement strategies and mill detection.