Optional (?) Test Case Exercise:

1. The solution must support missiles launched by the user
    - The solution must initiate a missile launch when the user clicks the right mouse button.
        - Precondition: Game is running
        - Action: Correct button is clicked by user
        - Postcondition: Missile launch initiation
    - The solution must initiate a missile launch when the user clicks the space bar.
        - Precondition: Game is running
        - Actions: Space bar pressed by user
        - Postcondition: Missile launch initiated
    - 1C) The solution must limit the number of active missiles on the screen to no more than five (5) at any given time. (an "active missile" is any missile currently being displayed on the screen)
        - Precondition: Game running, **there is no missiles on screen**
        - **Actions: User rapidly presses the space bar six times**
        - **Postcondition: Five missiles or less active and visible on screen, despite user attempting to launch six.**
    - 1D) The solution must remove the missile from being active if it goes off the screen.
        - Precondition: Missile active
        - Actions: Missile moves off screen
        - Postcondition: There are five missiles or less remaining that are active
    - **Extended test case for 1C and 1D: Ensure solution allows missile launches after existing missile leave screen view while maintaining a max of five active missiles at a time.**
        - **Precondition: Game running && user as fired five missiles rapidly**
        - **Action: User continues to press space bar repeatedly to launch more missiles && solution observes number of missiles on screen && solution waits for one missile to go off screen based on number of missiles on screen**
        - **Postcondition: No more than five missiles are visible at any given time. When first missile goes off screen, solution allows next missile to launch.**
    - The solution must maintain the same constant speed for all missiles
        - Precondition: Missile launch started
        - Actions: Missile moves upward
        - Postcondition: Missile's speed stays constant

- The solution must launch missiles from the center of the bottom of the screen when a launch is initiated
    - Precondition: Launch initiated
    - Actions: Missile created
    - Postcondition: Missile appears at the center bottom of the screen when launch is initiated
- The solution must maintain the same constant direction for all missiles to be vertically straight up from the launched position.
    - Precondition: Missile launched
    - Actions: Missile moves upward
    - Postcondition: Missile moves vertically
- The solution must detect when a missile “hits” a ship
    - Precondition: Missile & ship are active
    - Actions: Missile collides w/ ship
    - Postcondition: Hit detected
- The solution must display an explosion at the point where a missile “hits” a ship
    - Precondition: Missile “hits” ship
    - Actions: Explosion triggered by missile “hitting” ship
    - Postcondition: Explosion displayed at point of explosion
- The solution must remove the missile and ship after the missile “hits” the ship
    - Precondition: Missile hits ship
    - Actions: Ship & missile “removed”
    - Postcondition: Ship & missile “removal” confirmed
- The solution must keep a count of all “hits”
    - Precondition: Solution is running, hit(s) detected
    - Actions: Hit(s) recorded
    - Postcondition: Total hit count updated

2. The solution must support ships launched by the solution
    - The solution must initiate a ship launch when the system detects there are no active ships.
        - Precondition: No active ships detected
        - Action: System triggers ship launch
        - Postcondition: New ship launched
    - The solution must support multiple types of ships based on a configurable value.

        - Precondition: Configurable ship types available
        - Action: Solution determines ship type
        - Postcondition: Correct ship type launched
- The solution must display the appropriate image based on the type of ship when the ship is active
    - Precondition: Ship type determined & ship active
    - Action: Appropriate image selectted
    - Postcondition: Appropriate ship image displayed
- The solution must randomly initiate a ship launch based on a configurable rate where the default is 30% of the time
    - The solution must randomly choose from available ship types when a launch is initiated, giving all types of equal chance of being launched.
        - Precondition: Ship type decided & rate set
        - Action: Random percentage calculated
        - Postcondition: Ship launches 30% of time
    - The solution must limit the number of active ships on the screen to no more than ten (10) at any given time. (an “active ship” is any ship currently being displayed on the screen)
        - Precondition: Ship count less than or equal to ten, ships active
        - Action: System starts new ship launch
        - Postcondition: No more the 10 ships active (less than or equal to 10)
    - The solution must randomly choose a location to launch a ship from when initiated
        - The system must randomly choose to launch the ship from the left side of the screen or the right side of the screen
            - Precondition: Ship launch started
            - Action: “Random” side (left/right) selected
            - Postcondition: Ship launched from randomly selected side
        - The system must randomly choose a row in the top two-thirds of the screen to launch the ship from
            - Precondition: Ship launch started
            - Action: Random row in top 2/3rds selected
            - Postcondition: Ship launched from chosen row
- The system must assign the speed of the ship based on the type of the ship being initiated
    - Precondition: Ship type decided

    - Action: Speed assigned based on ship type
    - Postcondition: Ship moved at assigned speed

3. The system must assign the direction of the ship based on which side of the screen it is being launched from (if from the left, direction goes left to right; if from the right, direction goes right to left)
    - Precondition: Side selected && ship launch started
    - Action: Direction selected and assigned based on side (left/right)
    - Postcondition: Ship move in correct direction (left > right / right > left)
4. The solution must remove the ship from being active if it goes off the screen.
    - Precondition: Ship active
    - Action: Ship moves off screen
    - Postcondition: Ship removed (deactivated)
5. The solution must end the game when the user clicks the *escape* button
    - Precondition: Game running
    - Action: User presses escape button
    - Postcondition: Game ends
6. The solution must end the game if the user has not initiated a missile launch in the last 5 minutes.
    - Precondition: Game running && timer active
    - Action: Five minutes elapse w/o missile launch
    - Postcondition: Game ends as a direct result of inactivity