

Code Explanation

1. Get grid size and number of mines from the user:

- Use `Scanner` to read the grid size and number of mines.
- Validate that the number of mines does not exceed 35% of the total grid squares. If it does, print "Number of mines exceeds the allowed limit" and stop the program.
- Otherwise, set `gameOver` to `false`.

2. Initialize the grid:

- Define the grid, mines, and revealed arrays based on the size of the grid.
- In the `initializeGrid()` method, fill the grid with underscores ('_').

3. Place mines randomly:

- Define the `placeMines()` method. Start with `minesPlaced = 0`.
- Randomly select a row and column, and place a mine there. Repeat this until you place the required number of mines.

4. Display the grid and revealed cells:

- In the `isGameOver()` loop, display the grid with appropriate labels and revealed cells.

5. User input for revealing cells:

- Use `Scanner.next()` to get input for selecting a square to reveal.
- Validate the user input:
 1. If the input length is less than 2, print "Invalid input. Try again."
 2. If the row or column is out of bounds (less than 0 or greater than size), print "Invalid square. Try again."
 3. If the square is already revealed, print "Square already revealed. Try again."
 4. If the square contains a mine, print "Oh no, you detonated a mine! Game over" and set `gameOver = true`.
 5. Otherwise, reveal the square using the `revealSquare()` method and check adjacent cells for mines using the `countAdjacentMines()` method.

6. Count adjacent mines:

- The `countAdjacentMines()` method checks all 8 neighboring cells (left, right, top, bottom, and diagonals) to count the mines. If a cell has no adjacent mines (`count == 0`), recursively call `revealSquare()`

7. Repeat until the game is over.

Testing

Output 1

```
Welcome to Minesweeper!
Enter the size of the grid (e.g., 4 for a 4x4 grid): 3
Enter the number of mines to place on the grid (maximum is 35% of the total squares): 1
  1 2 3
A _ _ _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): A1
  1 2 3
A 1 _ _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): A2
  1 2 3 |
A 1 1 _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): A3
  1 2 3
A 1 1 1
```

```
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): C1
  1 2 3
A 1 1 1
B _ _ _
C 1 _ _
Select a square to reveal (e.g., A1): C2
  1 2 3
A 1 1 1
B _ _ _
C 1 1 _
Select a square to reveal (e.g., A1): C3
  1 2 3
A 1 1 1
B _ _ _
C 1 1 1
Select a square to reveal (e.g., A1): B1
  1 2 3
A 1 1 1
B 1
```

```
C 1 1 1
Select a square to reveal (e.g., A1): B3
  1 2 3
A 1 1 1
B 1 _ 1
C 1 1 1
Congratulations, you have won the game!

Process finished with exit code 0
```

Output 2

```
Welcome to Minesweeper!
Enter the size of the grid (e.g., 4 for a 4x4 grid): 3
Enter the number of mines to place on the grid (maximum is 35% of the total squares): 13
Number of mines exceeds the allowed limit.

Process finished with exit code 0
```

Output 3

```
Welcome to Minesweeper!
Enter the size of the grid (e.g., 4 for a 4x4 grid): 3
Enter the number of mines to place on the grid (maximum is 35% of the total squares): 1
  1 2 3
A _ _ _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): A10
Invalid square. Try again.
  1 2 3
A _ _ _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): U1
Invalid square. Try again.
  1 2 3
A _ _ _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): |
```

Output 4

```
Welcome to Minesweeper!
Enter the size of the grid (e.g., 4 for a 4x4 grid): 3
Enter the number of mines to place on the grid (maximum is 35% of the total squares): 2
  1 2 3
A _ _ _
B _ _ _
C _ _ _
Select a square to reveal (e.g., A1): B2
  1 2 3
A _ _ _
B _ 2 _
C _ _ _
Select a square to reveal (e.g., A1): B1
  1 2 3
A _ _ _
B 1 2 _
C _ _ _
Select a square to reveal (e.g., A1): A1
  1 2 3
A 0 1
```

```
C _ _ _
Select a square to reveal (e.g., A1): B1
  1 2 3
A _ _ _
B 1 2 _
C _ _ _
Select a square to reveal (e.g., A1): A1
  1 2 3
A 0 1 _
B 1 2 _
C _ _ _
Select a square to reveal (e.g., A1): A3
  1 2 3
A 0 1 1
B 1 2 _
C _ _ _
Select a square to reveal (e.g., A1): B3
Oh no, you detonated a mine! Game over.

Process finished with exit code 0
```