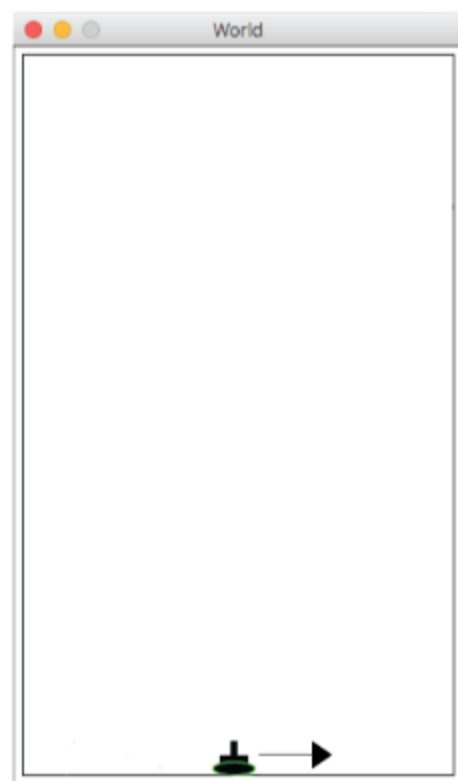
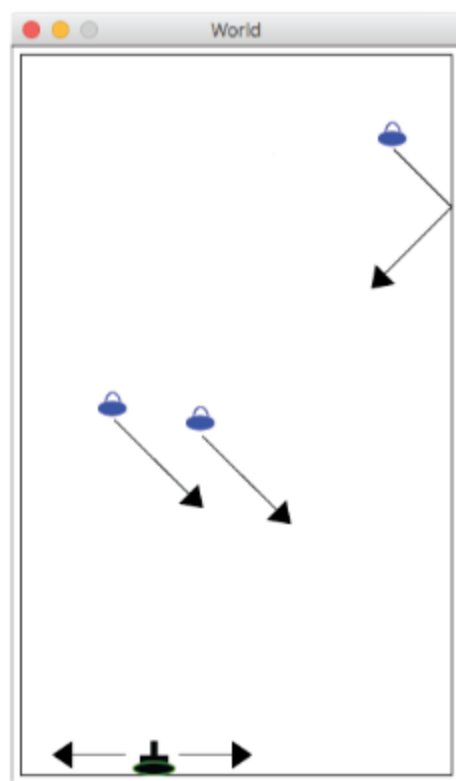


# Domain Analysis of the SpacInvaders Game

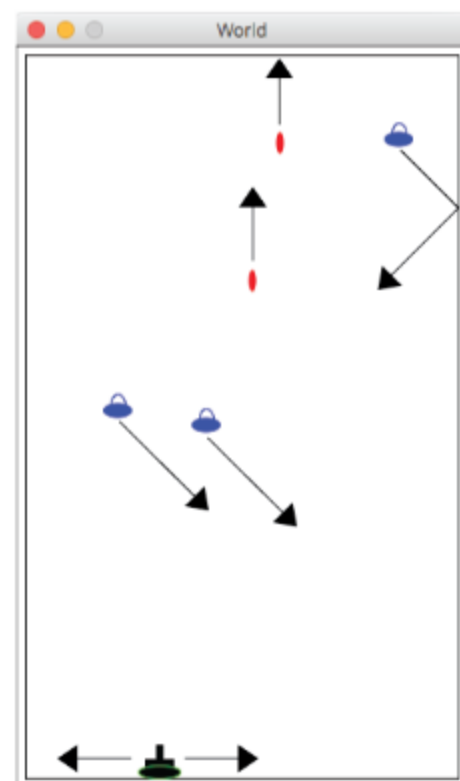
## 1. Program Scenarios



**Initial game state:** The game starts with the tank in the middle moving right.



**Tank with invaders:** Invaders enter the scene at a probabilistic rate and remain within the bounds of the canvas.



**Tank with invaders and missiles:** The player can fire missiles at the invaders. Missiles keep moving upward until they hit an invader or reach the top of the canvas. When a missile hits an invader, the invader disappears and the missile disappears.

**Game over:** When an invader reaches the bottom of the canvas, the game ends.

## Constants

- **WIDTH:** The width of the game screen.
- **HEIGHT:** The height of the game screen.
- **INVADER-X-SPEED:** The horizontal speed of an invader.
- **INVADER-Y-SPEED:** The vertical speed of an invader.
- **TANK-SPEED:** The speed of the player's tank.
- **MISSILE-SPEED:** The speed of a missile.
- **HIT-RANGE:** The effective range for a hit between a missile and an invader.
- **INVADE-RATE:** The rate at which invaders are added to the game.
- **BACKGROUND:** The background scene of the game.
- **INVADER:** The image of an invader.
- **INVADER-BOUNDARY-L/R:** The left/right boundary of the invader's movement.
- **TANK:** The image of the player's tank.
- **TANK-Y:** The vertical position of the tank.
- **TANK-BOUNDARY-L/R:** The left/right boundary of the tank's movement.
- **MISSILE:** The image of a missile.

## Changing Information

- **Invader:** Its position (x, y), and horizontal speed direction (dx).
- **Tank:** Its horizontal position (x) and direction (dir) - which can be -1 or 1 to represent left and right respectively.
- **Missile:** Its position (x, y).
- **Game:** The list of current invaders, missiles, and the current tank state.

## Big-Bang Options

- **on-tick:** Updates the game state as time goes by.
- **to-draw:** Renders the current game state.
- **on-key:** Changes the game state in response to key presses.
- **stop-when:** Stops the game when certain conditions are met.