Level 4

Arcade Games

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Arcade games

Wikipedia:

The term "arcade game" is also used to refer to an action video game that was designed to play similarly to an arcade game with frantic, addictive gameplay. The focus of arcade action games is on the user's reflexes, and the games usually feature very little puzzle-solving, complex thinking, or strategy skills.

Single-screen games

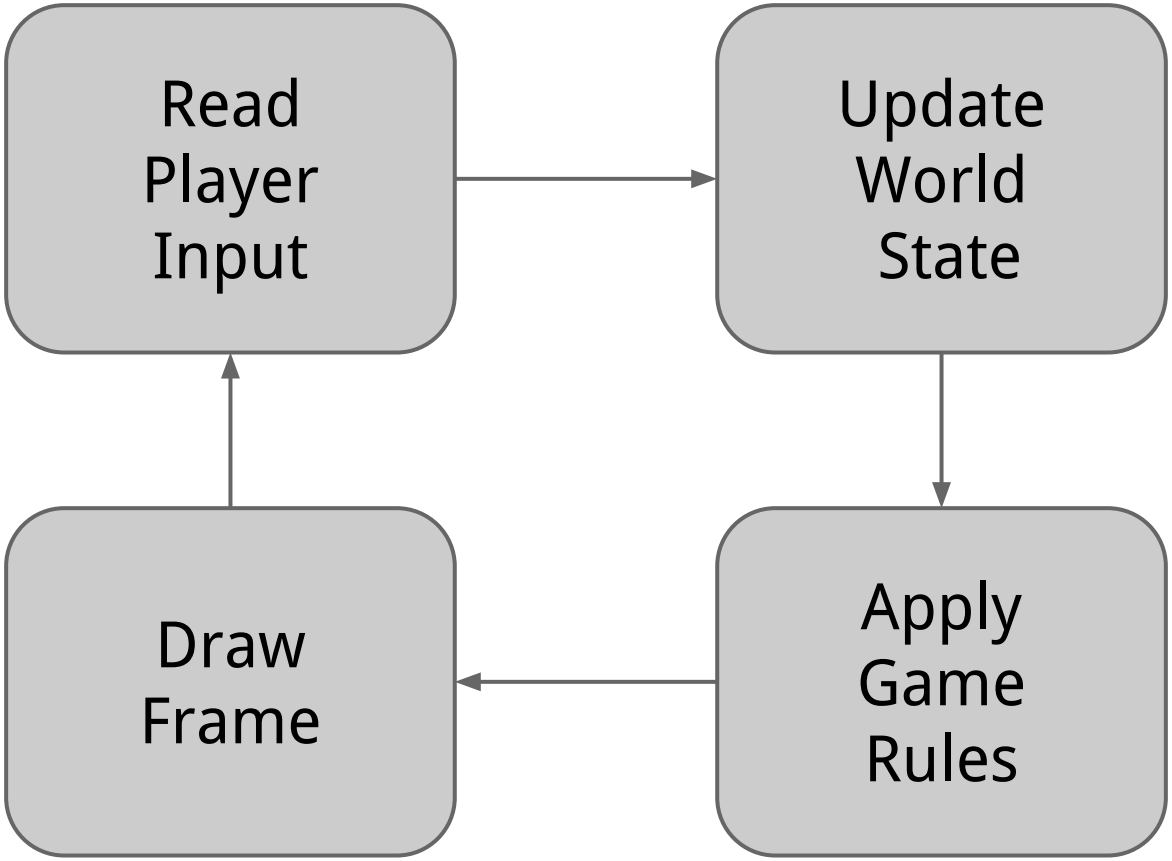
Gameplay takes place in a single-screen world

Versus:

Flip-screen split world across many screens
flip to new screen at edges

Side-scroller e.g. *Super Mario Bros*

So what's different?



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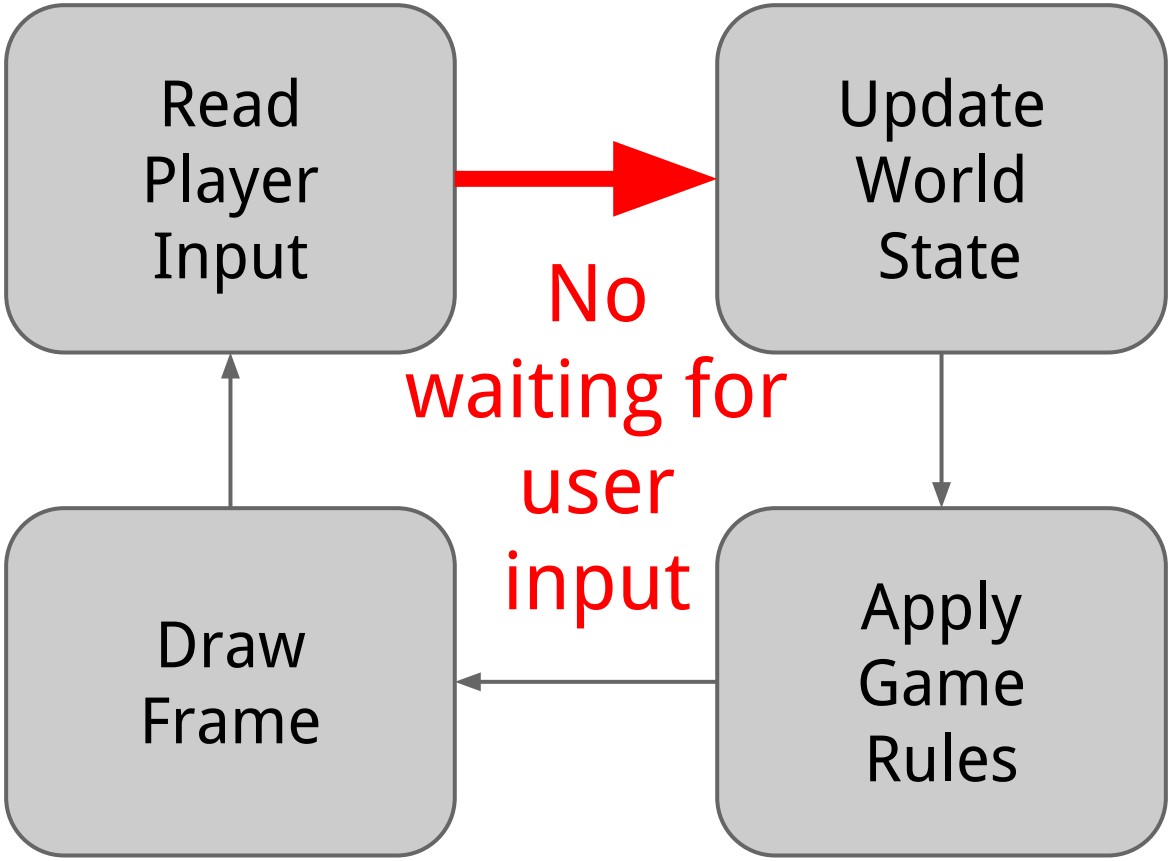

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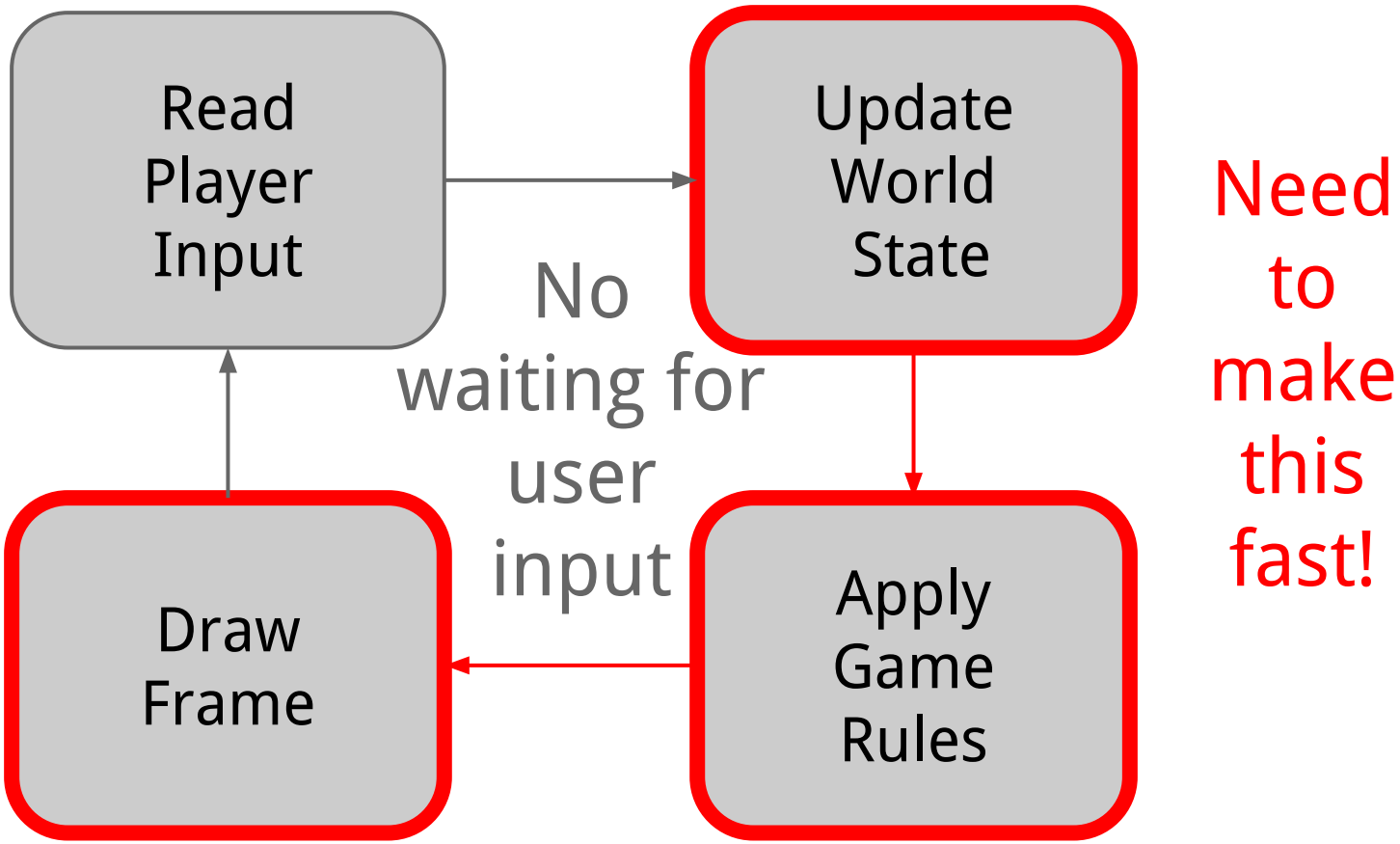


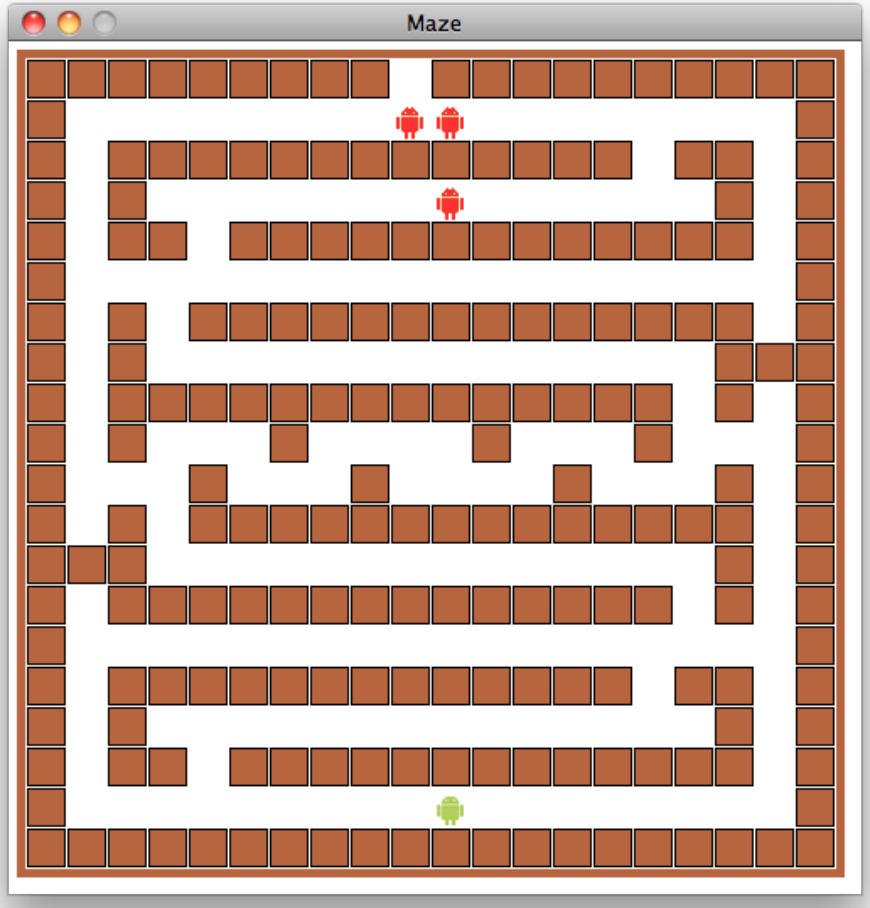
Trivial example: maze runner

Static maze

Cannot walk through walls

Baddies running around

Goal: get out



High-level structure

```
def main ():
    create window
    initialize level
    initialize player
    initialize baddies

    while not player at exit :
        check key pressed
        if move key, process player move
        baddies move
```

Representing a level

How to represent

- what to draw on the screen?
- where characters can be?

Solution 1:

- draw directly on the screen

Issue: determine where characters can go

require somewhat expensive check

Representing a level

How to represent

- what to draw on the screen?
- where characters can be?

Solution 2:

- **tiling**

A level is made up of different tiles

Tiles are one of a limited kind

Representing a level

How to rep

- what to
- where

Solution 2

- **tiling**

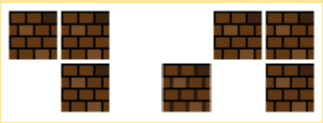
A level is r

Tiles are o

Tiling array:

1 1 0 0 1 1
0 1 0 1 0 1

Screen representation:



Character movements can be checked against tiling array

- not running into walls
- picking up static objects
- collision with baddies and others
- special locations (exit, …)

Representing characters

Question 1:

- do we represent characters in the tiling array or not?

Question 2:

- what behaviors do we expect from characters?

Question 3:

- what differentiates the player and baddies?

Representing characters

Question 1:

- do we represent characters in the tiling array or not?

Usually, no. Tiling array for static information.

Makes overlap of characters and underlying tiles more difficult to manage

Have characters know where they are and manage their own display accordingly

Representing characters

Question 2:

- what behaviors do we expect from characters?

(1) Move inside the tiling array
(2) Pick up things
  - how to recognize if over something?
    - if it's in the tiling array, easy
    - otherwise, maintain a list of things on the level and check whenever character moves
(3) Check collisions
  - only when moving?
  - method called every clock tick?

Representing characters

Question 3:

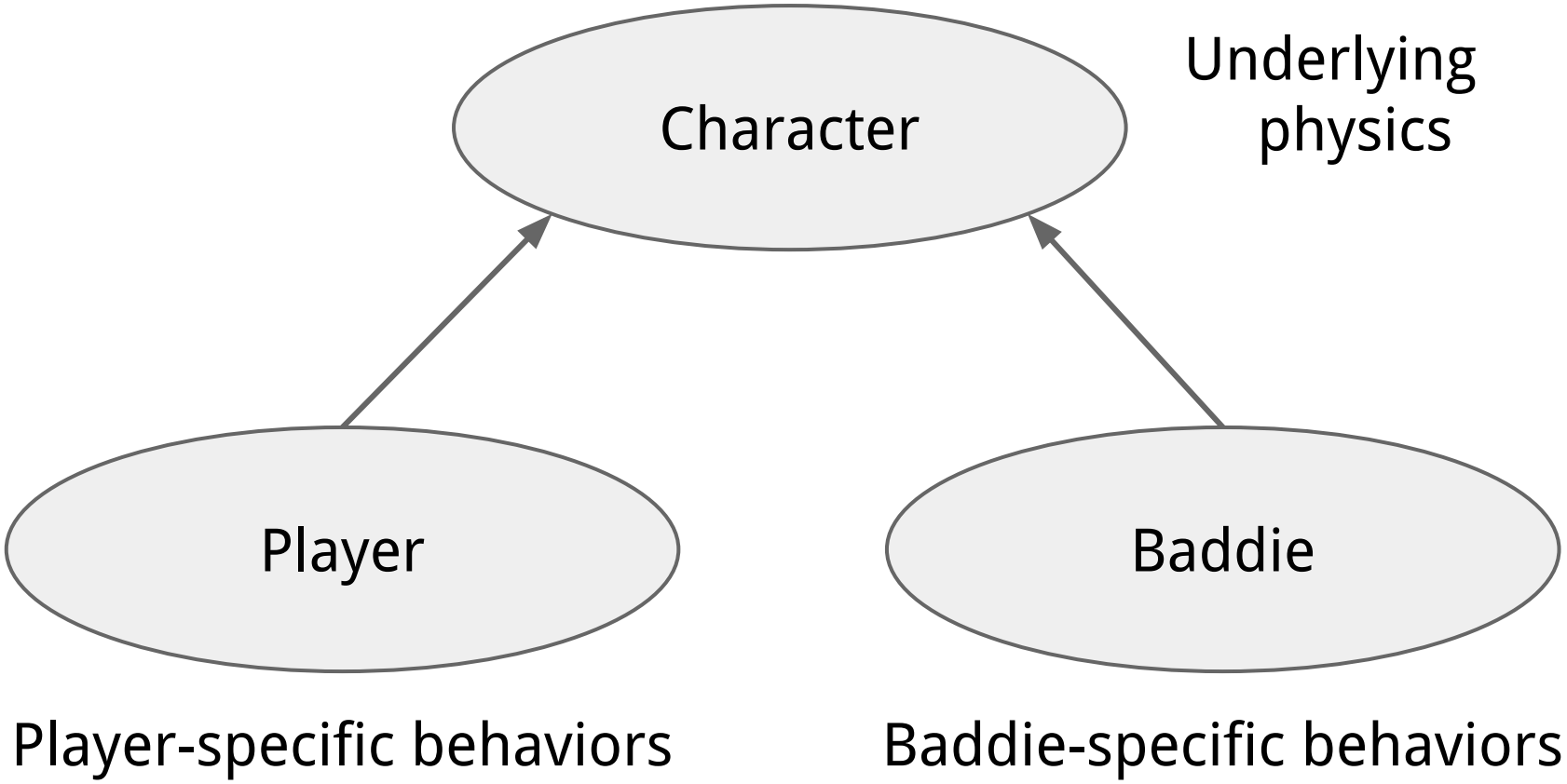
- what differentiates the player and baddies?

Not much

- “Physics” often the same (movement)
- may or may not pick up objects
- collision outcomes different
- special locations handling maybe different

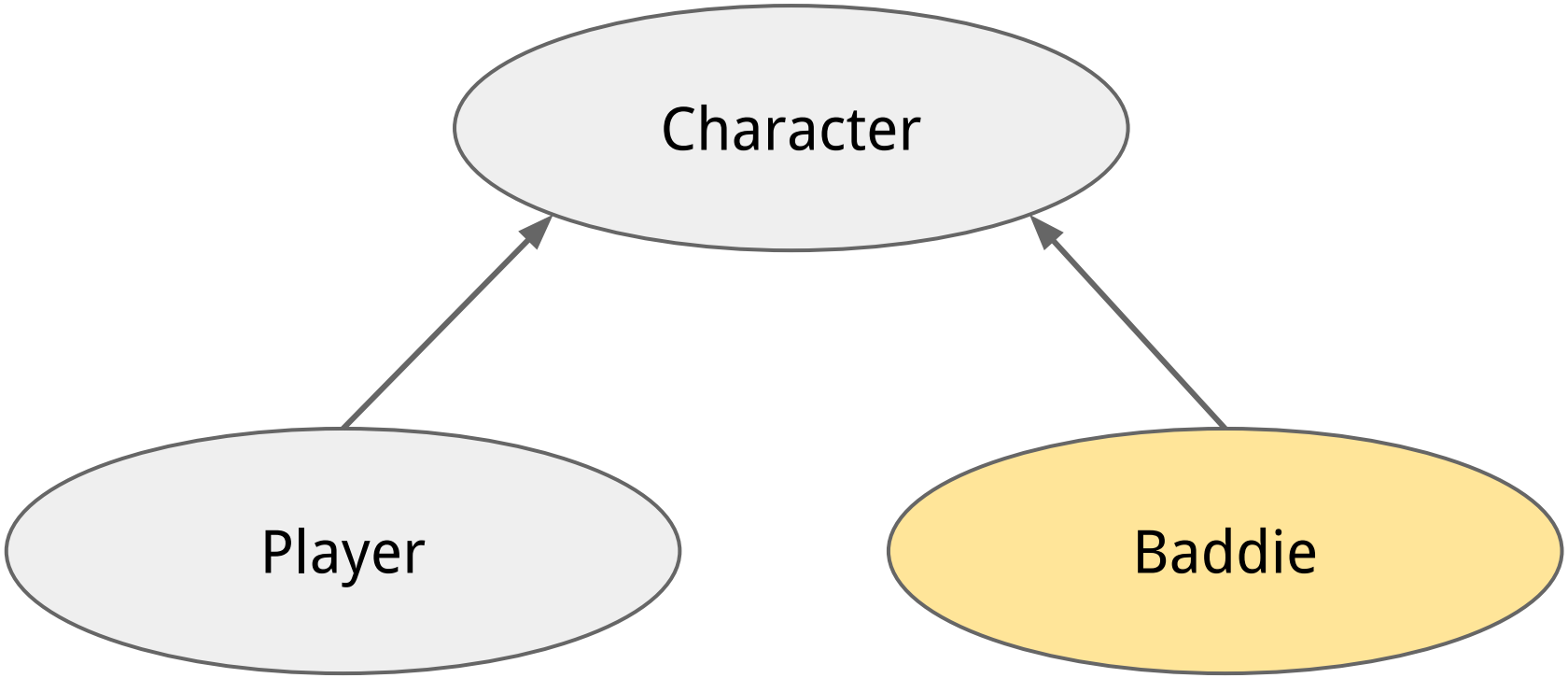
Representing characters

Common approach:



Representing characters

Common approach:



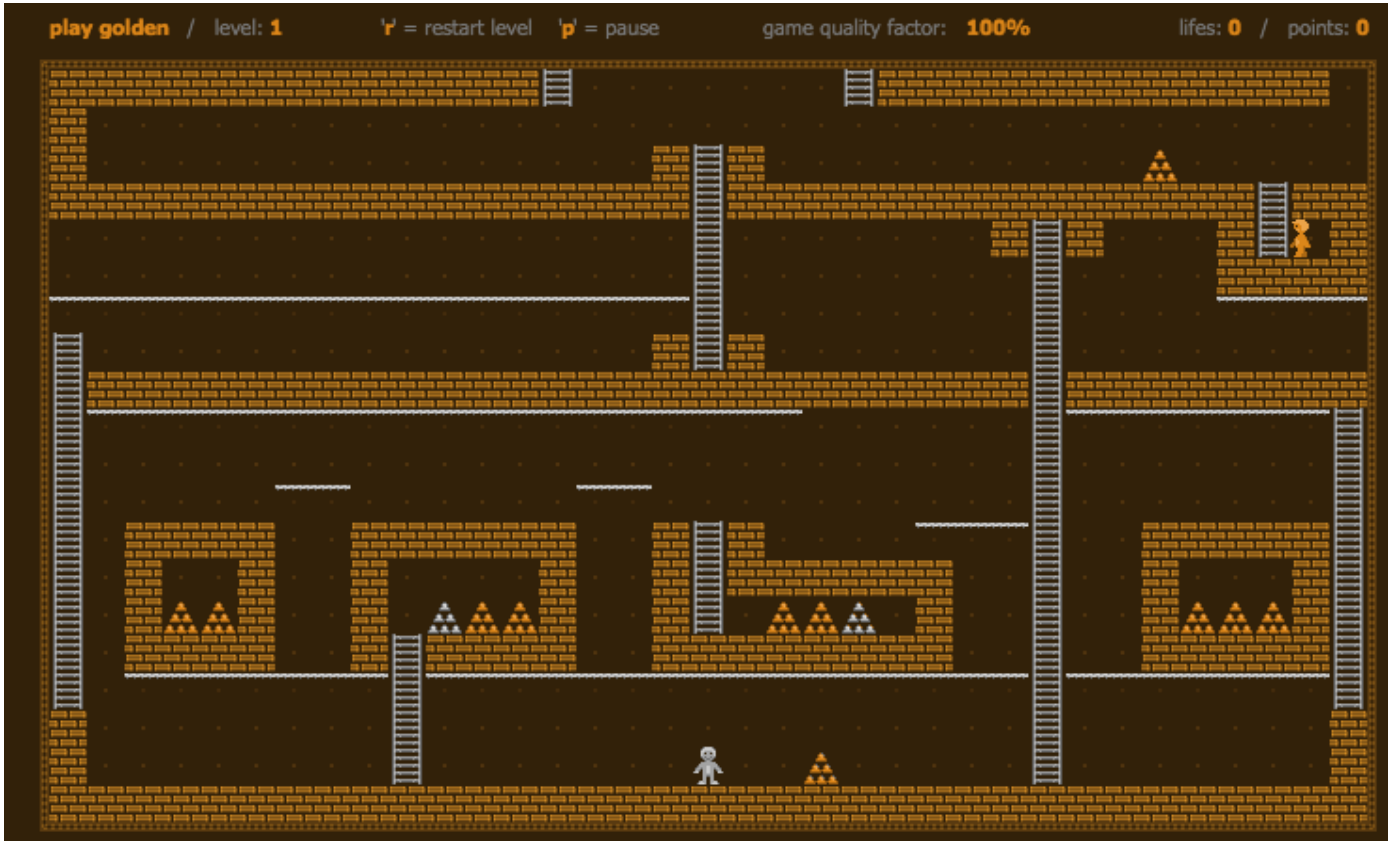
Proactive behavior!

Let’s look at some code

`maze.py`

- Look only at static level and player
- Next time: proactive behavior

Your project: Lode Runner



Cheap knock off @ http://goldenrunner.com/