UNIT TESTS FOR BATTLEBOAT OPEN SOURCE PROJECT

1. Test Grid Creation: Ensure the grid is created correctly and has the expected dimensions.

Example Test:

```
def test_create_grid():
    create_grid()
    assert len(GRID) == GRID_SIZE
    assert all(len(row) == GRID_SIZE for row in GRID)
```

2. Test Ship Placement: Verify that the ships are placed correctly on the grid

Example Test:

```
def test_ship_placement():
    create_grid()
    assert len(SHIP_POSITIONS) == NUM_OF_SHIPS
    for ship in SHIP_POSITIONS:
        start_row, end_row, start_col, end_col = ship
        assert all(grid[r][c] == "O" for r in range(start_row, end_row) for c in range(start_col,
end_col))
```

3. Test Bullet Shooting: Check if shooting bullets updates the grid correctly

Example Test:

```
def test_shoot_bullet():
    create_grid()
    row, col = 0, 0  # Assuming shooting at the top-left corner
    grid_before = [row[:] for row in GRID]
    shoot_bullet()
    if grid_before[row][col] == ".":
        assert GRID[row][col] == "#"  # Missed shot
    elif grid_before[row][col] == "O":
        assert GRID[row][col] == "X"  # Hit shot
```

4. Test Ship Sinking: Ensure that the game recognizes when a ship is sunk

Example Test:

```
def test_ship_sinking():
    create_grid()
    row, col = 0, 0  # Assuming shooting at the top-left corner where a ship is placed
    grid_before = [row[:] for row in GRID]
    shoot_bullet()  # Shooting at a ship
    if grid_before[row][col] == "O":  # If a ship part was hit
```

```
    assert NUM_OF_SHIPS_SUNK == 0  # No ships sunk yet
    shoot_bullet()  # Hit again
    assert NUM_OF_SHIPS_SUNK == 1  # Now one ship should be sunk
```

5. Test Game Over Condition: Verify that the game correctly ends when all ships are sunk or bullets are depleted

<u>Example Test:</u>

```
def test_game_over():
    create_grid()
    assert not GAME_OVER  # Game should not be over initially
    for _ in range(BULLETS_LEFT):
        shoot_bullet()
        if NUM_OF_SHIPS_SUNK == NUM_OF_SHIPS:
            assert GAME_OVER  # Game should be over when all ships are sunk
            break
    else:
        assert GAME_OVER  # Game should also be over when bullets are depleted
```