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COS 161, Spring 2022, Prof. Andrew Morelli
Project 04

Two (2) methods of your choice that you believe are most critical to your project.

playGame()

```
public static int playGame(Player p, Player opponent) {
    // Must use recursion to run the game
    // Allow for at 2 players, and alternate turns guessing
    char target = ' ';
    boolean validMove = false;
    boolean shipHit = false;
    String square = "";
    while (!validMove || shipHit) {
        // The base case should be all a player's ships being destroyed
        if (checkWinner(opponent, 0)) {
            return p.getPlayer();
        } else {
            // The recursive case should be a player taking their turn
            System.out.print("Player " + p.getPlayer() + " - Choose your target: ");
            Scanner scan = new Scanner(System.in);
            square = scan.next().toUpperCase();
            validMove = validMove(opponent, square);
            if (validMove) {
                target = checkTarget(opponent, square);
                if (target == 'H') {
                    shipHit = true;
                } else {
                    shipHit = false;
                }
                opponent.board.put(square, target);
                drawBoard(opponent);
            }
        }
    }
    // Update board & pass turn to next player
    return playGame(opponent, p);
}
```

drawGrid()

```
public static void drawGrid(Player p) {
    int r, c, y = 0;
    Color sColor;
    if (p.getPlayer() == 1) y = 50;
    else if (p.getPlayer() == 2) y = 330;
    Iterator<String> itr = p.board.keySet().iterator();
    while (itr.hasNext()) {
        String square = itr.next();
        // Convert row and column
        r = rowNum(square);
        c = colNum(square);
        // Set color based on status
    }
}
```

```
        if (p.board.get(square).equals('E')) sColor = cWATER;           // Empty
        else if (p.board.get(square).equals('S')) sColor = cWATER;       // Hidden ship
        else if (p.board.get(square).equals('H')) sColor = cHIT;         // Hit
        else if (p.board.get(square).equals('M')) sColor = cMISS;        // Miss
        else if (p.board.get(square).equals('X')) sColor = cSHIP;        // Placing ships
        else sColor = Color.white;
        // Draw grid
        g.setColor(sColor);
        g.fillRect(25 + GRID_SIZE*c, y + GRID_SIZE*r, GRID_SIZE, GRID_SIZE);
        g.setColor(Color.BLACK);
        g.drawRect(25 + GRID_SIZE*c, y + GRID_SIZE*r, GRID_SIZE, GRID_SIZE);
    }
}
```

At least three screenshots of console input of game being played.

At least four screenshots of the game board DrawingPanel.

```
Console X Ship.java Player.java
Battleship2 [Java Application] C:\Program Files\Amazon Corretto\jdk11.0.14_9\bin\javaw.exe (Ap
LET'S PLAY BATTLESHIP!

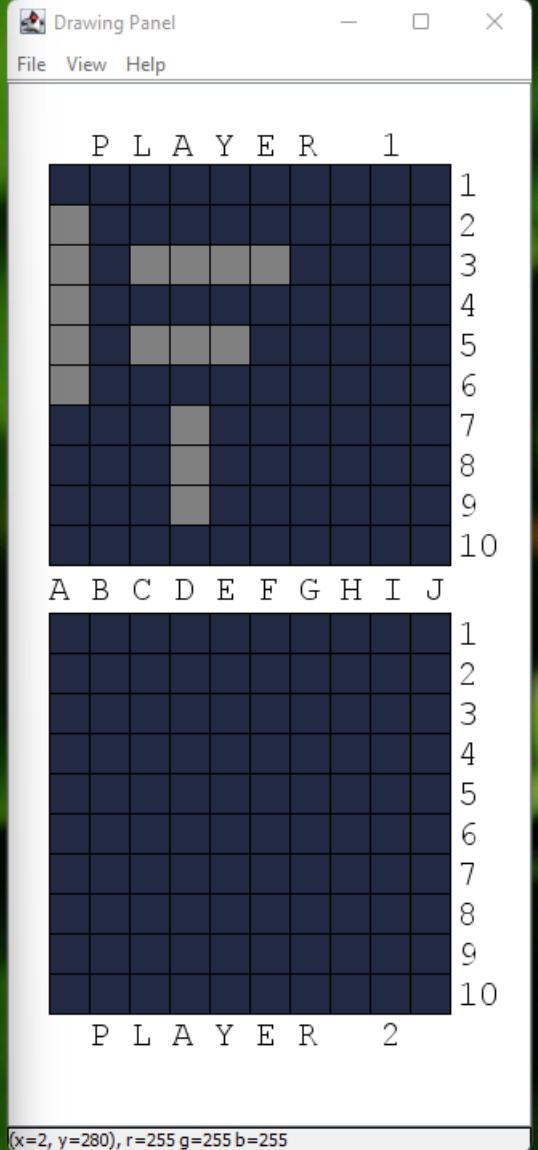
Player 1
Ship: Carrier (size 5)
Where would you like to place your Carrier?
Enter a letter (A-J) and a number (1-10): a2
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Carrier has been placed vertically on A2.

Player 1
Ship: Battleship (size 4)
Where would you like to place your Battleship?
Enter a letter (A-J) and a number (1-10): c3
How would you like to place the ship?
Enter V for vertical or H for horizontal: h
Your Battleship has been placed horizontally on C3.

Player 1
Ship: Destroyer (size 3)
Where would you like to place your Destroyer?
Enter a letter (A-J) and a number (1-10): d7
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Destroyer has been placed vertically on D7.

Player 1
Ship: Submarine (size 3)
Where would you like to place your Submarine?
Enter a letter (A-J) and a number (1-10): c5
How would you like to place the ship?
Enter V for vertical or H for horizontal: h
Your Submarine has been placed horizontally on C5.

Player 1
Ship: Patrol Boat (size 3)
Where would you like to place your Patrol Boat?
Enter a letter (A-J) and a number (1-10): h9
How would you like to place the ship?
Enter V for vertical or H for horizontal: h
```



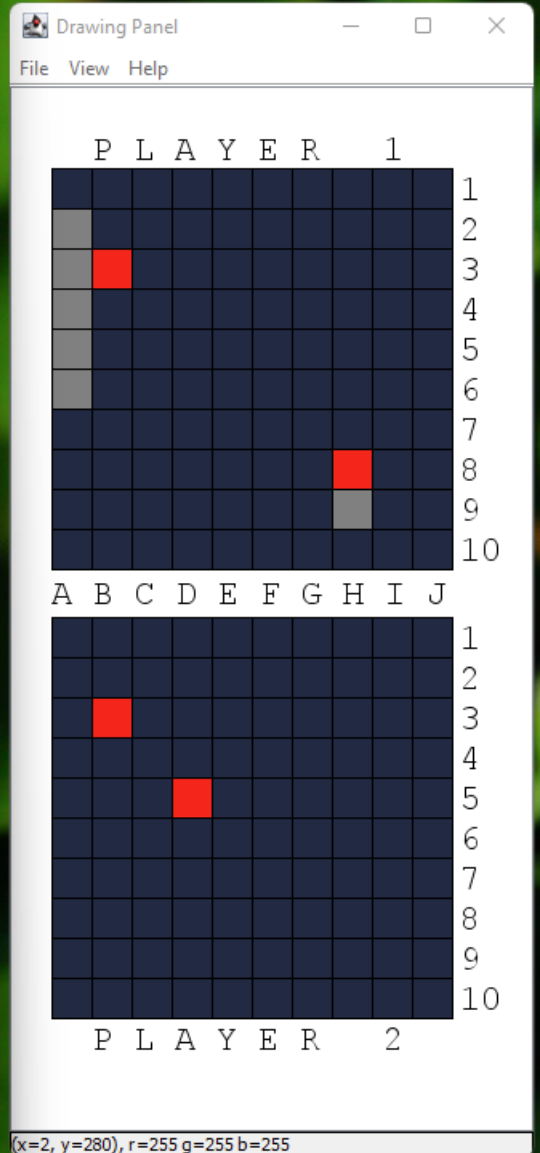
```
Console x Ship.java Player.java
Battleship2 [Java Application] C:\Program Files\Amazon Corretto\jdk11.0.14_9\bin\javaw.exe (Ap
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Battleship has been placed vertically on J3.

Player 2
Ship: Destroyer (size 3)
Where would you like to place your Destroyer?
Enter a letter (A-J) and a number (1-10): c2
How would you like to place the ship?
Enter V for vertical or H for horizontal: h
Your Destroyer has been placed horizontally on C2.

Player 2
Ship: Submarine (size 3)
Where would you like to place your Submarine?
Enter a letter (A-J) and a number (1-10): f5
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Submarine has been placed vertically on F5.

Player 2
Ship: Patrol Boat (size 3)
Where would you like to place your Patrol Boat?
Enter a letter (A-J) and a number (1-10): b7
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Patrol Boat has been placed vertically on B7.

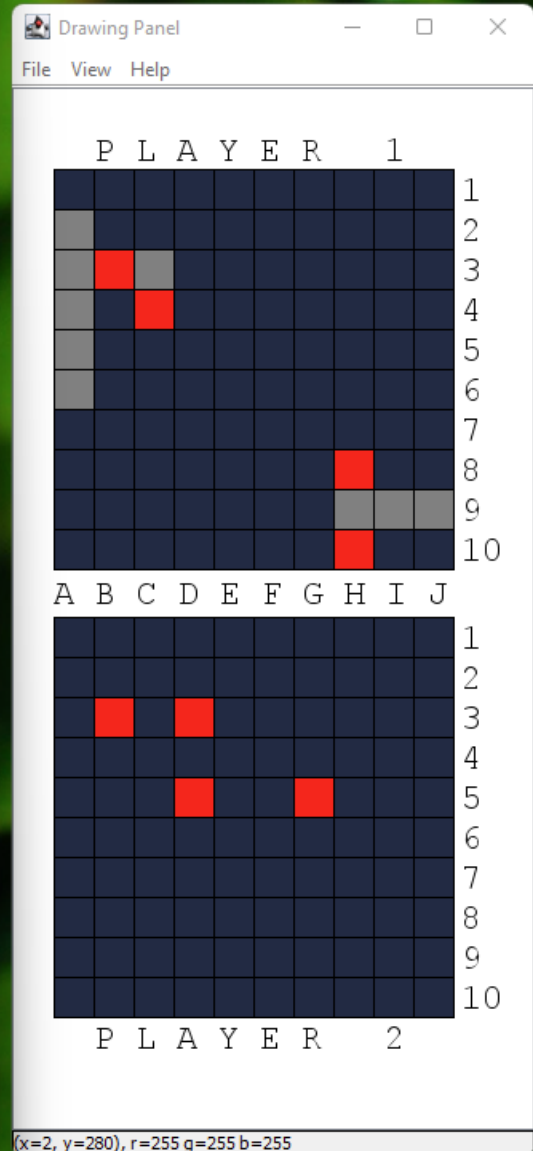
Player 1 - Choose your target: d5
Miss!
Player 2 - Choose your target: h9
Hit!
Player 2 - Choose your target: h8
Miss!
Player 1 - Choose your target: b3
Miss!
Player 2 - Choose your target: a2
Hit!
Player 2 - Choose your target: a3
Hit!
Player 2 - Choose your target: a4
Hit!
Player 2 - Choose your target: a5
Hit!
Player 2 - Choose your target: a6
You sunk Player 1's Carrier!
Player 2 - Choose your target: b3
Miss!
Player 1 - Choose your target:
```



```
Console X Ship.java Player.java
Battleship2 [Java Application] C:\Program Files\Amazon Corretto\jdk11.0.14_9\bin\javaw.exe (Ap
Where would you like to place your Submarine?
Enter a letter (A-J) and a number (1-10): f5
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Submarine has been placed vertically on F5.

Player 2
Ship: Patrol Boat (size 3)
Where would you like to place your Patrol Boat?
Enter a letter (A-J) and a number (1-10): b7
How would you like to place the ship?
Enter V for vertical or H for horizontal: v
Your Patrol Boat has been placed vertically on B7.

Player 1 - Choose your target: d5
Miss!
Player 2 - Choose your target: h9
Hit!
Player 2 - Choose your target: h8
Miss!
Player 1 - Choose your target: b3
Miss!
Player 2 - Choose your target: a2
Hit!
Player 2 - Choose your target: a3
Hit!
Player 2 - Choose your target: a4
Hit!
Player 2 - Choose your target: a5
Hit!
Player 2 - Choose your target: a6
You sunk Player 1's Carrier!
Player 2 - Choose your target: b3
Miss!
Player 1 - Choose your target: g5
Miss!
Player 2 - Choose your target: h10
Miss!
Player 1 - Choose your target: d3
Miss!
Player 2 - Choose your target: i9
Hit!
Player 2 - Choose your target: j9
You sunk Player 1's Patrol Boat!
Player 2 - Choose your target: c3
Hit!
Player 2 - Choose your target: c4
Miss!
Player 1 - Choose your target: |
```



```
Console X Ship.java Player.java
Battleship2 [Java Application] C:\Program Files\Amazon Corretto\jdk11.0.14_9\bin\javaw.exe (Ap
Hit!
Player 2 - Choose your target: a3
Hit!
Player 2 - Choose your target: a4
Hit!
Player 2 - Choose your target: a5
Hit!
Player 2 - Choose your target: a6
You sunk Player 1's Carrier!
Player 2 - Choose your target: b3
Miss!
Player 1 - Choose your target: g5
Miss!
Player 2 - Choose your target: h10
Miss!
Player 1 - Choose your target: d3
Miss!
Player 2 - Choose your target: i9
Hit!
Player 2 - Choose your target: j9
You sunk Player 1's Patrol Boat!
Player 2 - Choose your target: c3
Hit!
Player 2 - Choose your target: c4
Miss!
Player 1 - Choose your target: e4
Miss!
Player 2 - Choose your target: d3
Hit!
Player 2 - Choose your target: e3
Hit!
Player 2 - Choose your target: f3
You sunk Player 1's Battleship!
Player 2 - Choose your target: c5
Hit!
Player 2 - Choose your target: d5
Hit!
Player 2 - Choose your target: e5
You sunk Player 1's Submarine!
Player 2 - Choose your target: d7
Hit!
Player 2 - Choose your target: d8
Hit!
Player 2 - Choose your target: d9
You sunk Player 1's Destroyer!

GAME OVER!
Player 2 wins!
```

