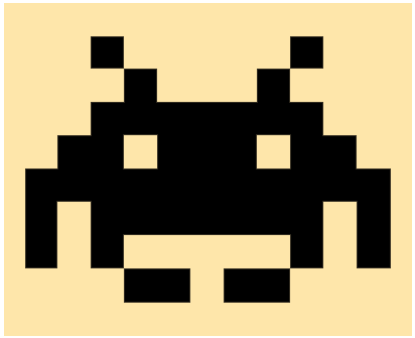
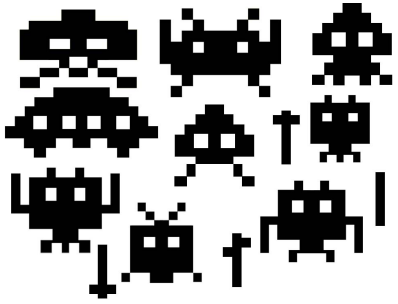
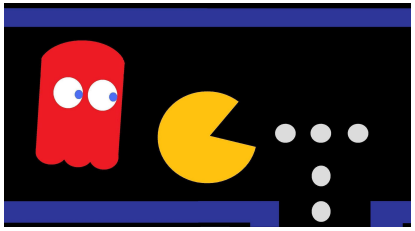
CSCI 1106
Lecture 05



Player Movement





Announcements

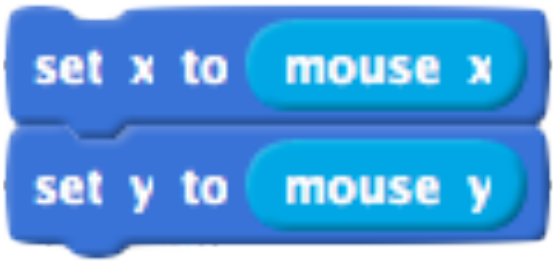
- Quiz is tomorrow in class
- Today's Topics
  - Finish Collision Detection
  - Motivation for player movement
  - Mouse Movement
  - Easing
  - Keyboard Movement

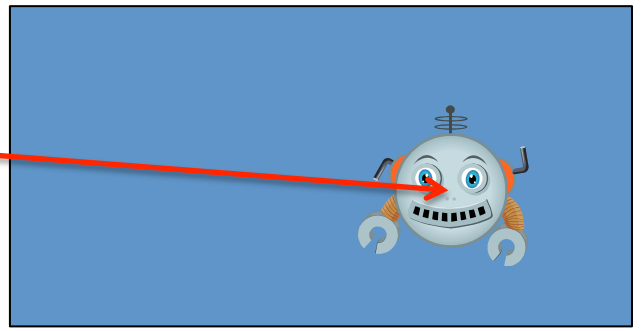
Player Motion

- All interactive games have player movement
  - Players can move their character or avatar on the screen
  - Players can react to the game and move their avatar
- How the avatar moves is dictated by the game's
  - Laws and physics of the game
  - Goals and objectives
  - Environment and level of play
- Common ways to move the avatar are through
  - Mouse
  - Keyboard
  - Dedicated game controllers and joysticks

Direct Mouse Movement

- Idea: Make the player the ”mouse”
  - The avatar appears where the mouse is pointing to
  - No need to control the velocity of the avatar
  - Position and velocity is managed by the mouse movement
- How:
  - Set the player sprite’s coordinates to the mouse coordinates at each FRAME event





Direct Mouse Movement

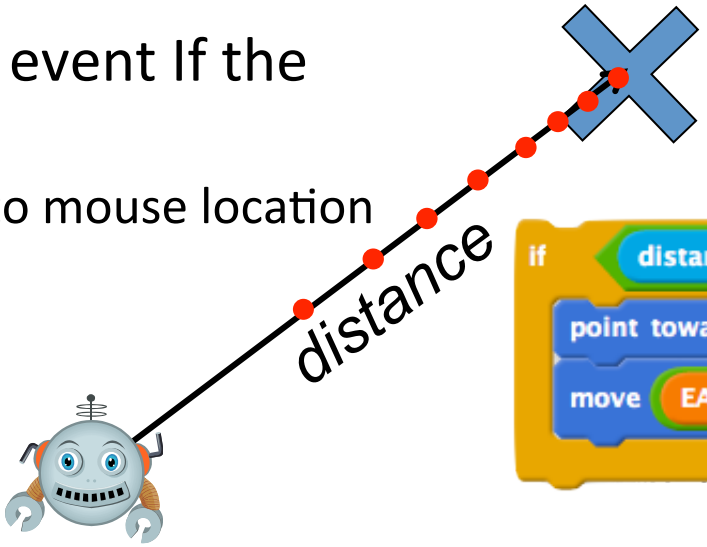
- Pros:
  - Easy
  - Not much code required
- Cons:
  - Restrictions on movement may be needed, e.g.,
    - Disallowing movement in some dimensions (paddle)
    - Checking if mouse is over the game panel area
  - Violates most accepted laws of physics
    - Avatar can accelerate and move instantly
- How can we solve these problems?

Mouse Movement using Easing

- Idea: gradually move avatar toward the location clicked on with the mouse pointer
  - A mouse click sets the target to move toward
  - Calculate distance between the avatar and target
  - Incrementally move the avatar toward the target
  - Note: the avatar isn't guaranteed to reach the target because the target will change if another location is clicked first
- Pros:
  - Makes the physics of the game more realistic
  - Restricts avatar movement by ignoring clicks on illegal areas of the stage
- Cons:
  - Allows only coarse-grained movement

Implementing Easing

- Declare an EASING constant
  - *0 < EASING < 1*
  - Smaller constant implies slower movement
- Create a transparent “Target” sprite
- Set *“Target" at* avatar’s location
- On each FRAME event If the mouse is down
  - Move“Target” to mouse location



- On each FRAME event
  - If avatar's distance to “Target" is greater than 1
    - point avatar at target
    - move avatar an EASING fraction of the distance to the target

Keyboard based Movement

- Idea: Move the player with the keyboard
  - The arrow keys control the direction that the avatar moves
  - These directions allow the player to move diagonally as well
  - Need to respond to the KEY PRESS events or check if keys are being pressed.
  - More than one key can be down at the same time
- Pros:
  - Very precise movement
- Con:
  - Requires the player to learn the control keys

Implementing Keyboard Controls

- On a FRAME event
  - Check which of the arrow keys are pressed and move in that direction