

Creating a Shmup in Game Maker

Foundations of Interactive Game Design
Professor Jim Whitehead
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Upcoming Events and Assignments

- **Game Concept Document**
 - ▶ Due Wednesday
 - ▶ More details in a few slides
 - ▶ Description, Template, Evaluation criteria all on website
- **Gamelog**
 - ▶ Due Friday
 - ▶ Game of your choice
- **Work Breakdown and Schedule**
 - ▶ Due next week, on Wednesday
- **Review Session**
 - ▶ Tonight! Here in Media Theater
 - ▶ 7:30PM start time
 - ▶ Bring your review materials!

RPG Maker/Game Maker/Art help

- **Wednesday:** RPG Maker design session
 - ▶ Led by Nate Emond <llama971@gmail.com>
 - ▶ 5:30PM, E2 215
 - ▶ Note different room for this week
- **Thursday:** Game Maker help/design session
 - ▶ Earth & Marine Sciences, room B214
 - ▶ 4-5:10PM
- **Want help with your game art?**
 - ▶ Jemima Thomas <luperis@yahoo.co.uk>
 - ❖ Took 80K last year
 - ❖ Created *excellent* sprites for her game
 - ❖ Is interested in working with a few teams to help them with game artwork
 - ❖ Contact her via email to make arrangements
- **Game Maker reduce cost license keys - see me**

Game Concept Document

- **Setting**

- ▶ You have 5 minutes with an executive at a game publisher
- ▶ Want them to provide you funding to develop your game

- **Goal**

- ▶ Write a *convincing* document that gives highlights of the game
- ▶ Must be *concise, punchy, to the point*
- ▶ Describe important aspects of
 - ❖ Gameplay - what does the player do?
 - ❖ Challenges - what are important challenges faced by the player?
 - ❖ Fictional setting - what is the background for the game's story?
 - ❖ Levels - briefly, what will the levels look like?
 - ❖ Art element - what is the artistic feel of the game?
 - ❖ Team - why are your team members the right ones for this project?
 - ❖ Audience - who is the audience for the game?

Game Concept Document Examples

- *On document camera, examples of game concept documents*

Creating a Shmup in Game Maker

- *Show brief demo of Gradius*
- Important mechanics
 - ▶ Steady movement through level
 - ▶ Sensation of movement
 - ▶ Spaceship cannot move offscreen
 - ▶ Spaceship fires and destroys enemies
 - ▶ Varied enemies
 - ▶ Powerups

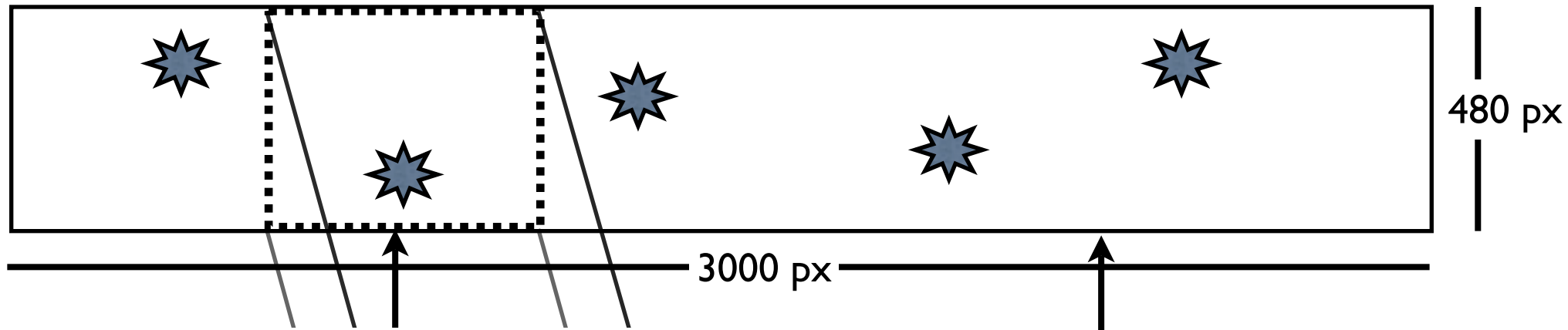
Backgrounds

- **Background**
 - ▶ Represents a static background image
 - ▶ Defined separately, then combined with a room
 - ▶ Can move, or be motionless
- **Many uses**
 - ▶ Moving starfield
 - ❖ Create starfield bitmap image
 - ❖ Define as background
 - ❖ Have it move backwards: creates sensation of motion
 - ▶ Reduce boundary objects
 - ❖ In tile-based games, need many tiles to create an interesting level
 - ❖ With objects, would need separate object for each tile type
 - Can slow a game down
 - ❖ Instead, create background image
 - ❖ Then, use *single, invisible* boundary object for collision detection

Rooms, Views, and Ports

- **Game window**
 - ▶ The window on screen that shows the game
 - ▶ 640 pixels wide x 480 pixels high by default in Game Maker
- **Room**
 - ▶ Defines a level
 - ▶ May be larger than the game window
- **View**
 - ▶ An interesting subset of a room
 - ▶ Often, but not always, the size of the game window
- **Port**
 - ▶ The dimensions of a view in the game window
- Views and ports are advanced Game Maker features
 - ▶ You *really* do want the Advanced version

Rooms, Views, and Ports Example



View (dotted line): Portion of room to make visible, usually portion of level visible to player

Room (solid line): Holds entire level (not all visible on screen at once)

Port (light solid lines): Mapping of View to Window. Usually 1 to 1, but doesn't have to be.

Window (heavy solid line): What the player is actually seeing

Radar scope effect from Defender:
map View to smaller area in Window.

Using Views in Shmup

- Desired behavior
 - ▶ View slowly moves through level at constant speed
 - ▶ Player must always be within the view
 - ❖ That is, player cannot move offscreen
 - ❖ Player is pushed along if they lag behind: must make forward progress
 - ▶ Player bullet can only destroy enemies that are onscreen
- Need to use **variables** and **conditionals** to make this happen
 - ▶ Uh, oh, sounds computer sciency
 - ▶ This is easy, really

Variables

- **Variable**
 - ▶ A **named value**
 - ▶ Can be **read**: look up the value
 - ▶ Can be **written**: change the value to something new
- **Examples**
 - ▶ The horizontal location of the player in the room is **named** “x”
 - ❖ Its **value** is a number between 0 and the width of the room
 - ❖ For the in-class demonstration, it varies between 0 and 3000
 - ▶ The vertical location of the player in the room is **named** “y”
 - ❖ Its **value** is a number between 0 and the height of the room
 - ❖ For the in-class demonstration, it varies between 0 and 640
 - ▶ Need names to identify the value we want

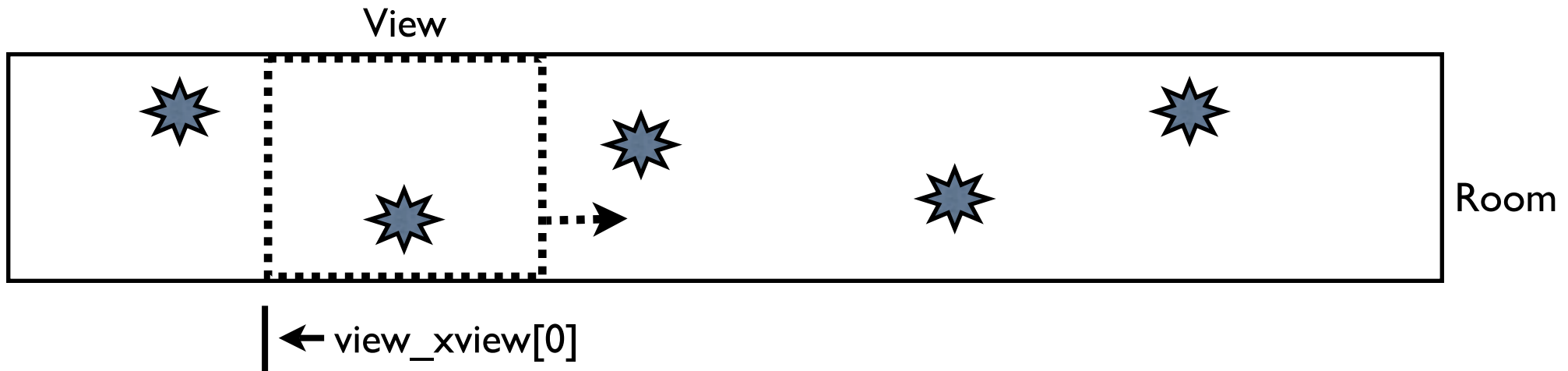
Variables (2)

- Full disclosure
 - ▶ There appear to be two kinds of variables
 - ▶ Variables defined on object instances
 - ❖ x and y giving player position are defined on the player object instance
 - ❖ Most of the dialog boxes in Game Maker default to instance variables, so don't have to worry about this point usually
 - ▶ Global variables
 - ❖ We'll see these in a few slides, things like view information
 - ❖ Seem to be able to access these anywhere
- In Game Maker
 - ▶ Can set the value of a variable using square "Var" action
 - ❖ Under "Control" tab in Object window
 - ❖ That is, *setting a variable is a kind of action*
 - Set a variable in response to an event

Conditionals

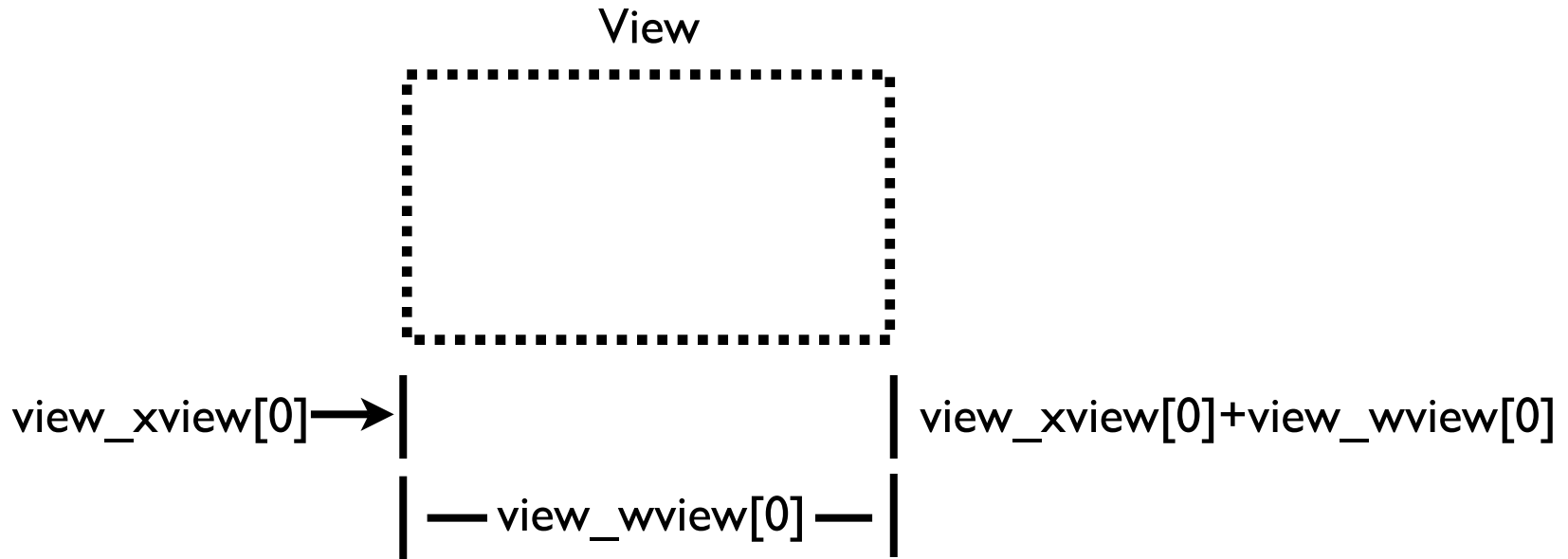
- If .. then behavior
- Example
 - ▶ **If** the player horizontal position is outside the view...
 - ▶ **Then** make sure the player stays inside the view
- Conditionals in Game Maker are represented by octagon shapes
 - ▶ Found under “Control” tab
 - ▶ Are an action you can take in response to an event
- Often want to check condition all the time
 - ▶ Place these in the step event
 - ▶ Step event is called every game tick (1/30th of a second)

Moving Through Level at Constant Speed



- Involves moving view slowly through room
- Approach
 - ▶ Every game tick, move left boundary of view forward by 2 pixels
 - ▶ Left boundary is held in variable *view_xview[0]*
 - ❖ Note that the 0 means View 0: would need to change for other views
 - ▶ So, put increment into Step Event for player object
 - ❖ “Set the value of a variable” - dark gray square box with “Var” in Control panel
 - ❖ Variable: *view_xview[0]*
 - ❖ Value: 2
 - ❖ Check “Relative” box - this means, add 2 to the current value

Keeping Player on Screen



- Need to check for player x less than left hand side
 - ▶ `view_xview[0]`
- Need to check for player x greater than right hand side
 - ▶ `view_xview[0]+view_wview[0]`
- Need to check for player y less than top
 - ▶ Less than 0
- Need to check for player y greater than bottom

Bullet Only Affects On Screen Enemies

- Need to check if the bullet has gone outside of the view
 - ▶ That is, is the bullet x greater than right side of view
 - ▶ Check for bullet x greater than `view_xview[0]+view_wview[0]`
- If bullet has gone too far
 - ▶ Destroy the bullet
 - ▶ If the bullet has been destroyed, cannot affect enemies

Paths

- An advanced feature
 - ▶ Have I mentioned you really want the advanced version?
- A predefined pathway enemies can follow
 - ▶ Pattern of movement of enemies in Shmup
 - ▶ Pattern of movement of enemies through a level in a Platformer
 - ❖ Think about barrels in Donkey Kong: always follow one of small set of paths
- To create
 - ▶ Add.. Add Path
 - ▶ Define set of points on the path
 - ▶ Can have different speeds at different points on path
- To make work
 - ▶ Connect with an object
 - ❖ In create event, use action to start path (on Move tab)
 - ▶ Can specify **repeating**/one-time, speed, **relative** or absolute coords