Team No Name
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1. The solution must support missiles launched by the user

    a. The solution must initiate a missile launch when the user clicks the right mouse button.
        i. Positive
            1. Precondition: 0 missiles
            2. Action: User clicks right mouse button
            3. Postcondition: Initiates a missile
        ii. Negative
            1. Precondition: No missiles
            2. Action: User does not click right mouse button
            3. Postcondition: No missiles
    b. The solution must initiate a missile launch when the user clicks the space bar.
        i. Positive
            1. Precondition: 0 missiles
            2. Action: User presses space bar
            3. Postcondition: Initiates a missile
        ii. Negative
            1. Precondition: 0 missiles
            2. Action: User does not space bar
            3. Postcondition: 0 missiles

    c. 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)
        i. Positive
            1. Precondition: There are 5 active missiles
            2. Action: Right mouse click or space bar
            3. Postcondition: There are only 5 active missiles
        ii. Negative
            1. Precondition: There are 5 active missiles
            2. Action: No Right mouse click or space bar
            3. Postcondition: There are 5 active missiles

    d. The solution must remove the missile from being active if it goes off the screen.
        i. Positive:
            1. Precondition: Missile reaching the end of the screen
            2. Action: Missile goes off screen
            3. Postcondition: Missile becomes inactive
        ii. Negative:
            1. Precondition: Missile reaching the end of the screen

2. Action: Missile does not go off screen
3. Postcondition: Missile remains active

e. The solution must maintain the same constant speed for all missiles
    i. Positive
        1. Precondition: Active missile
        2. Action: Game in progress
        3. Postcondition: Missile speed remains constant

f. The solution must launch missiles from the center of the bottom of the screen when a launch is initiated
    i. Positive:
        1. Precondition: Missiles are inactive
        2. Action: Missile is initiated
        3. Postcondition: Launch from center or bottom of screen.
    ii. Negative:
        1. Precondition: Missiles are inactive
        2. Action: Missile is not initiated
        3. Postcondition: Missile does not launch

g. The solution must maintain the same constant direction for all missiles to be vertically straight up from the launched position.
    i. Positive:
        1. Precondition: Active missile
        2. Action: Observe
        3. Postcondition: Missile continues in a straight line

h. The solution must detect when a missile “hits” a ship
    i. Positive:
        1. Precondition: Active missile and ship
        2. Action: Missile hits ship
        3. Postcondition: Collision detected
    ii. Negative:
        1. Precondition: Active missile and ship
        2. Action: Missile does not hit ship
        3. Postcondition: Collision is not detected

i. The solution must display an explosion at the point where a missile “hits” a ship
    i. Positive:
        1. Precondition: Missile hits ship
        2. Action: Hit detected
        3. Postcondition: Explosion
    ii. Negative:
        1. Precondition: Missile hits ship

2. Action: Hit not detected
3. Postcondition: No explosion

j. The solution must remove the missile and ship after the missile “hits” the ship
    i. Positive:
        1. Precondition: Missile hits ship
        2. Action: Hit detected
        3. Postcondition: Missile and Ship disappear
    ii. Negative:
        1. Precondition: Missile hits ship
        2. Action: Hit not detected
        3. Postcondition: Missile and Ship do not disappear

k. The solution must keep a count of all “hits”

    Positive -
    Precondition: There is an active ship and missile. The hit counter is set to a value.
    Action: The missile hits the ship
    Postcondition: The hit counter was incremented by 1

    Negative -
    Precondition: There is an active ship and missile. The hit counter is set to a value.
    Action: The missile does not hit the ship
    Postcondition: The hit counter was not incremented by 1

2. The solution must support ships launched by the solution

    a. The solution must initiate a ship launch when the system detects there are no active ships.

        Precondition: No active ships in game
        Action: Ship launch initiated by solution
        Postcondition: There is an active ship in game

        Precondition: There is an active ship
        Action: The system detects there is an active ship and does nothing
        Postcondition: There is still an active ship

    b. The solution must support multiple types of ships based on a configurable value.

        Positive -
        Precondition: One ship is active

Action: Create ship with valid value
Postcondition: Two ships are active
Note: This test case should be repeated for up to 10 ships with a precondition of n-1 ships and a post condition of n ships.

Negative -
Precondition: One ship is active
Action: Create ship with invalid value
Postcondition: One ship is actve
Note: This test case should be repeated for up to 10 ships with a precondition and postcondition containing the same number of ships.

c. The solution must display the appropriate image based on the type of ship when the ship is active

   Positive -
   Precondition: There is an active ship
   Action: Observe the ship
   Postcondition: The ship is displaying the correct image for its configuration

d. The solution must randomly initiate a ship launch based on a configurable rate where the default is 30% of the time

   i. The solution must randomly choose from available ship types when a launch is initiated, giving all types equal chance of being launched.

      Positive -
      Precondition: Assuming 3 types of ships, game is running
      Action: a ship is launched at each interval correctly
      Postcondition: Each type of ship occurs ~= a third of the time.

   ii. 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)

      Positive -
      Precondition: there are 10 ships on the screen
      Action: interval for normal launch time occurs
      Postcondition: a ship is not launched

      Negative-
      Precondition: there are less than 10 ships on the screen
      Action: interval for normal launch time occurs
      Postcondition: a ship is launched

iii. The solution must randomly choose a location to launch a ship from when initiated

1. The system must randomly choose to launch the ship from the left side of the screen or the right side of the screen

2. The system must randomly choose a row in the top two-thirds of the screen to launch the ship from

3. The system must assign the speed of the ship based on the type of the ship being initiated

4. 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)

e. The solution must remove the ship from being active if it goes off the screen.

3. The solution must end the game when the “hit” count has reached ten (10)
   Positive -
   Precondition: hit count is initialized at zero and can only be modified in increments of +1 when player hits a ship. Game is running
   Action: Game begins and player hits 10 ships.
   Postcondition: game stops counting hits or any other score and starts end game screen.
   Note: No
4. The solution must end the game when the user clicks the left mouse button
   Positive -
   Precondition: Game is running
   Action: User clicks left mouse button
   Postcondition: Game ends

   Negative -
   Precondition: Game is not running
   Action: User clicks left mouse button
   Postcondition: system does not perform any action on status on the game.

   Negative -
   Precondition: Game is running
   Action: User does not click left mouse button
   Postcondition: system does not perform any action on status on the game.

5. The solution must end the game when the user clicks the esc button

    Positive -
    Precondition: Game is running
    Action: User clicks esc button
    Postcondition: Game ends

    Negative -
    Precondition: Game is not running
    Action: User clicks esc button
    Postcondition: system does not perform any action on status on the game.

    Negative -
    Precondition: Game is running
    Action: User does not click esc button
    Postcondition: system does not perform any action on status on the game.

6. The solution must end the game if the user has not initiated a missile launch in the last 5 minutes.

    Positive -
    Precondition: Game is running. Timer function is initialized to count down from 5 minutes
    Action:User does not initiate a missile launch and the game runs idly for 5 minutes
    Postcondition: Game ends

    Negative-
    Precondition: Game is running. Timer function is initialized to count down from 5 minutes
    Action: User fires a missile at any time within < 5 minute intervals, therefore restarting timer function before it reaches 0
    Postcondition: system does not perform any action on status on the game.

    Positive -
    Precondition:
    Action:
    Postcondition:

    Negative-
    Precondition:
    Action:
    Postcondition: