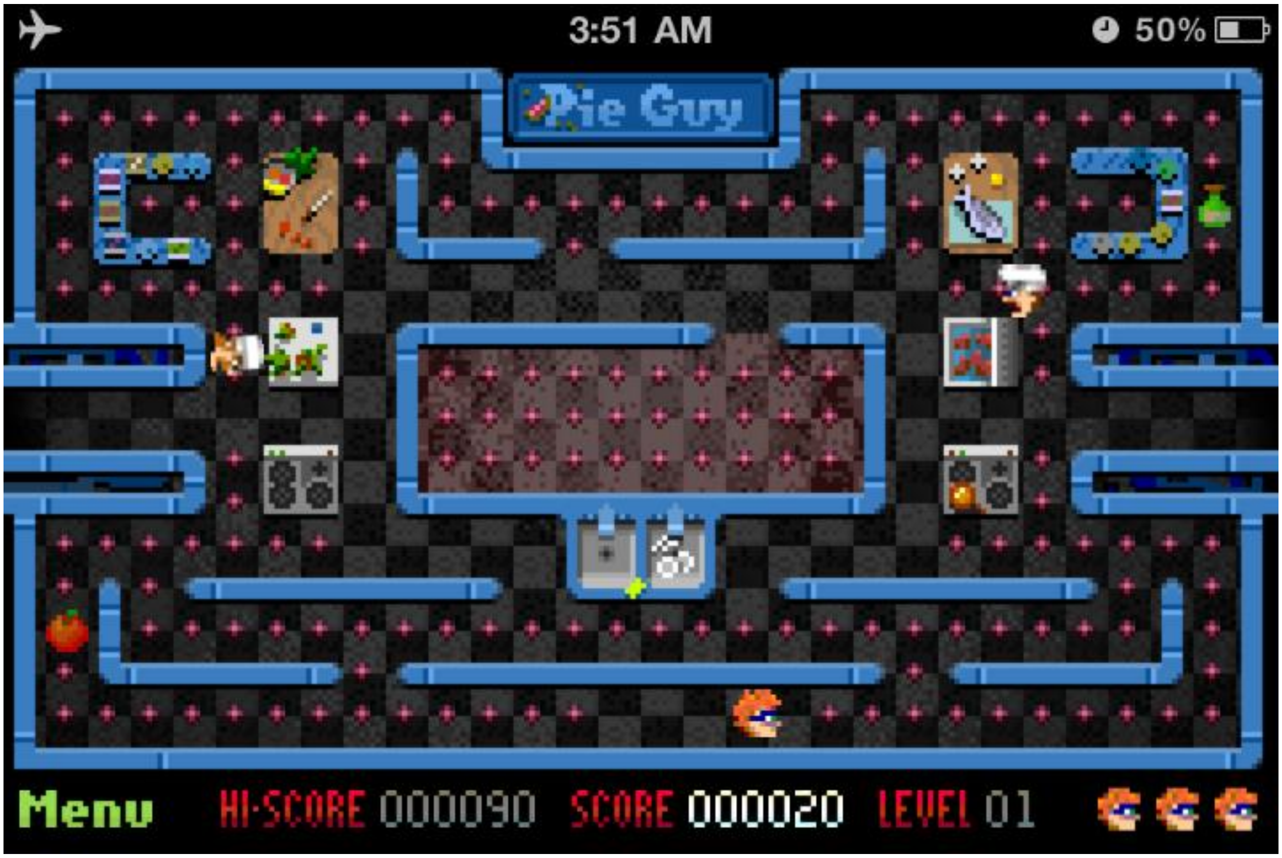
1

Introducing HTML5 Games

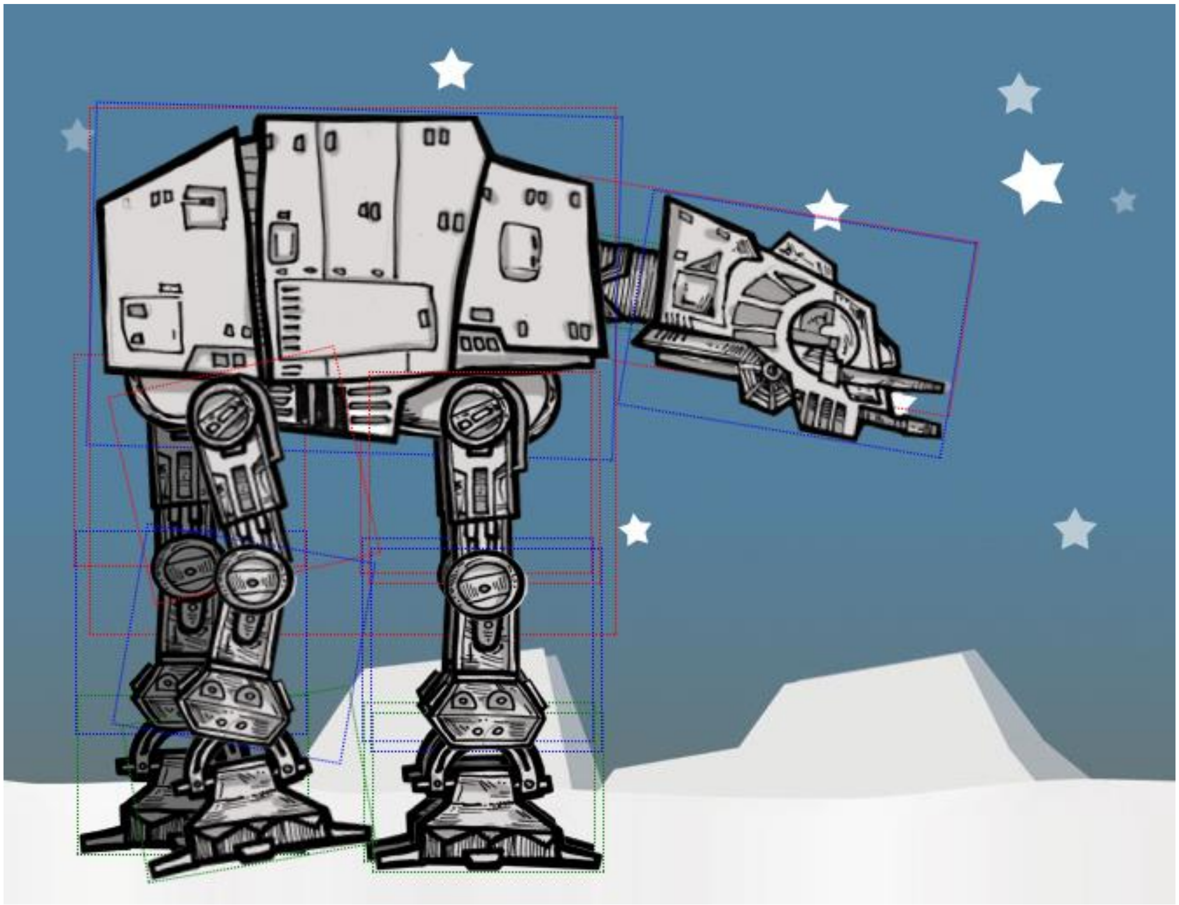
Discovering new features in HTML5

Offline applications



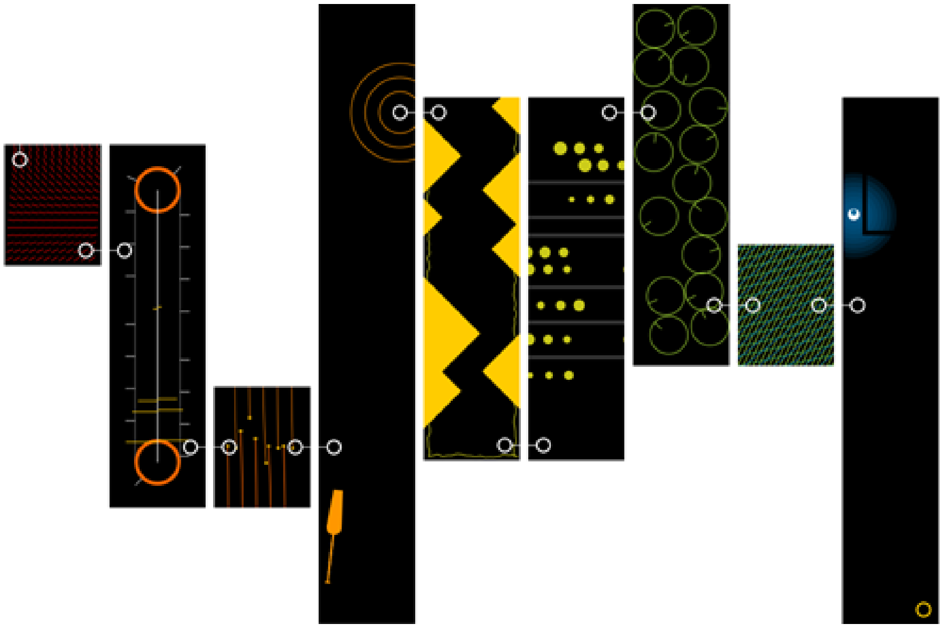
Discovering new features in CSS3

CSS3 animation



The benefit of creating HTML5 games

Breaking the boundary of usual browser games

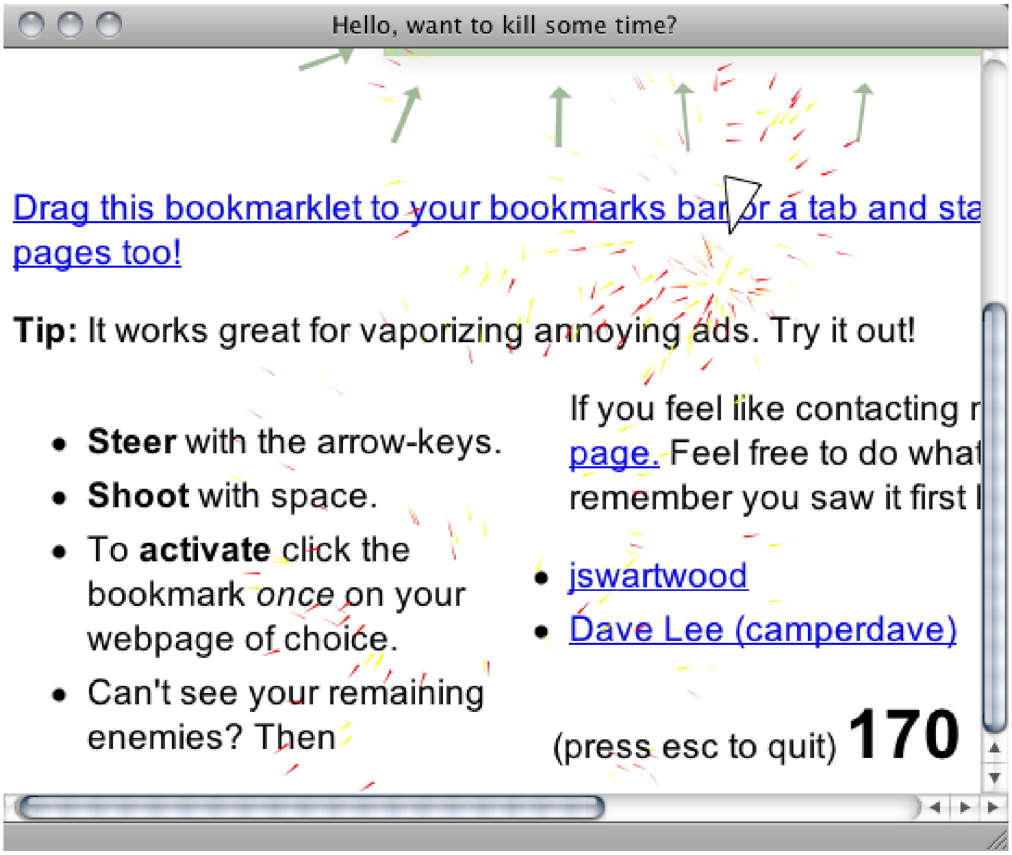


What others are playing with HTML5

Coca-Cola's Ahh campaign

YOUR FINGERS WANT TO PLAY SOCCER
- MAKE THEIR DAY AND PLAY
SHOOTOUT
TRY YOUR
HAND
OR YOUR FINGER REALLY,
AT A GAME OF
SMILE

Asteroid-styled bookmarklet



Drag this bookmarklet to your bookmarks bar or a tab and sta pages too!

Tip: It works great for vaporizing annoying ads. Try it out!

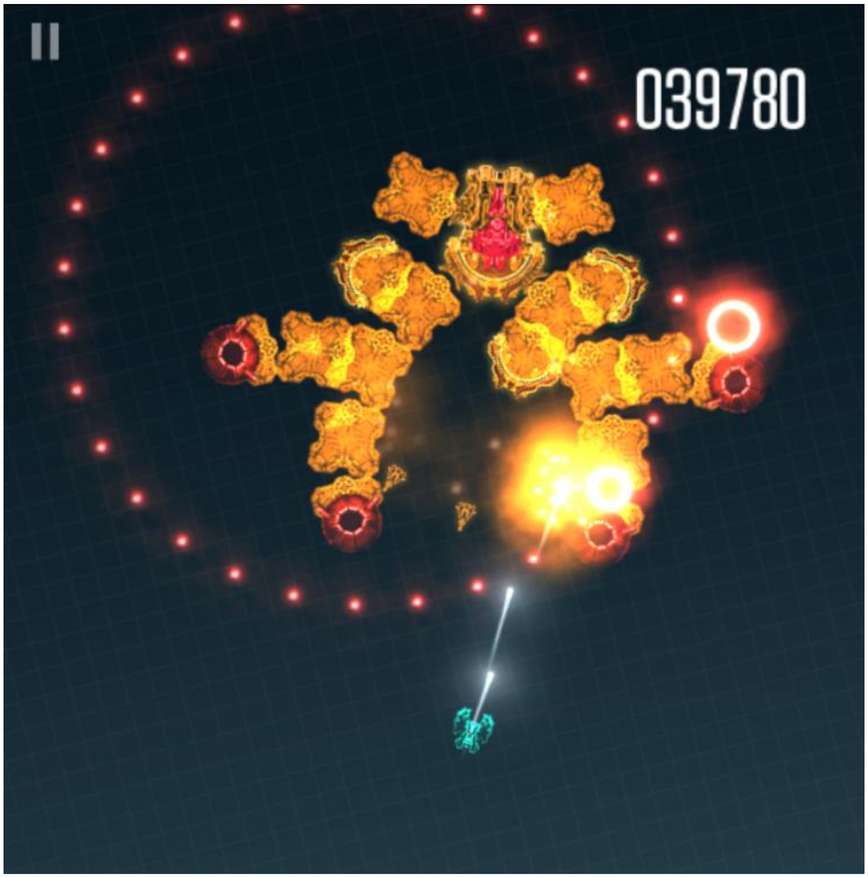
- **Steer** with the arrow-keys.
- **Shoot** with space.
- To **activate** click the bookmark *once* on your webpage of choice.
- Can't see your remaining enemies? Then

If you feel like contacting r page. Feel free to do what remember you saw it first l

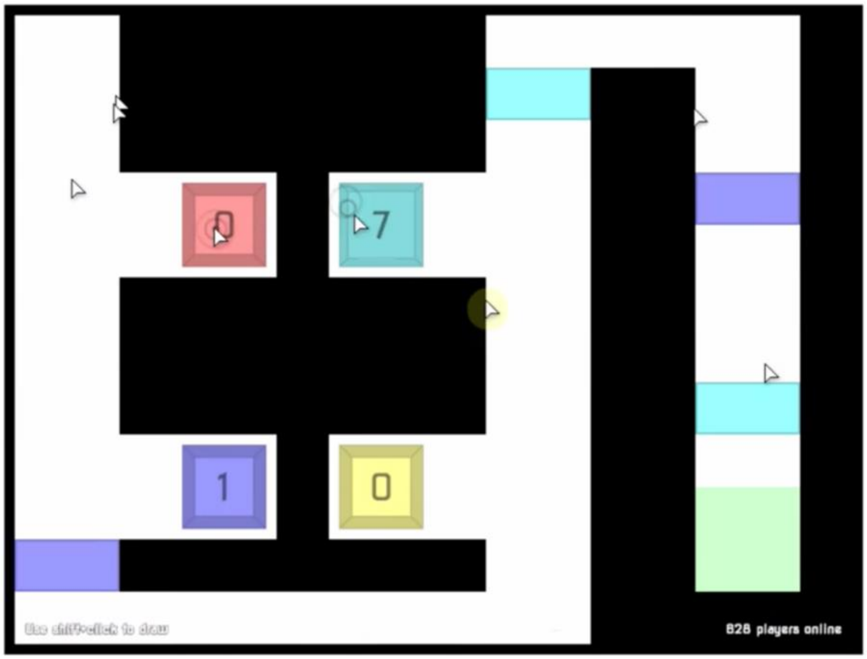
- jswartwood
- Dave Lee (camperdave)

(press esc to quit) **170**

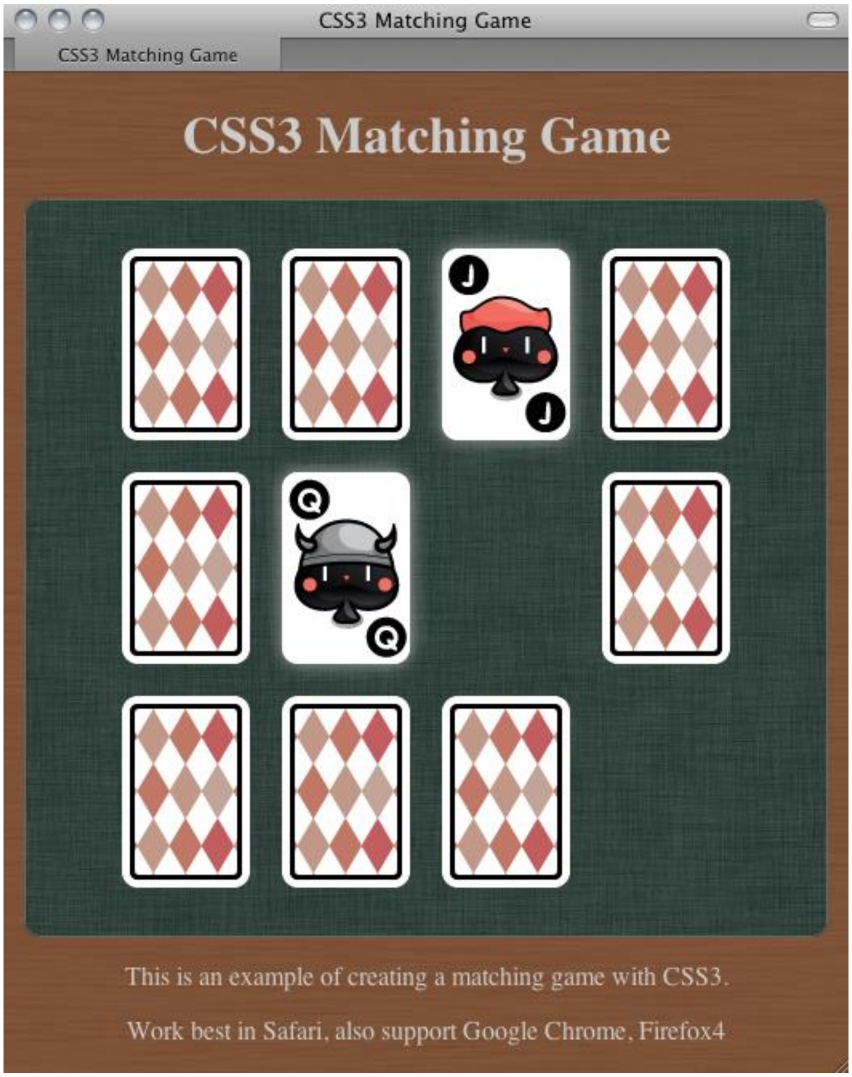
X-Type



Cursors.io



What we are going to create in this book

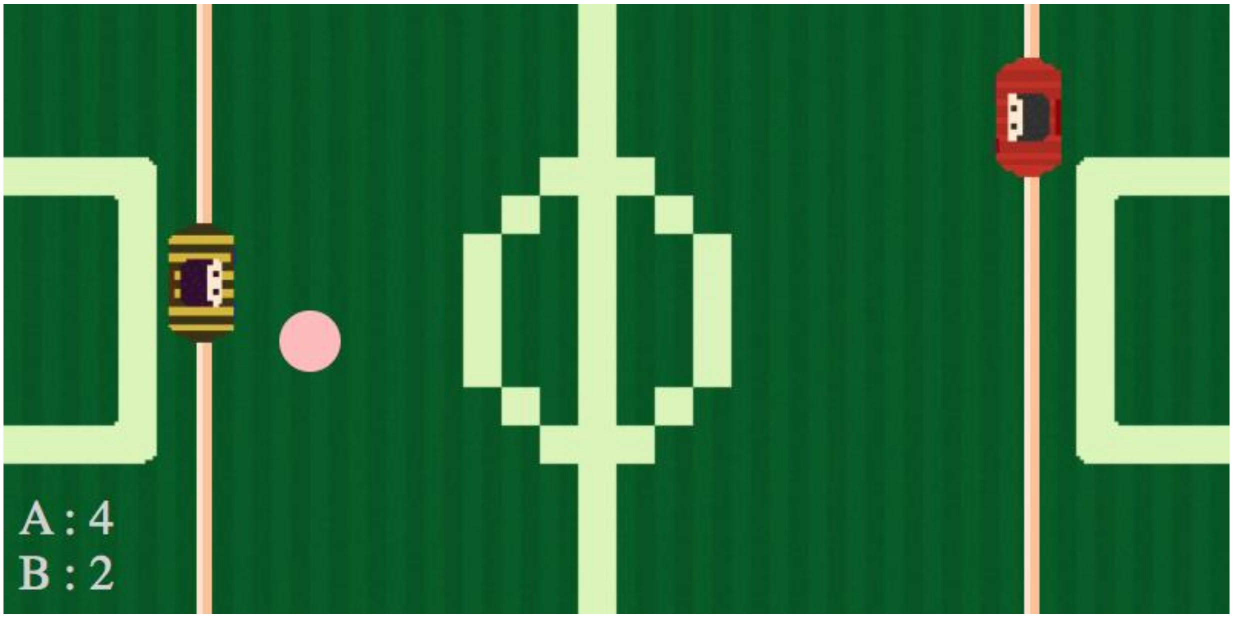


CSS3 Matching Game

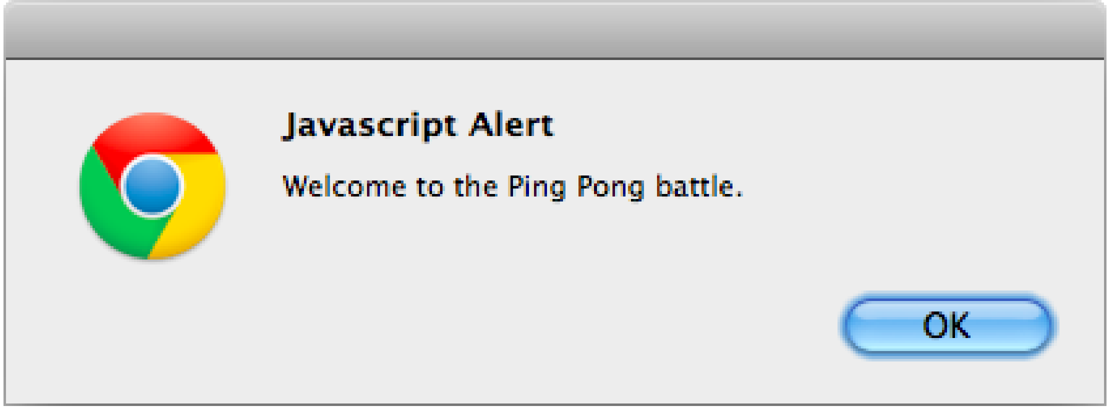
This is an example of creating a matching game with CSS3.

Work best in Safari, also support Google Chrome, Firefox4

2
Getting Started with DOM-based Game Development



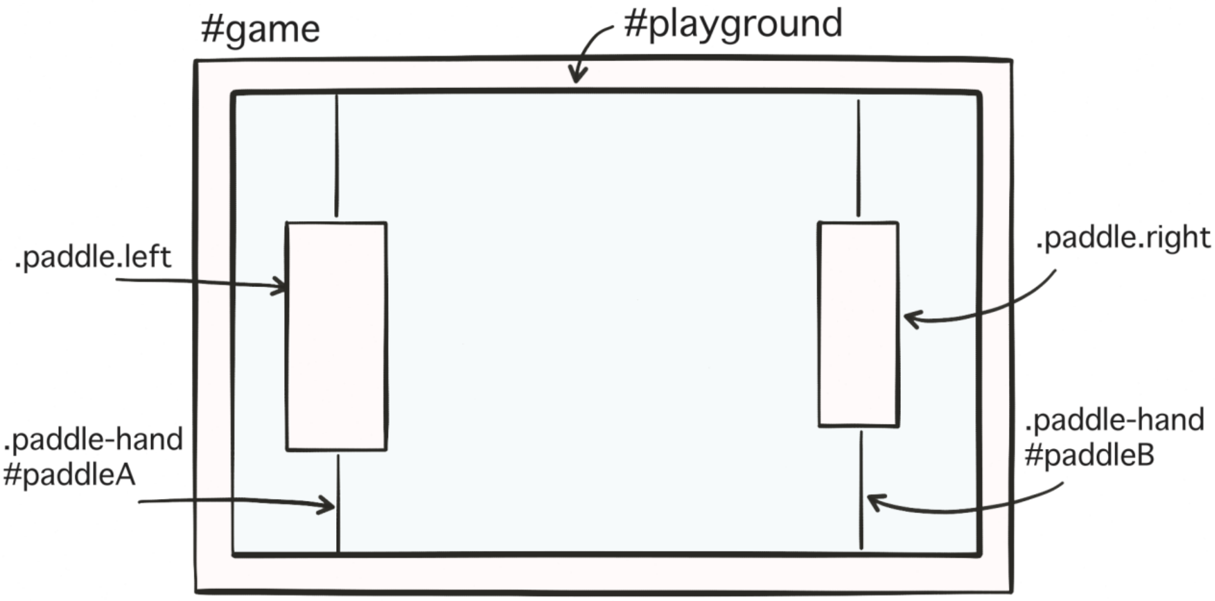
Preparing the HTML documents for a DOM-based game

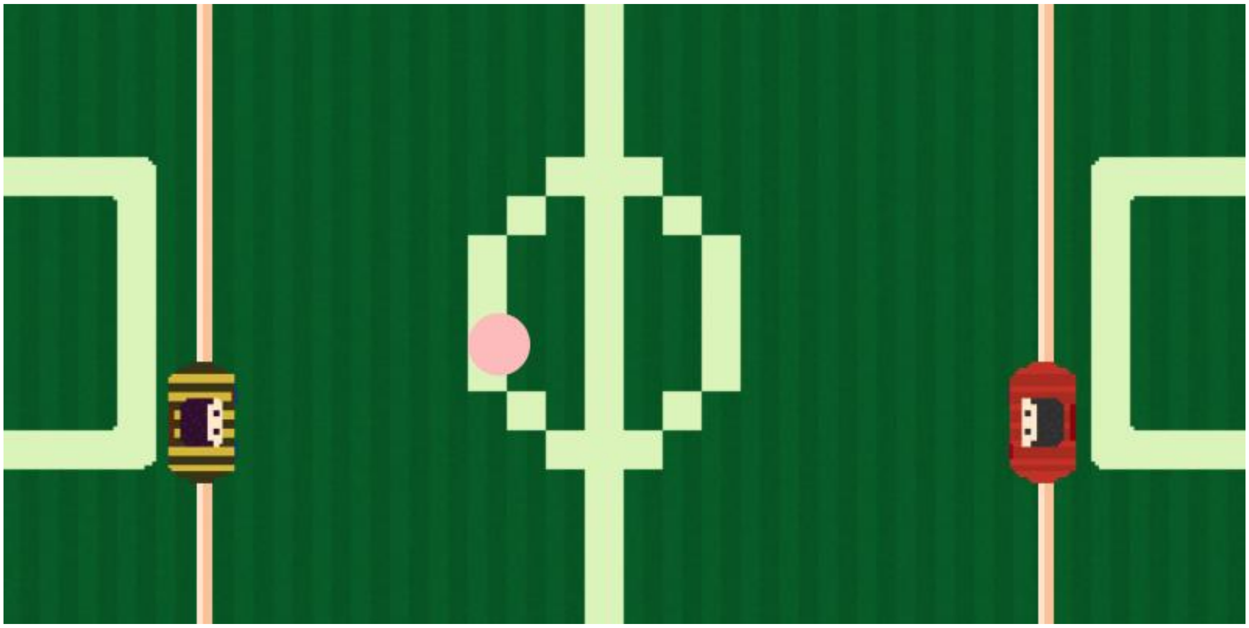

Javascript Alert

Welcome to the Ping Pong battle.

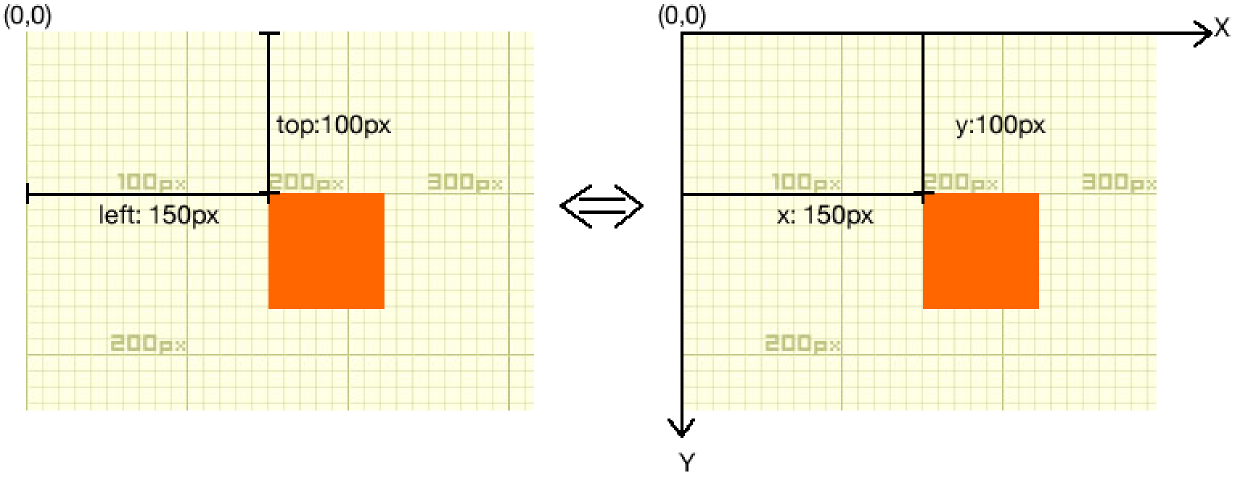
Downloading the image assets

Setting up the Ping Pong game elements



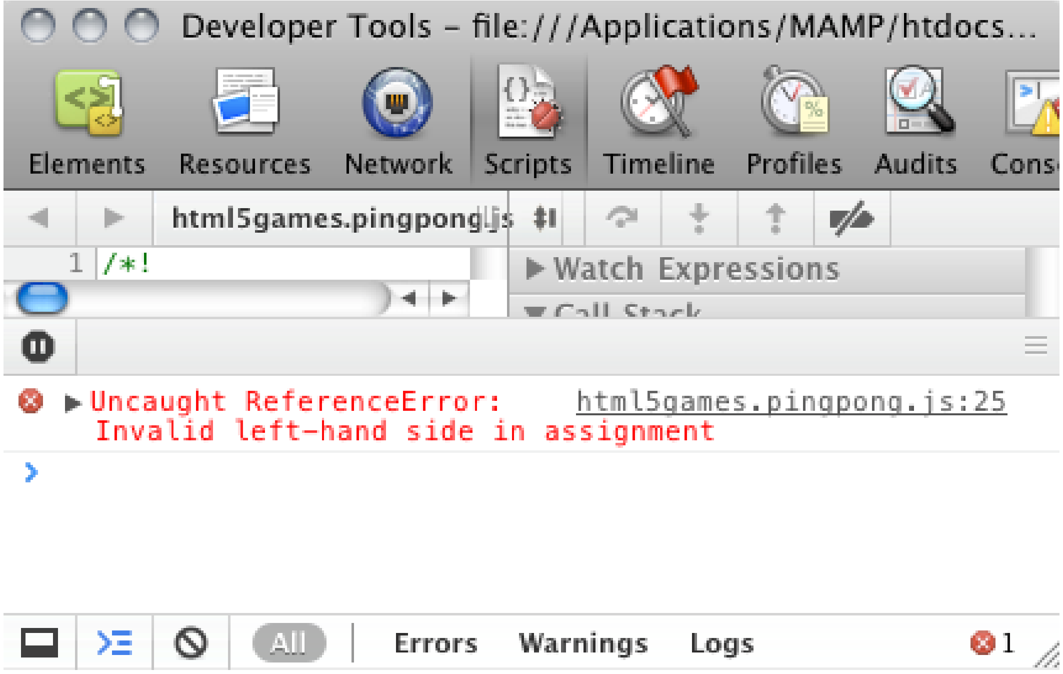


Understanding the behavior of absolute position



Getting mouse input

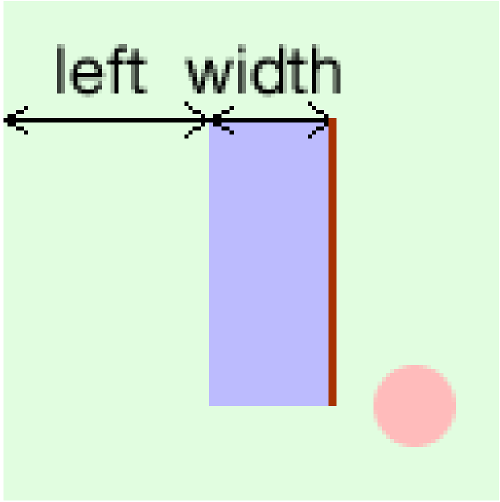
Checking the console window

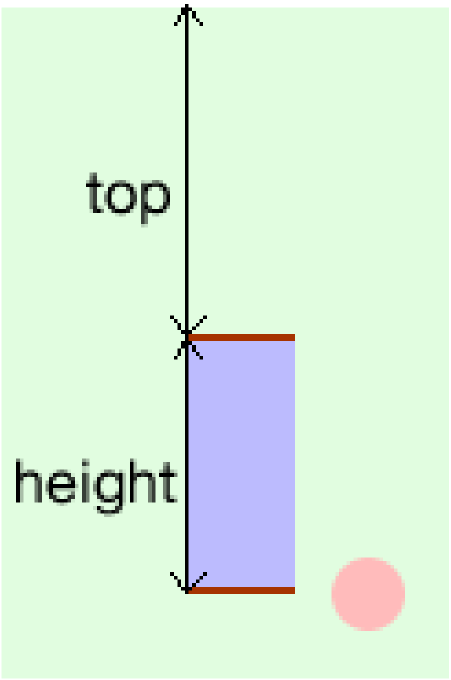


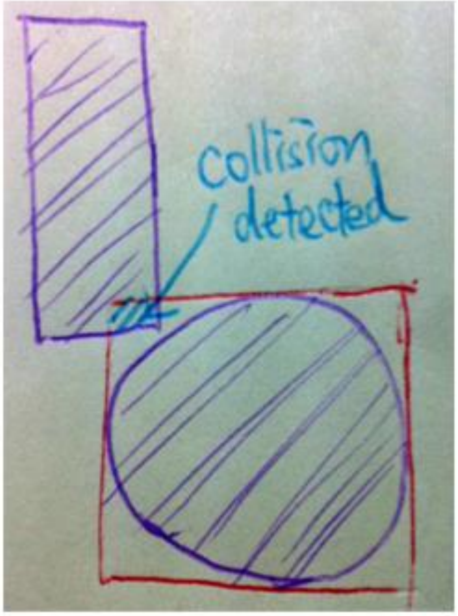
```
/*!
```

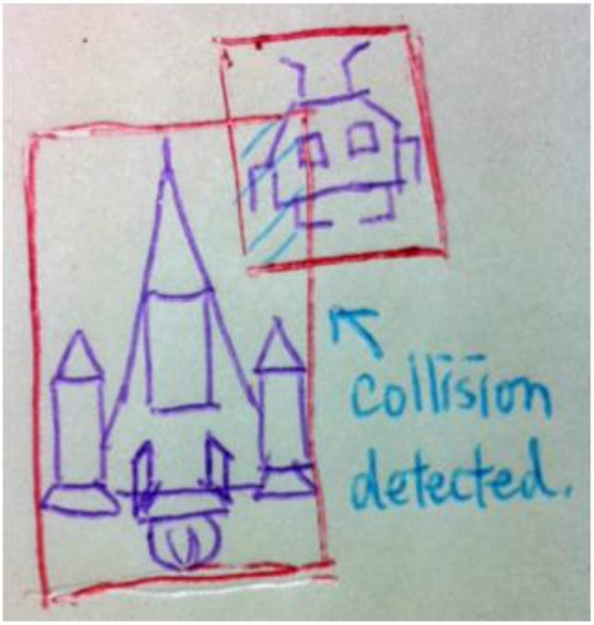
```
Uncaught ReferenceError:          html5games.pingpong.js:25
 Invalid left-hand side in assignment
```

Beginning collision detection





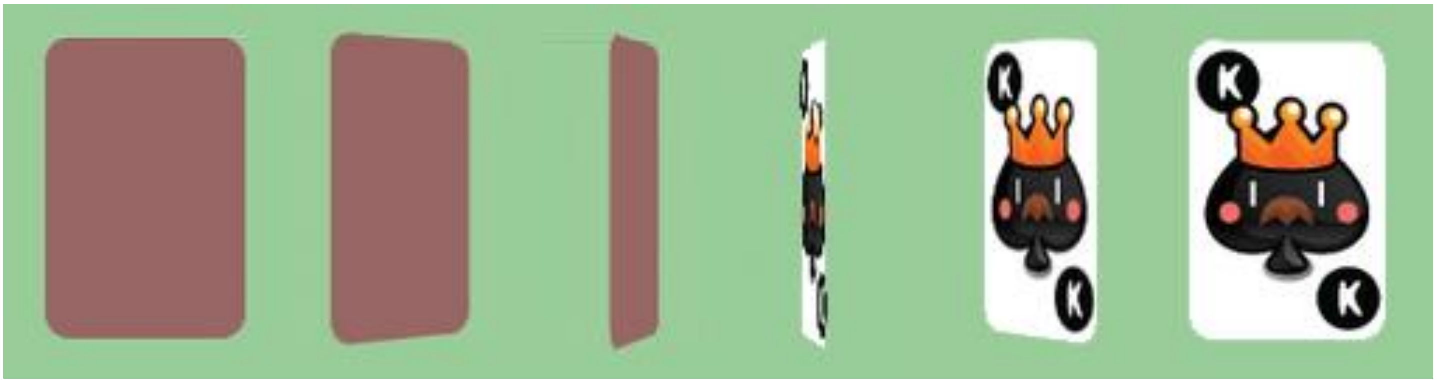

Collision detected


Collision detected.

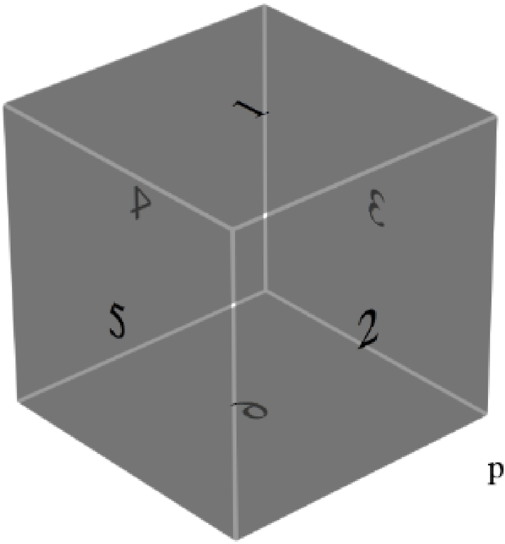
3
Building a Card Matching Game in CSS3

Moving game objects with CSS3 transition

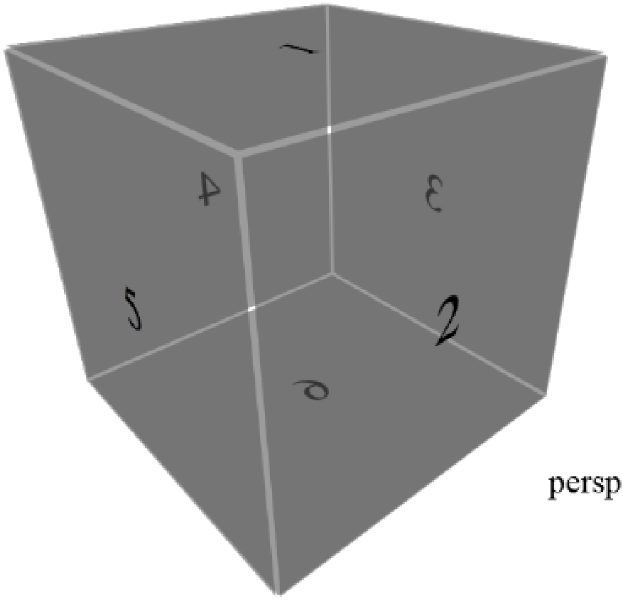
Creating a card-flipping effect



Introducing CSS' perspective property



perspective: 3000

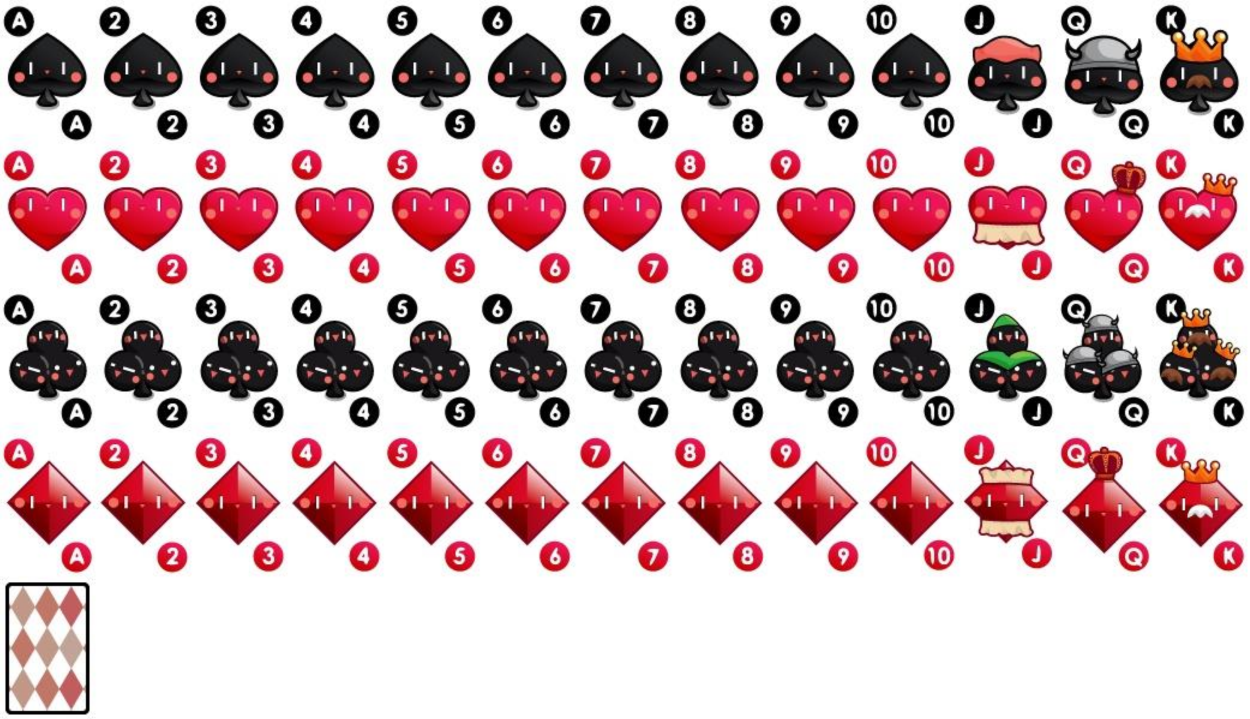


perspective: 600

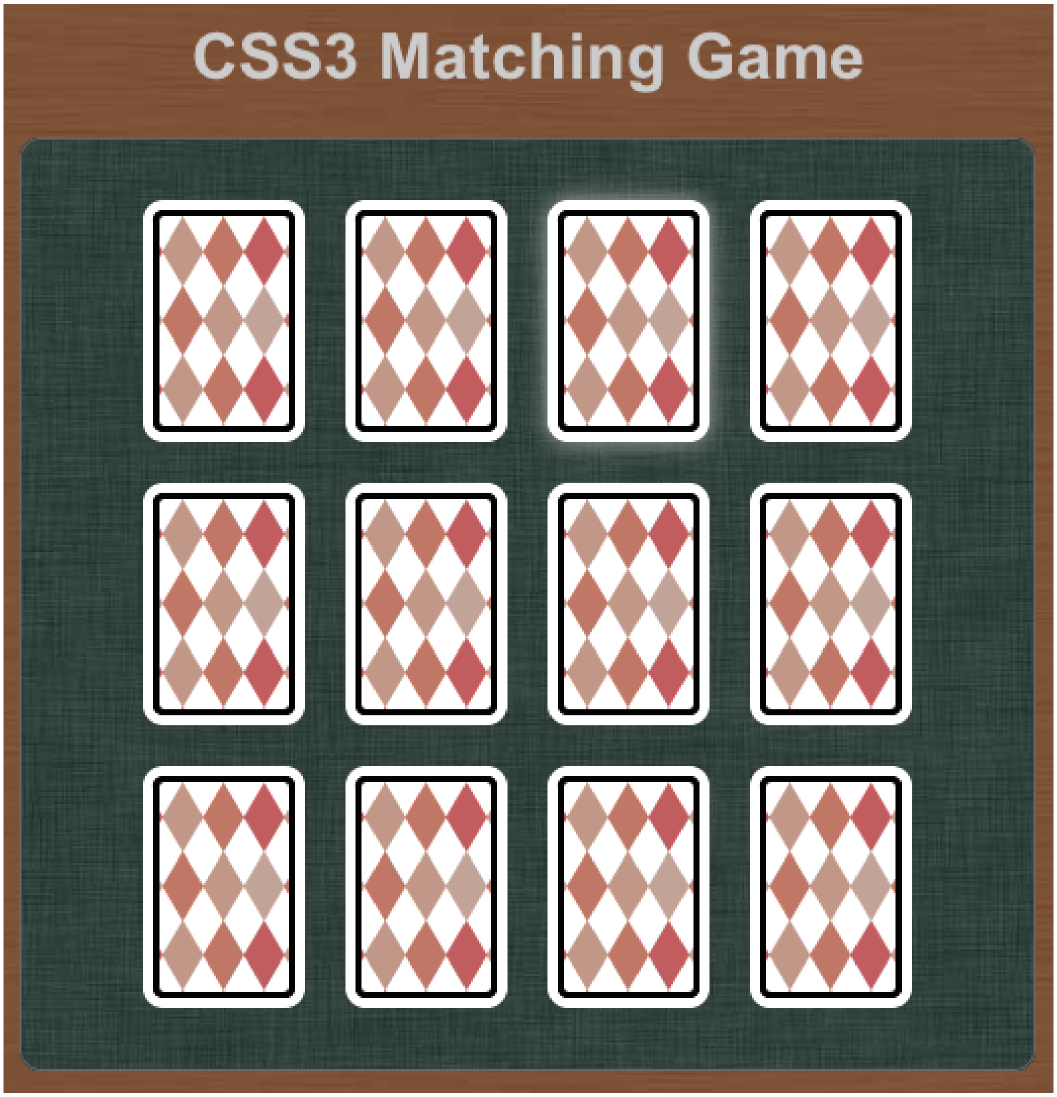
Introducing backface-visibility

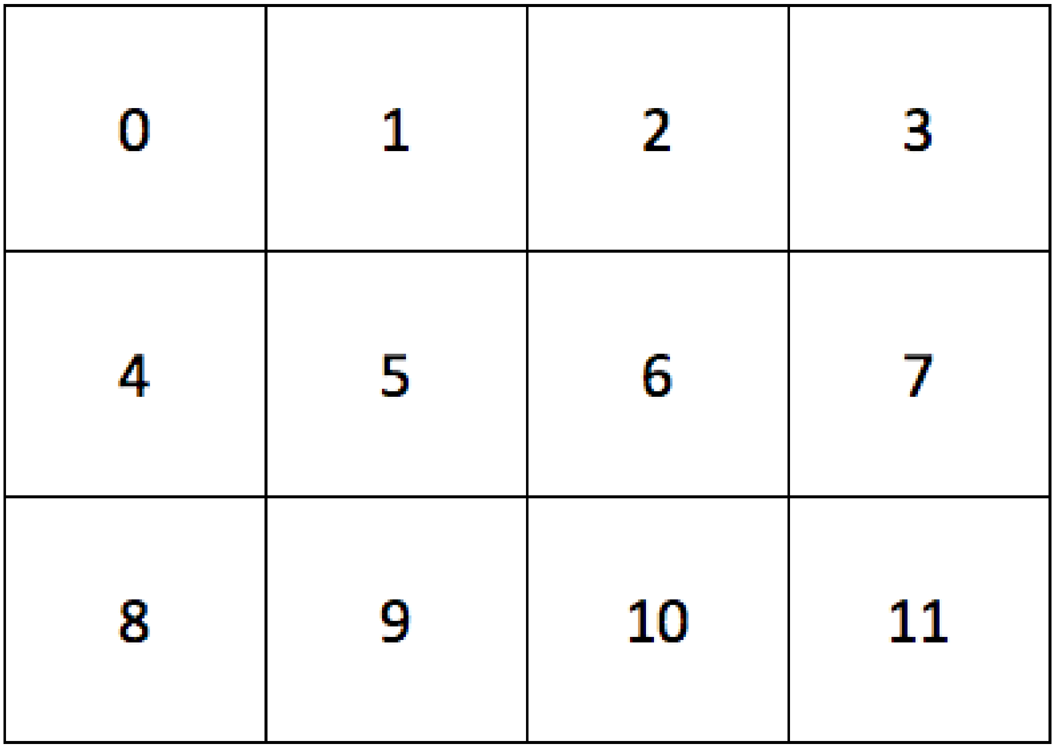
Creating a card-matching memory game

Downloading the sprites sheet of playing cards



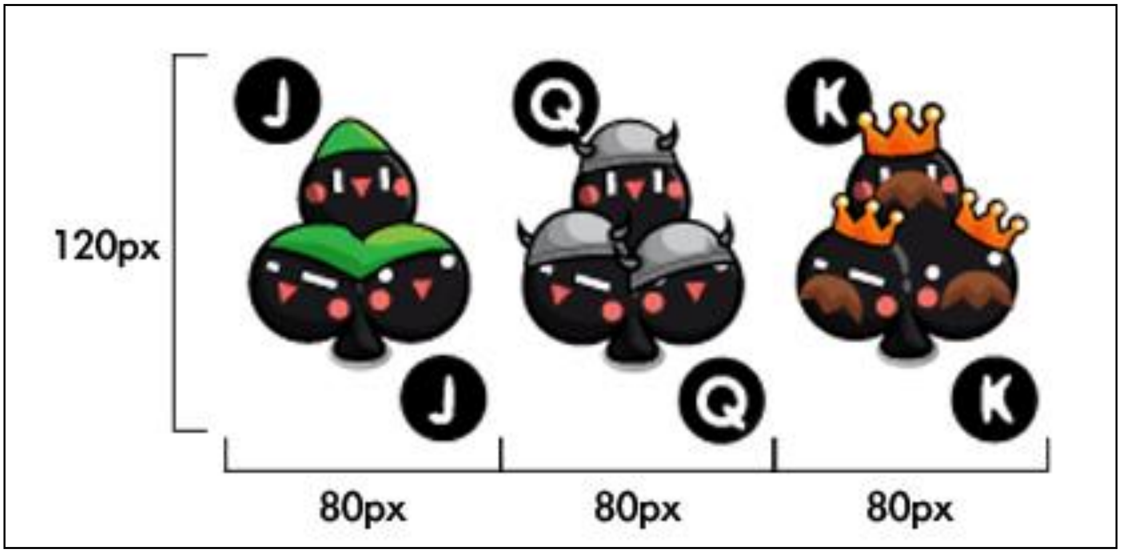
Setting up the game environment

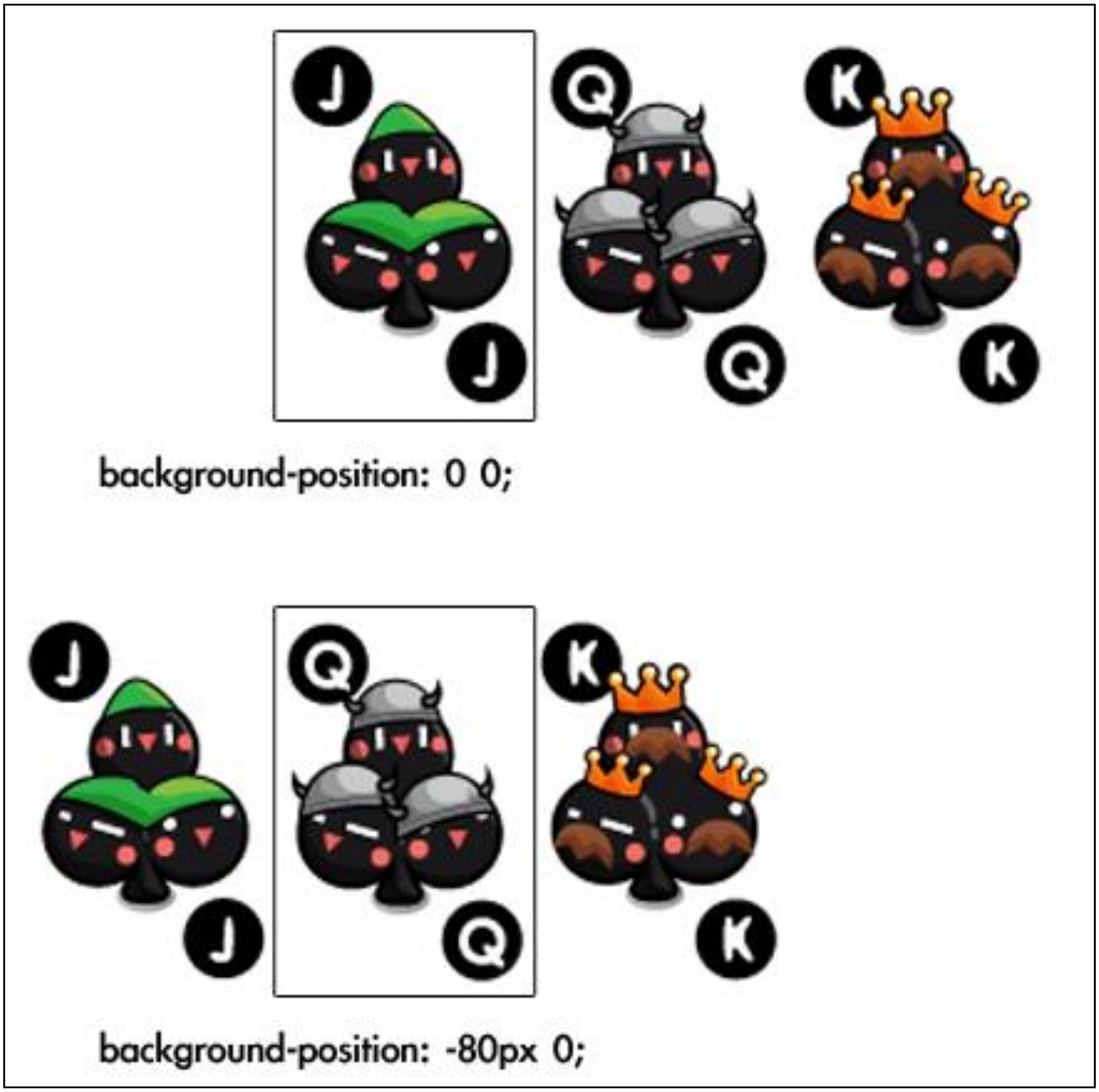




0	1	2	3
4	5	6	7
8	9	10	11

Using CSS sprite with a background position

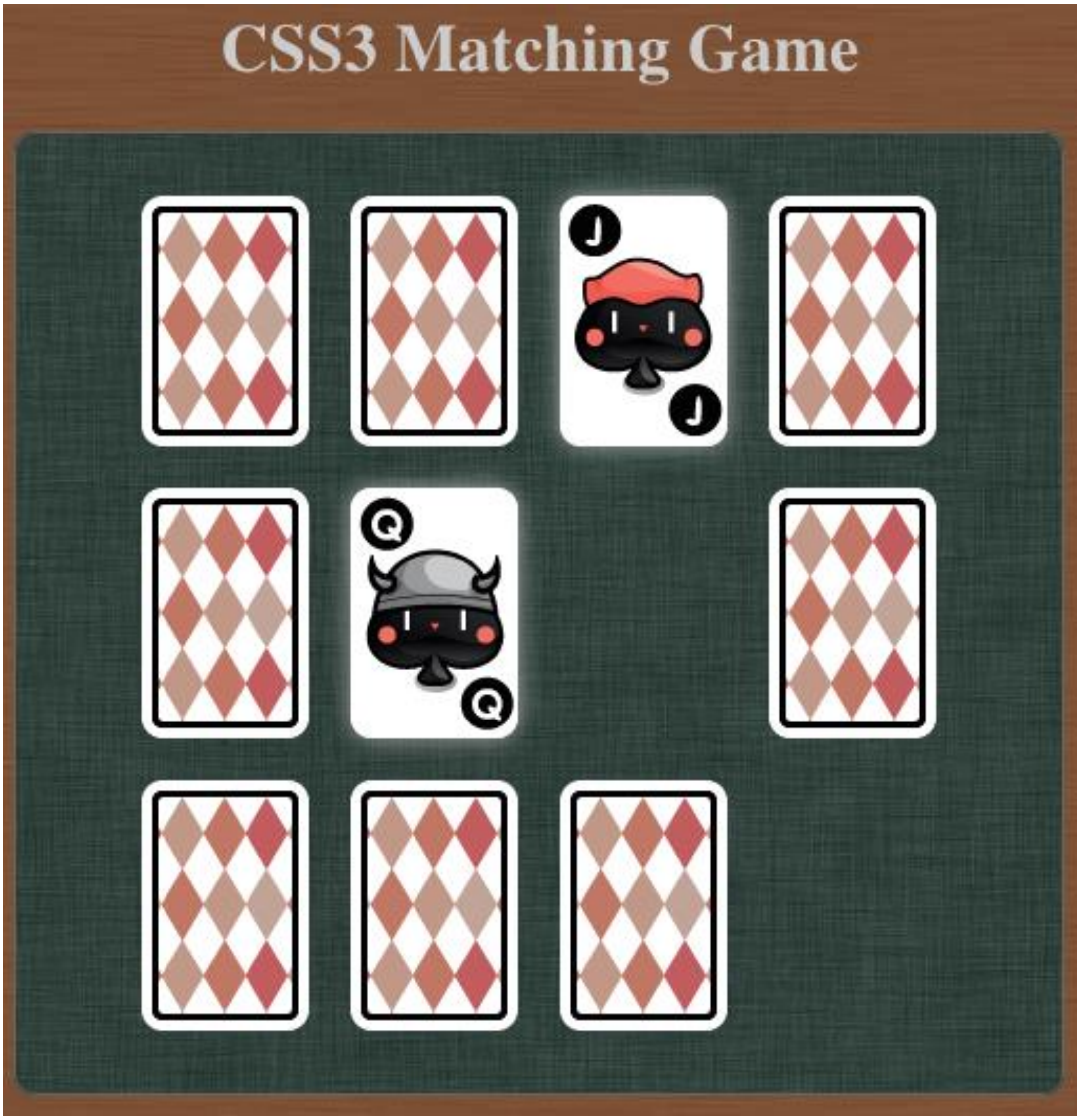




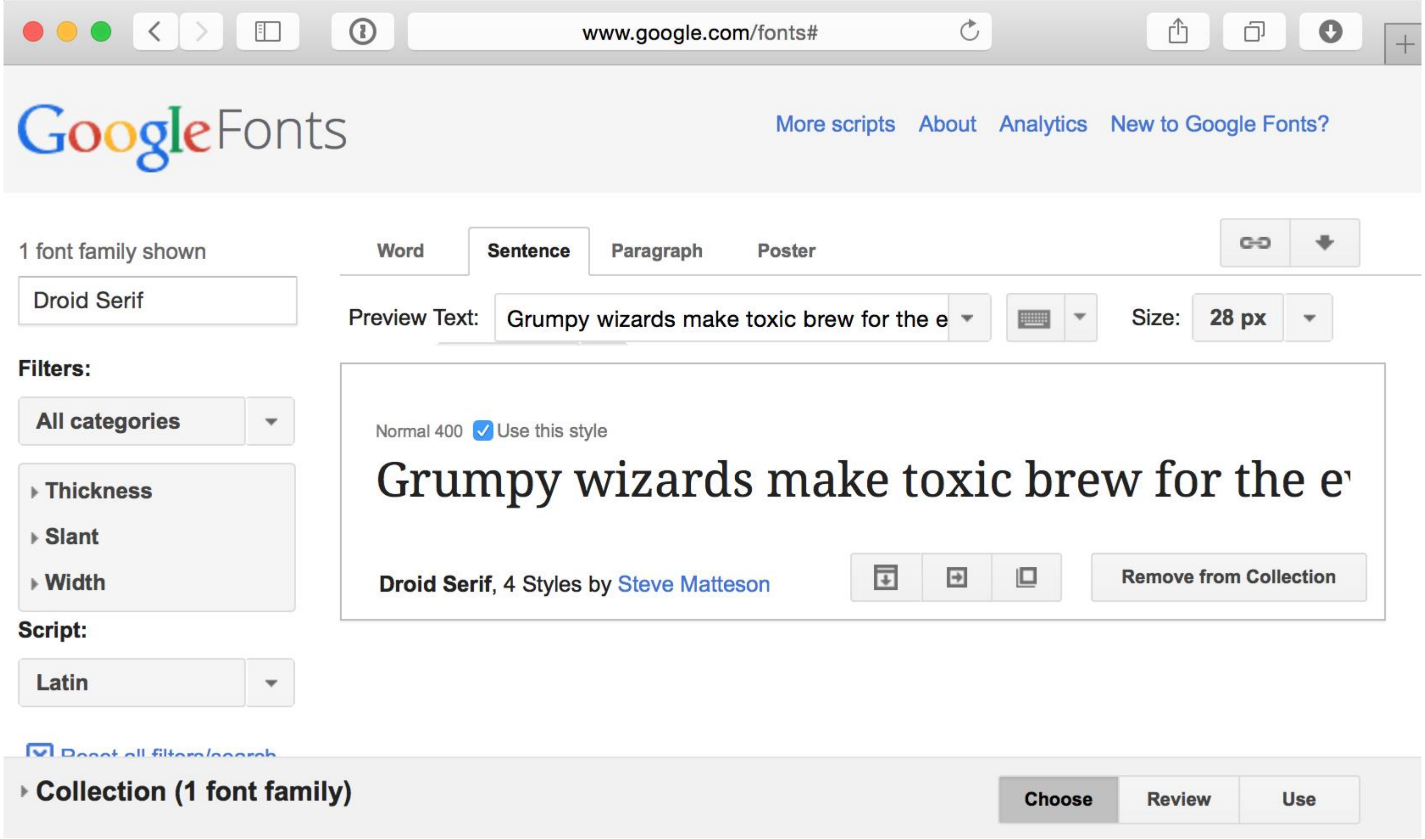
background-position: 0 0;

background-position: -80px 0;

Adding game logic to the matching game



Embedding web fonts into our game



www.google.com/fonts#

1 font family shown

Droid Serif

Filters: All categories

Script: Latin

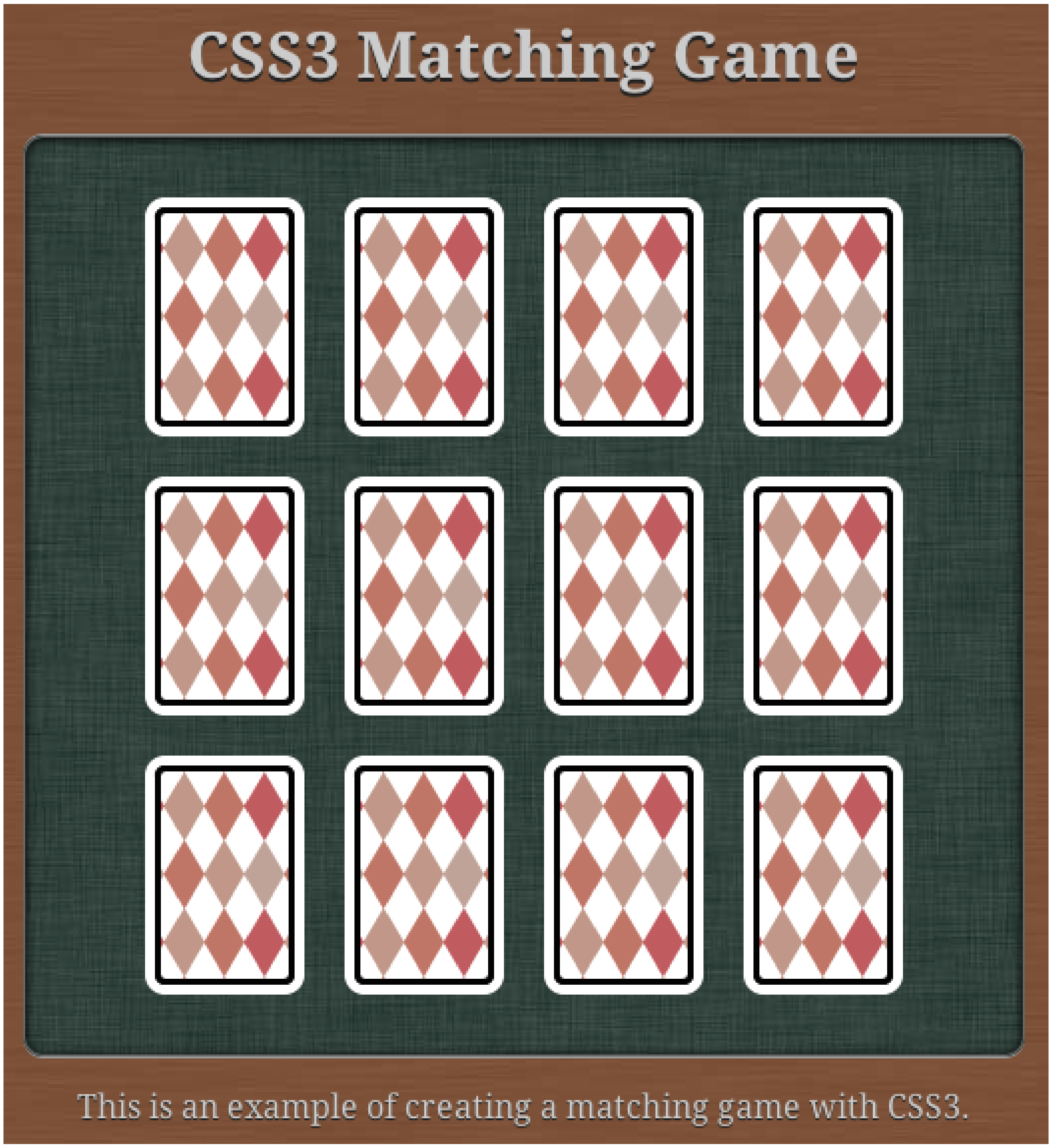
Preview Text: Grumpy wizards make toxic brew for the e

Size: 28 px

Normal 400 ☑ Use this style

Grumpy wizards make toxic brew for the ev

Droid Serif, 4 Styles by Steve Matteson

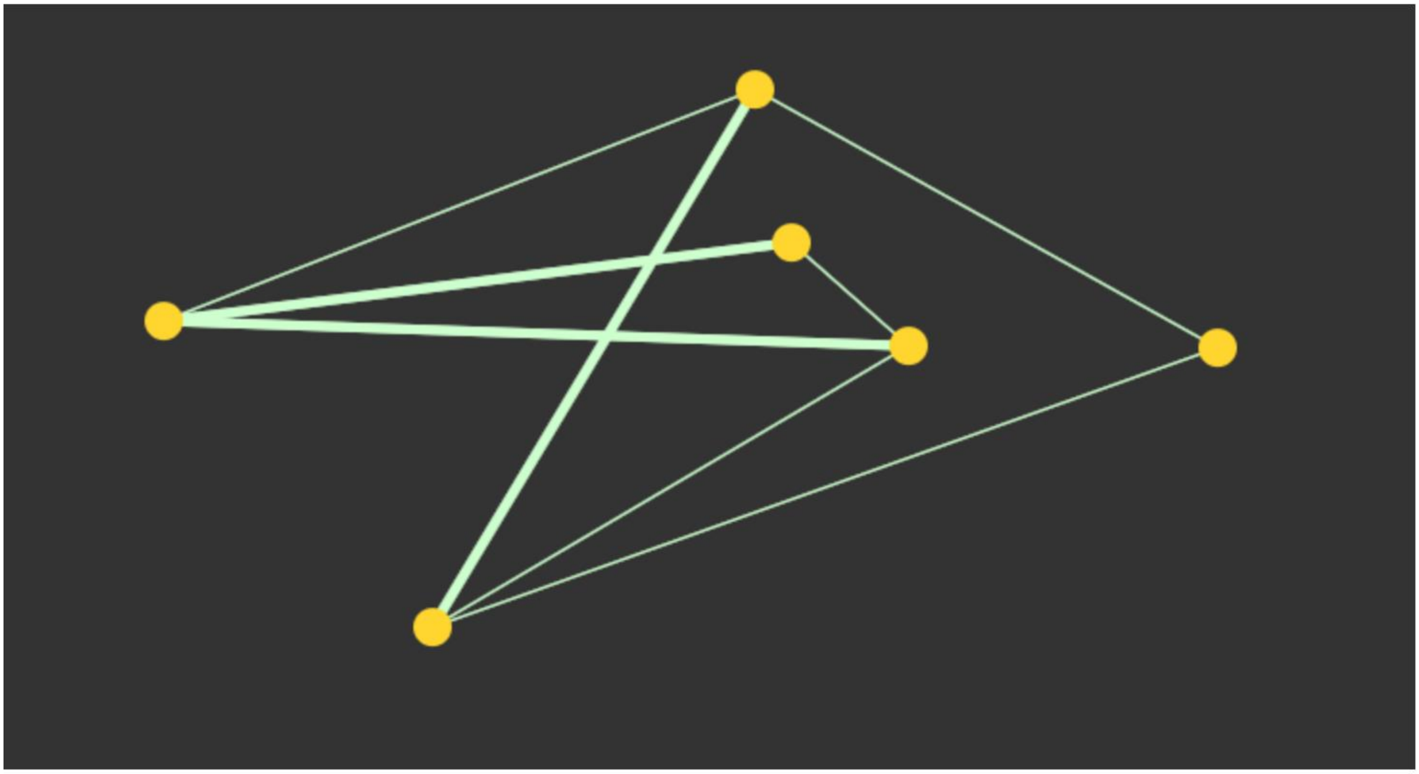


CSS3 Matching Game

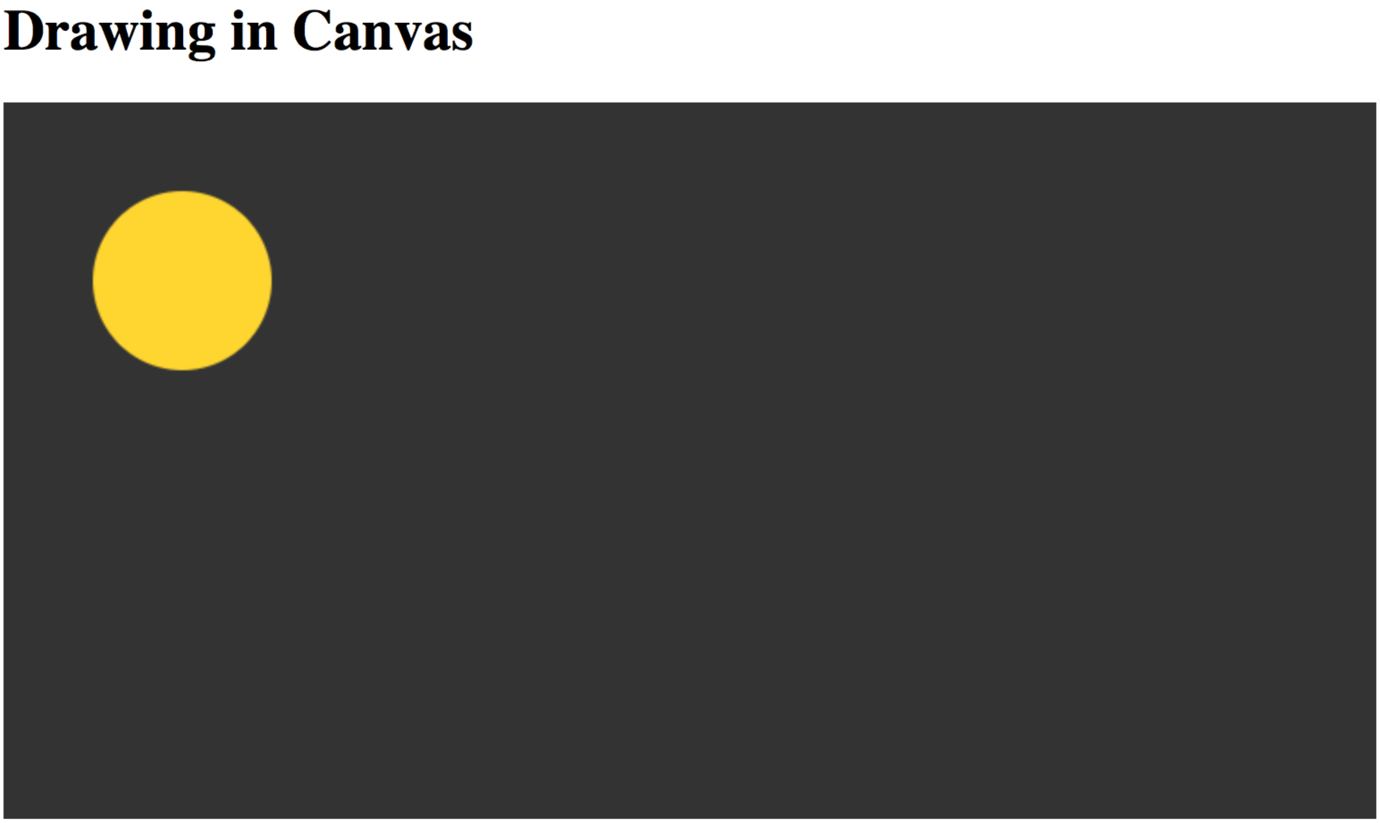
This is an example of creating a matching game with CSS3.

4

Building the Untangle Game with Canvas and the Drawing API

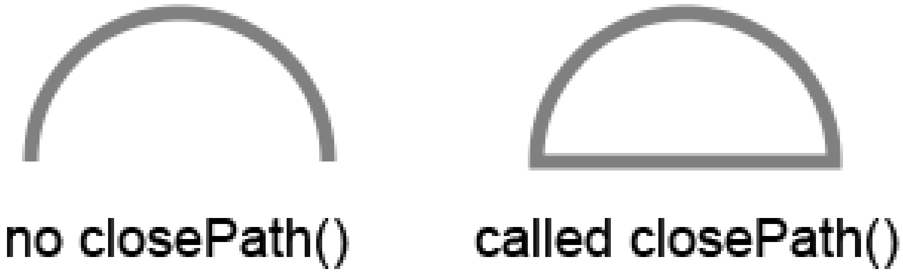


Drawing a circle in the Canvas

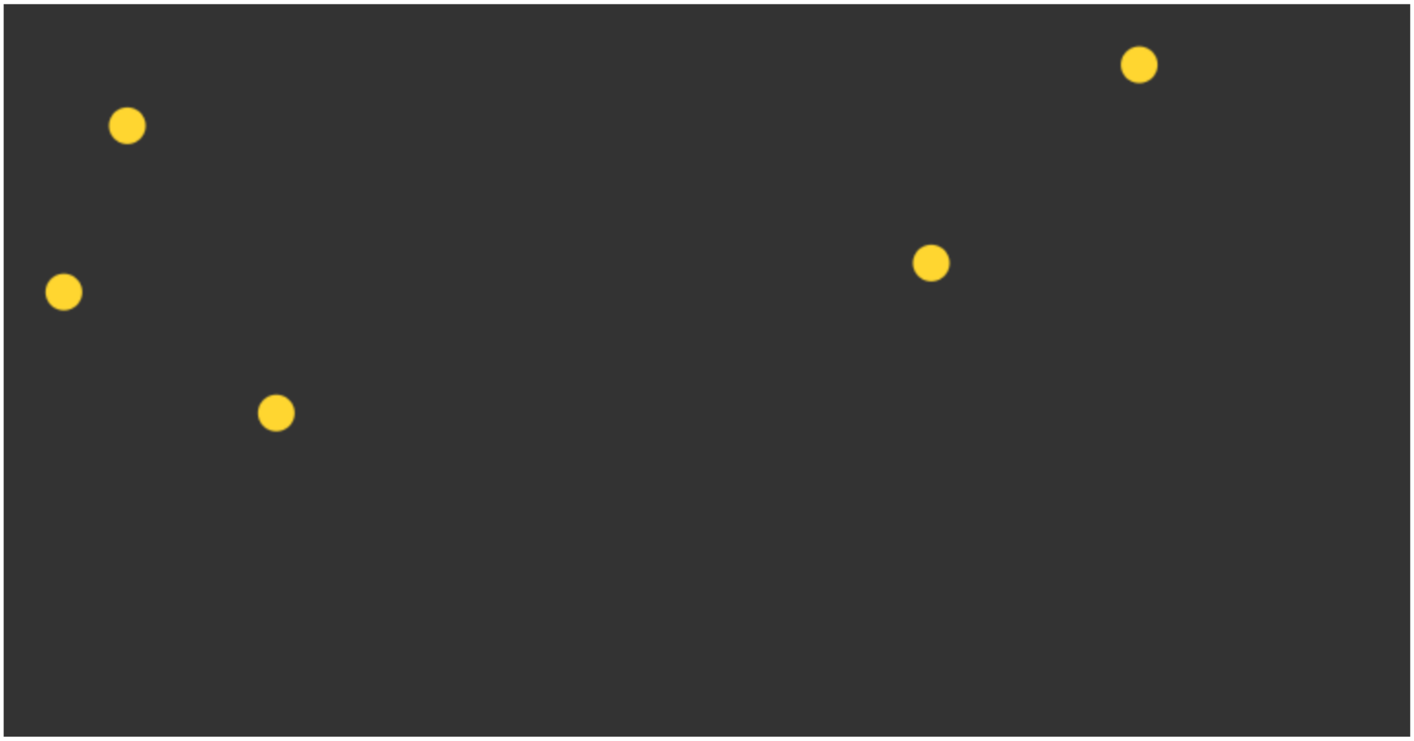


Drawing in Canvas

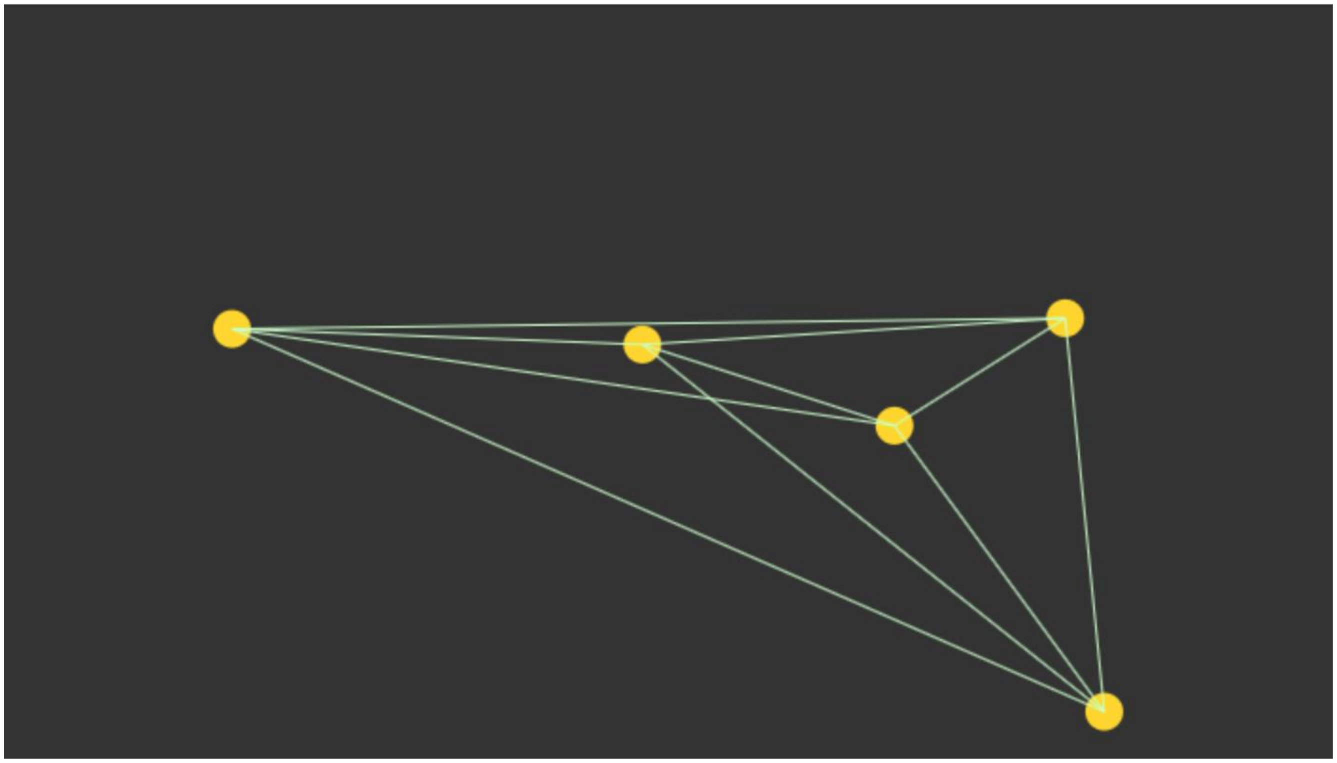
Closing a path



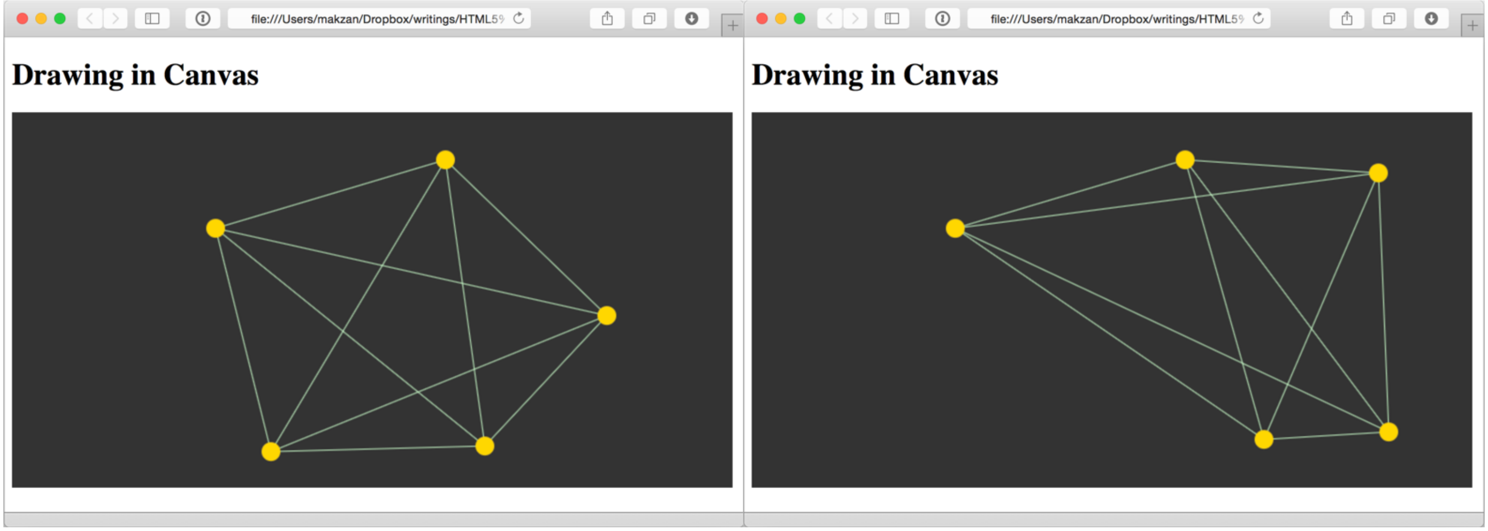
Wrapping the circle drawing in a function



Drawing lines in the Canvas



Using mouse events to interact with objects drawn in the Canvas

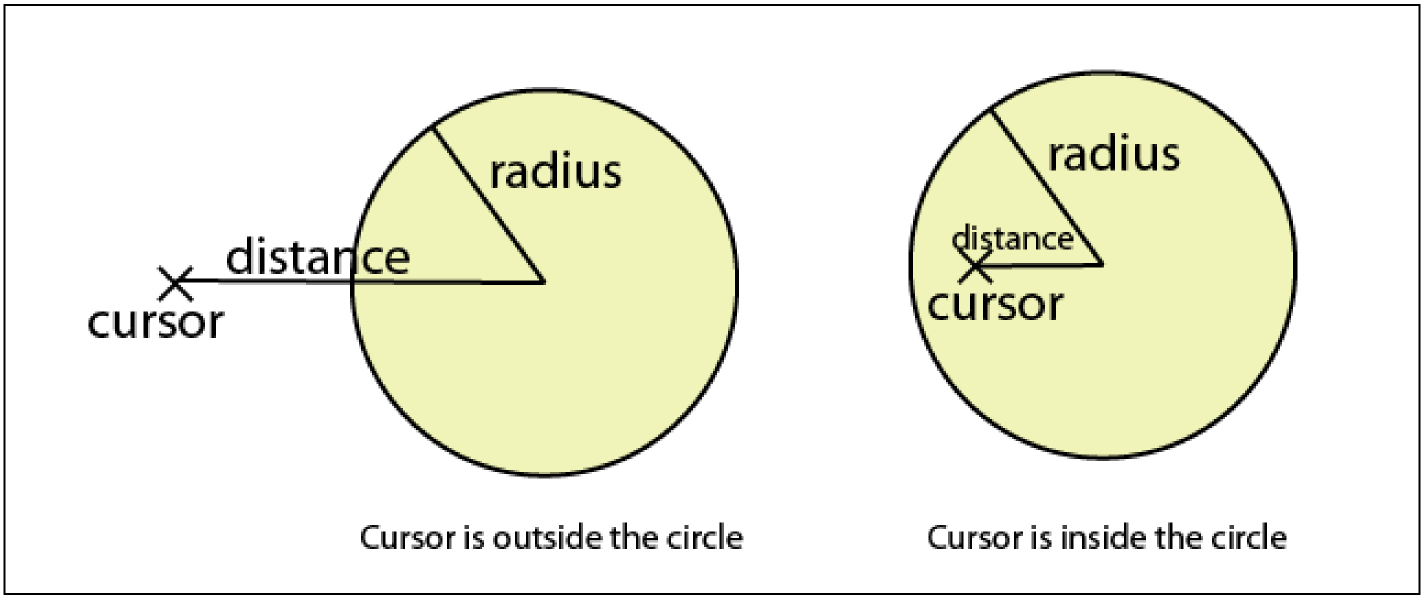


file:///Users/makzan/Dropbox/writings/HTML5
file:///Users/makzan/Dropbox/writings/HTML5

Drawing in Canvas

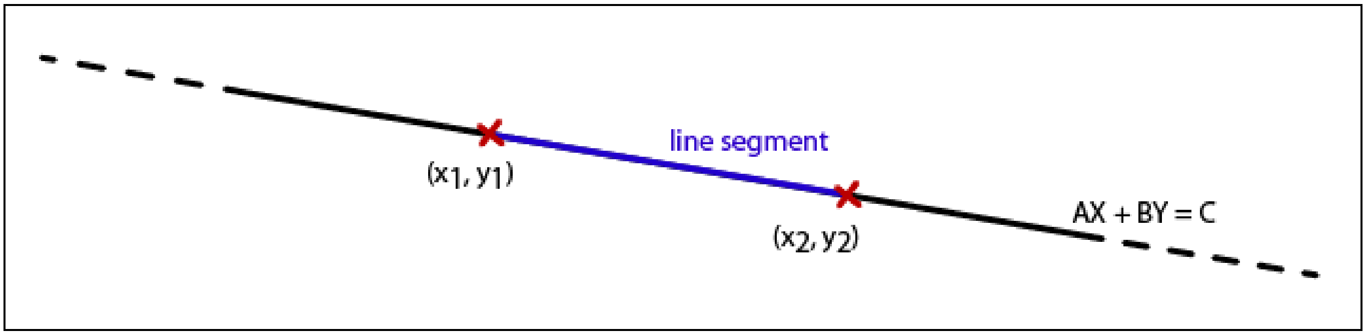
Drawing in Canvas

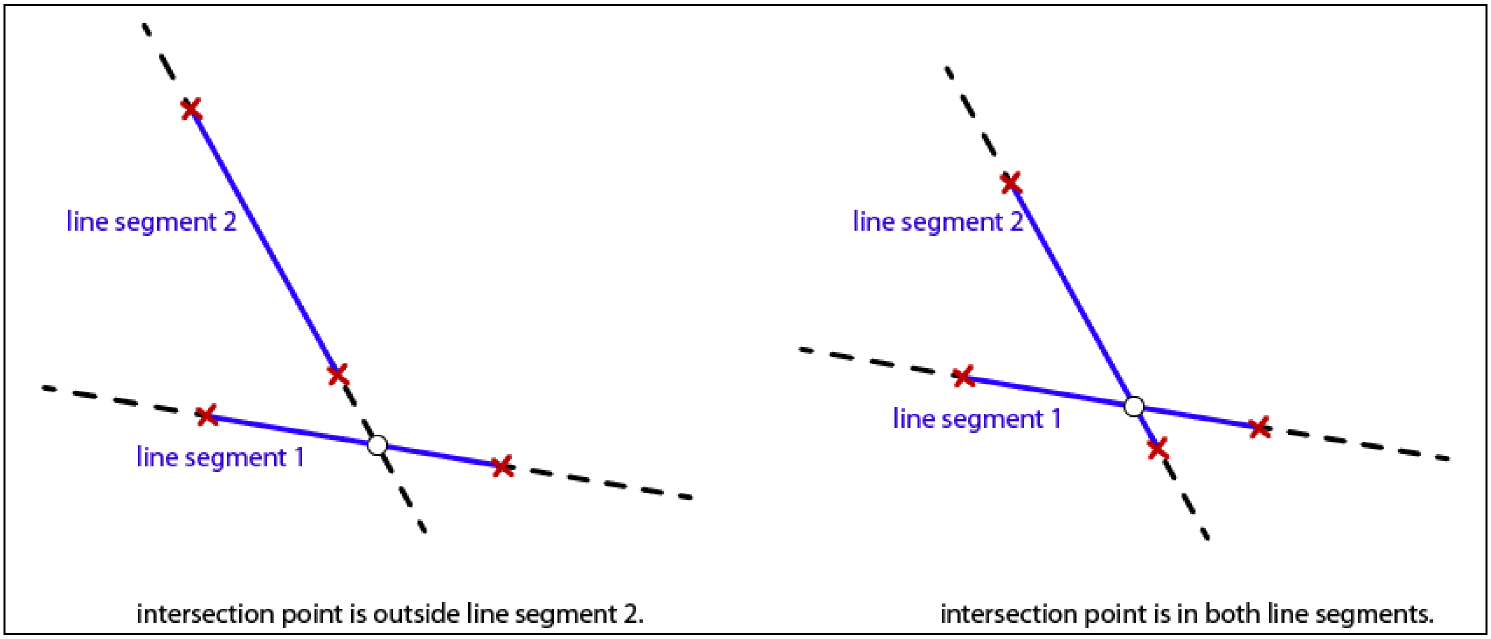
Detecting mouse events in circles in the Canvas



Detecting line intersection in Canvas

Determining whether two line segments intersect



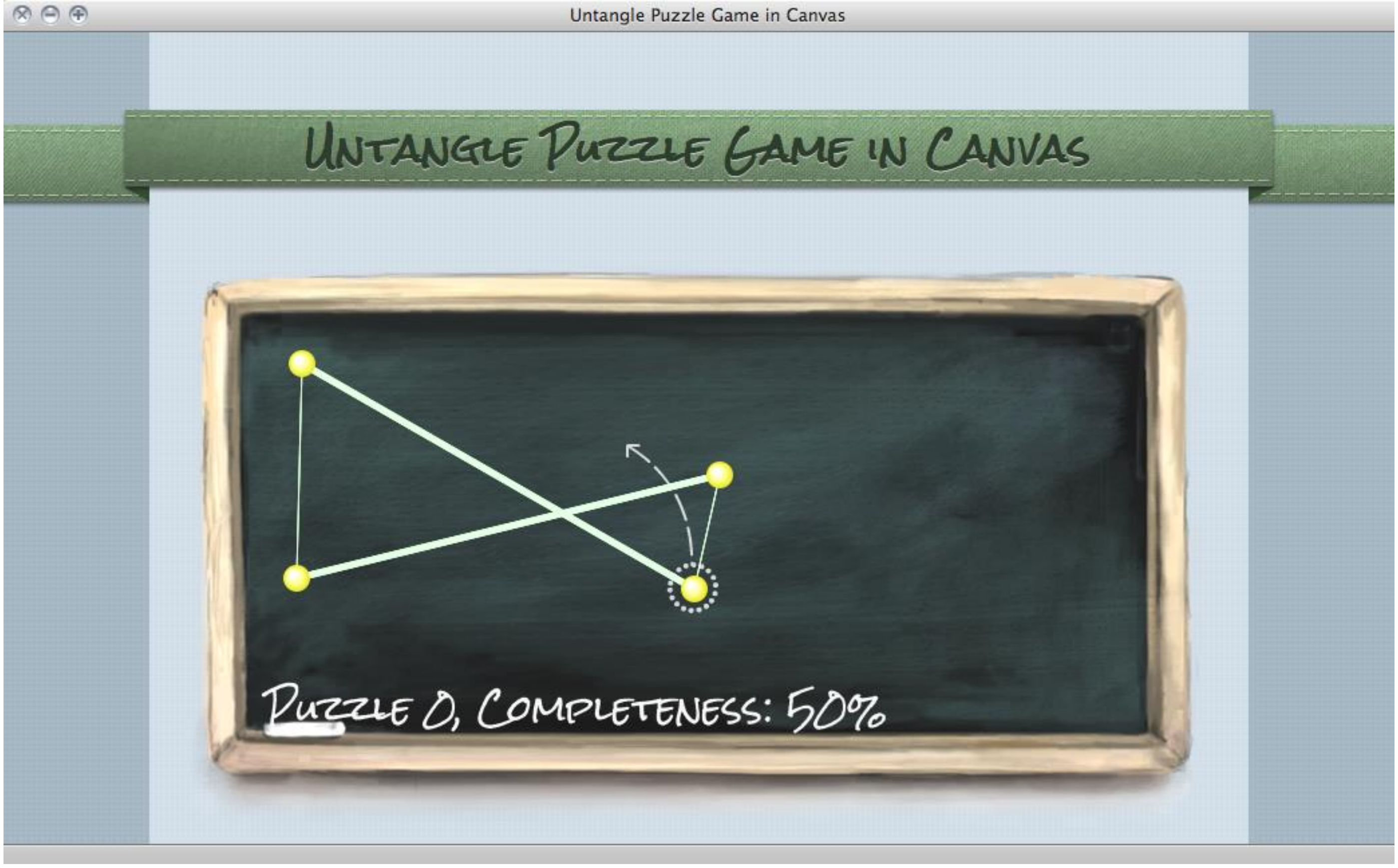


intersection point is outside line segment 2.

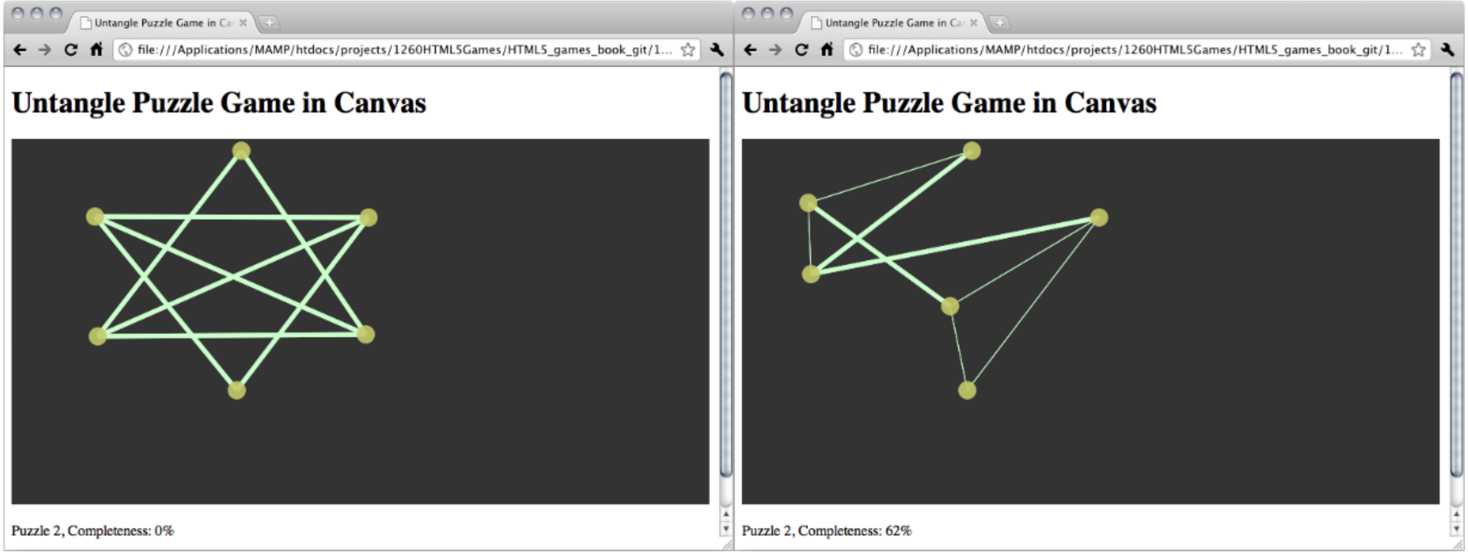
intersection point is in both line segments.

5

Building a Canvas Game's Masterclass


Untangle Puzzle Game in Canvas
Untangle Puzzle Game in Canvas
Puzzle 0, Completeness: 50%

Making the Untangle puzzle game

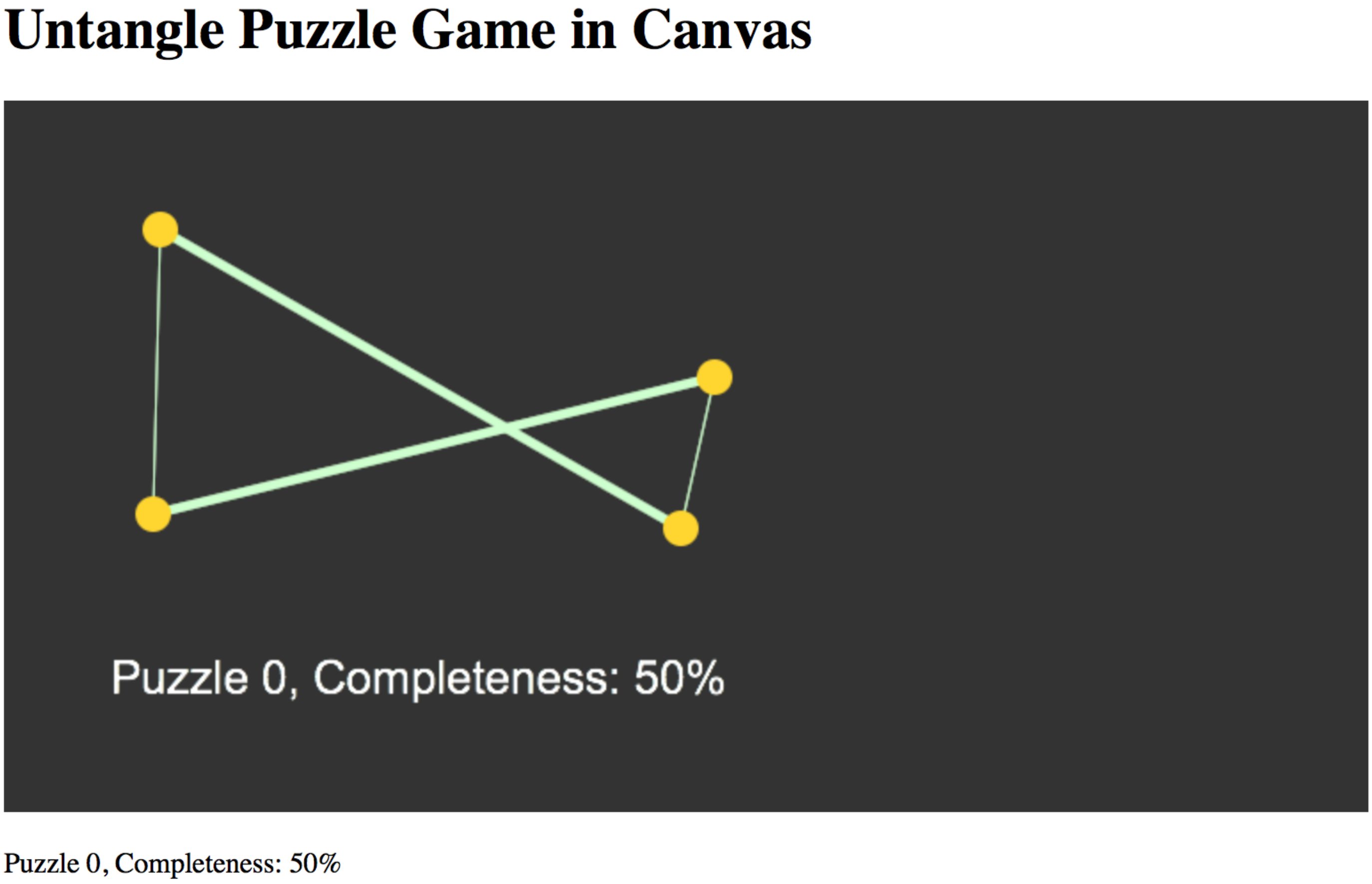

Untangle Puzzle Game in Ca
file:///Applications/MAMP/htdocs/projects/1260HTML5Games/HTML5_games_book_git/1...
Untangle Puzzle Game in Ca
file:///Applications/MAMP/htdocs/projects/1260HTML5Games/HTML5_games_book_git/1...

Untangle Puzzle Game in Canvas

Puzzle 2, Completeness: 0%

Untangle Puzzle Game in Canvas

Puzzle 2, Completeness: 62%

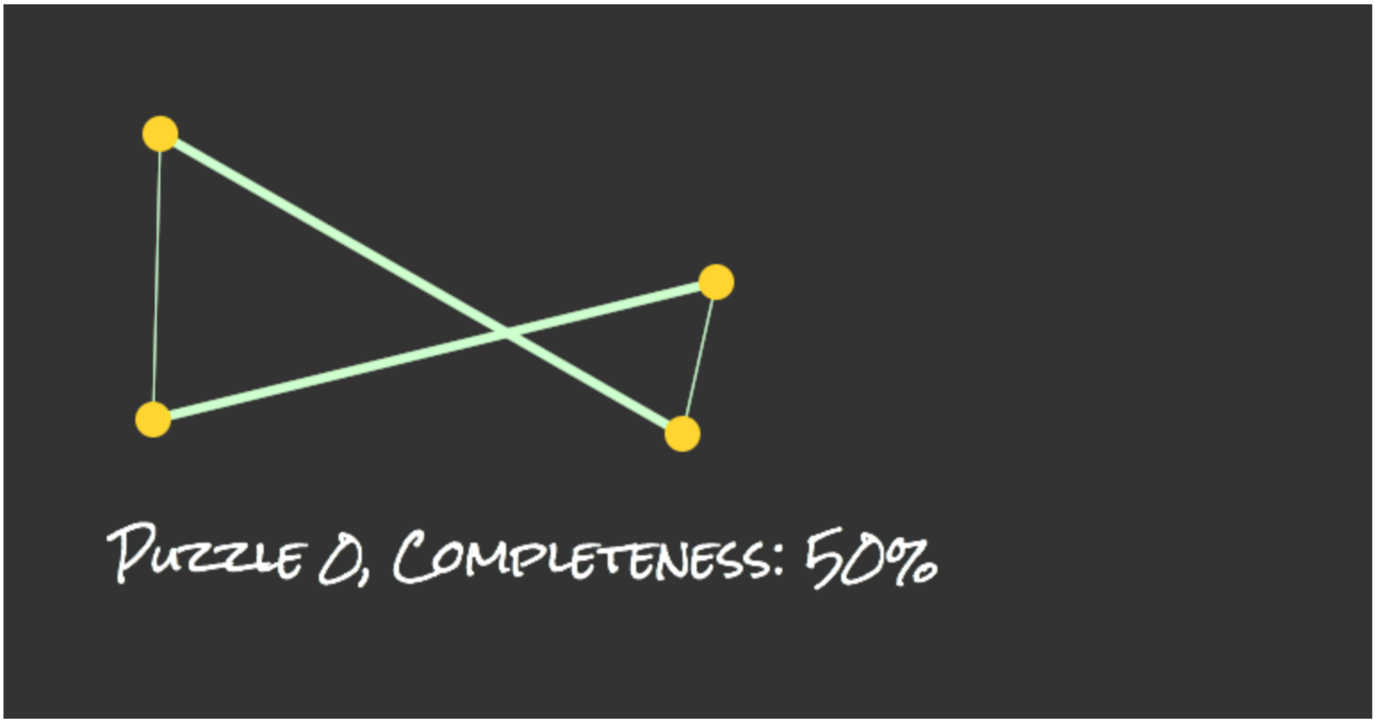


Untangle Puzzle Game in Canvas

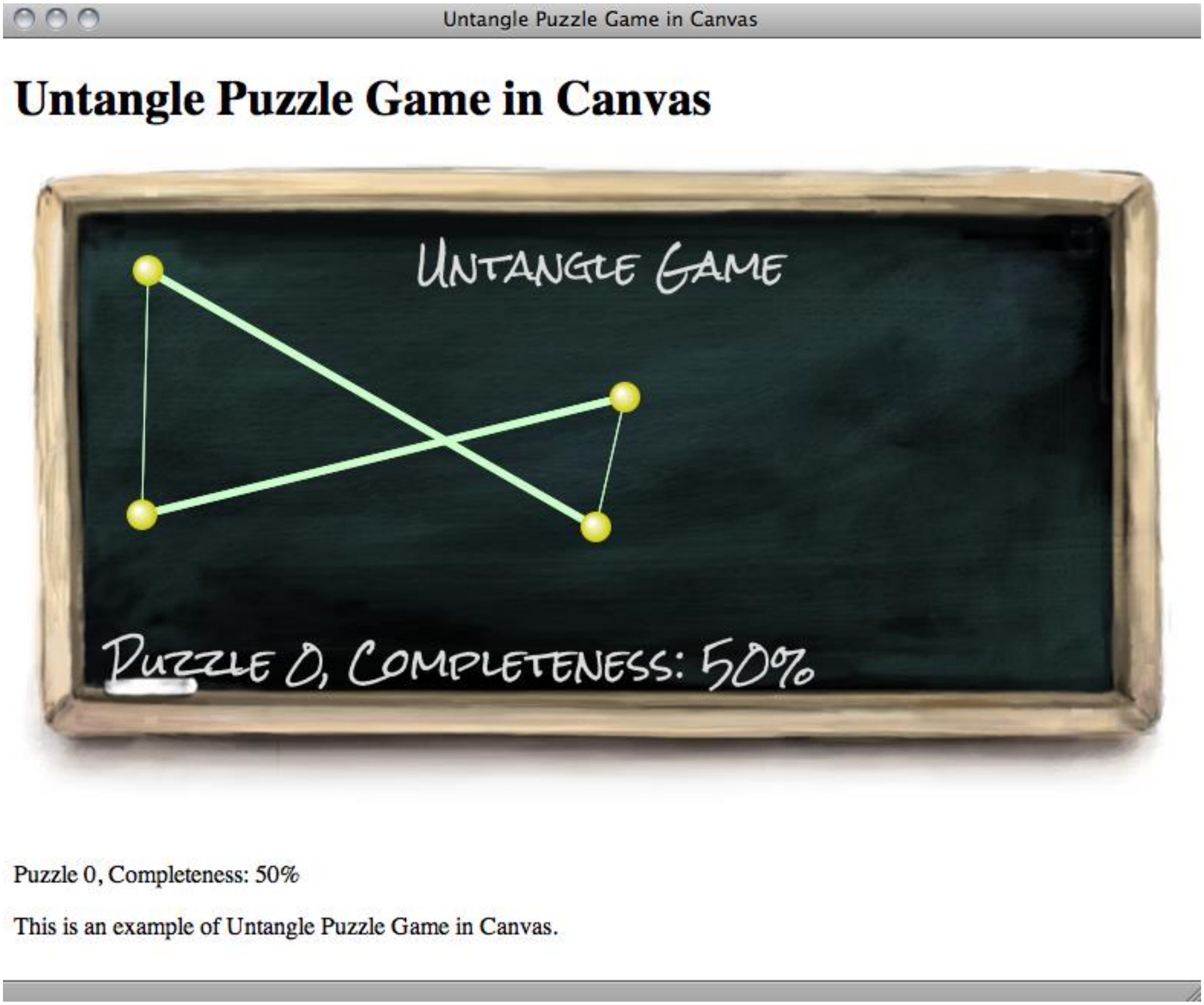
Puzzle 0, Completeness: 50%

Puzzle 0, Completeness: 50%

Using embedded web font inside the Canvas



Drawing images in the Canvas

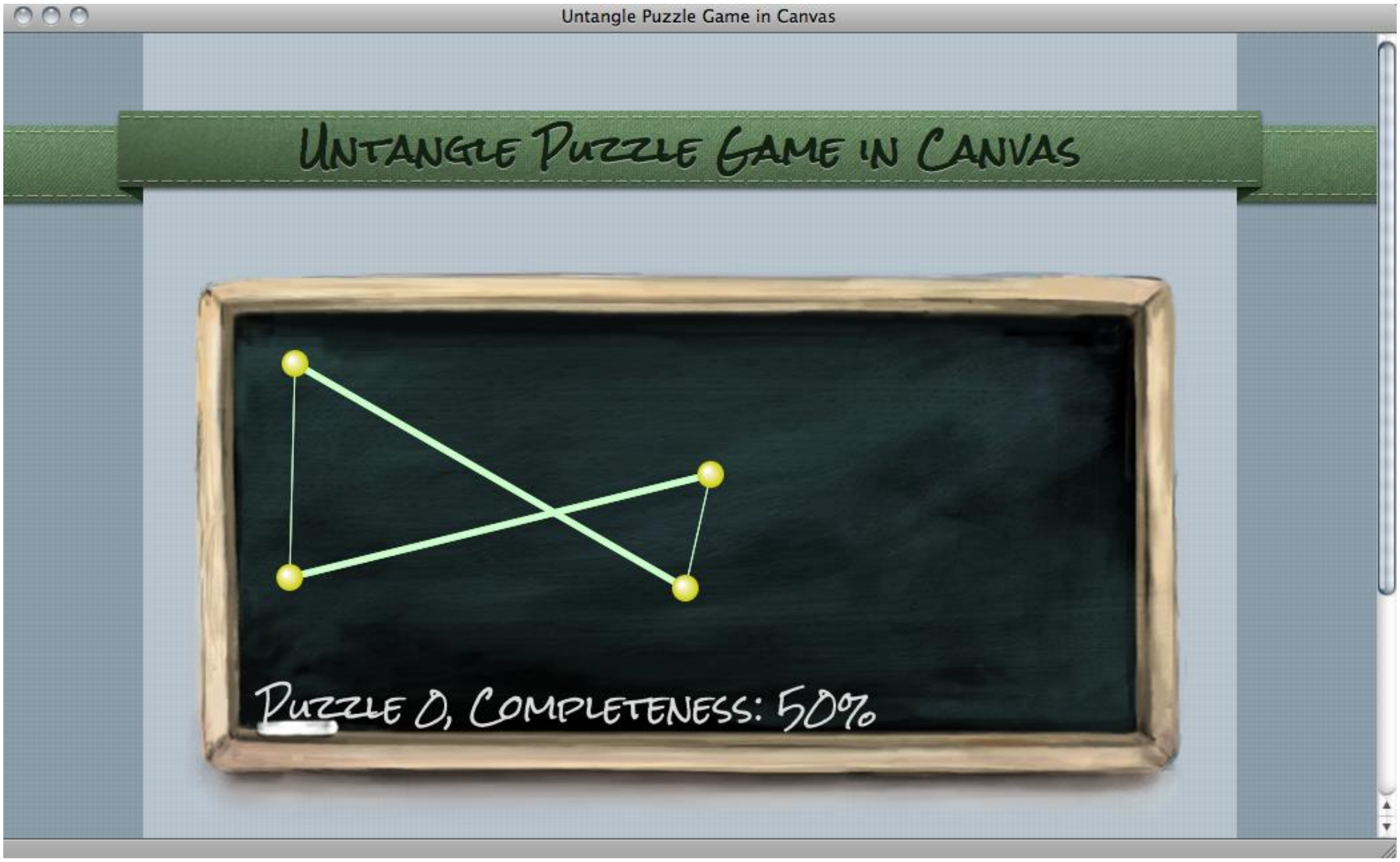


Untangle Puzzle Game in Canvas

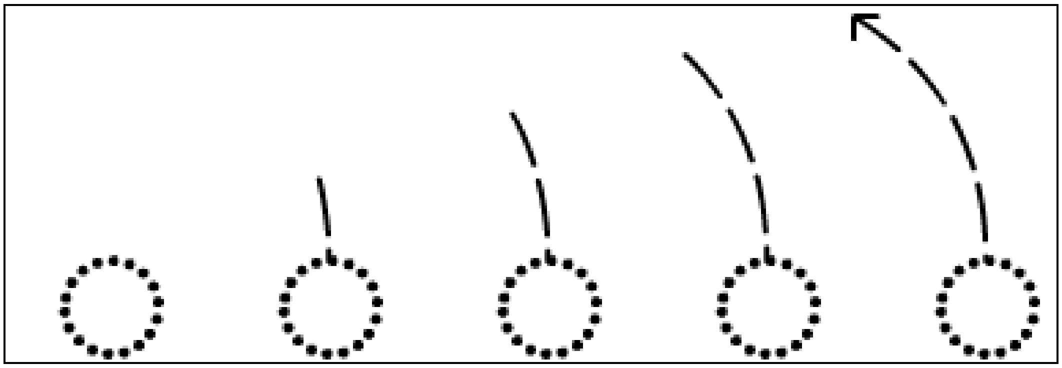
Puzzle 0, Completeness: 50%

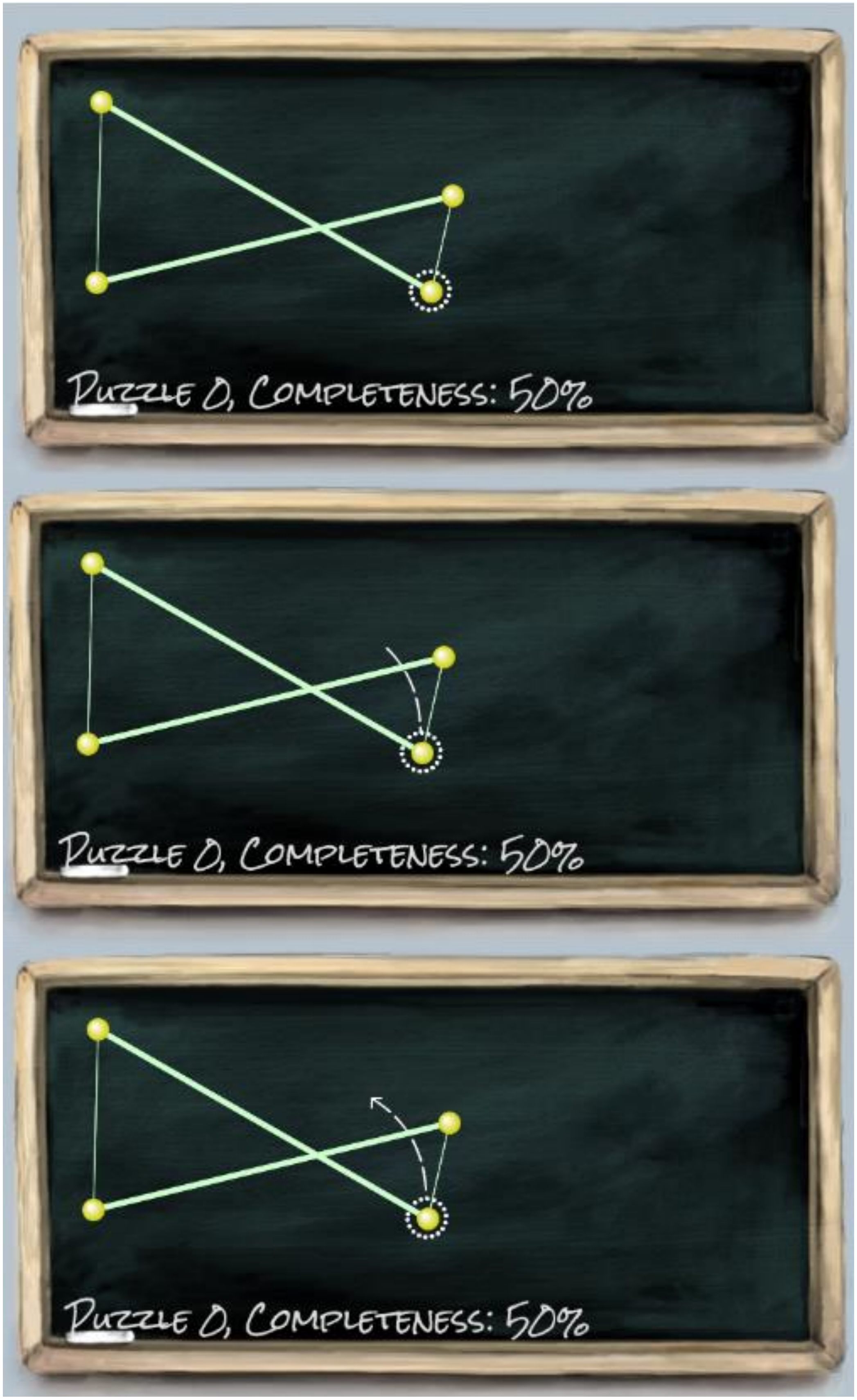
This is an example of Untangle Puzzle Game in Canvas.

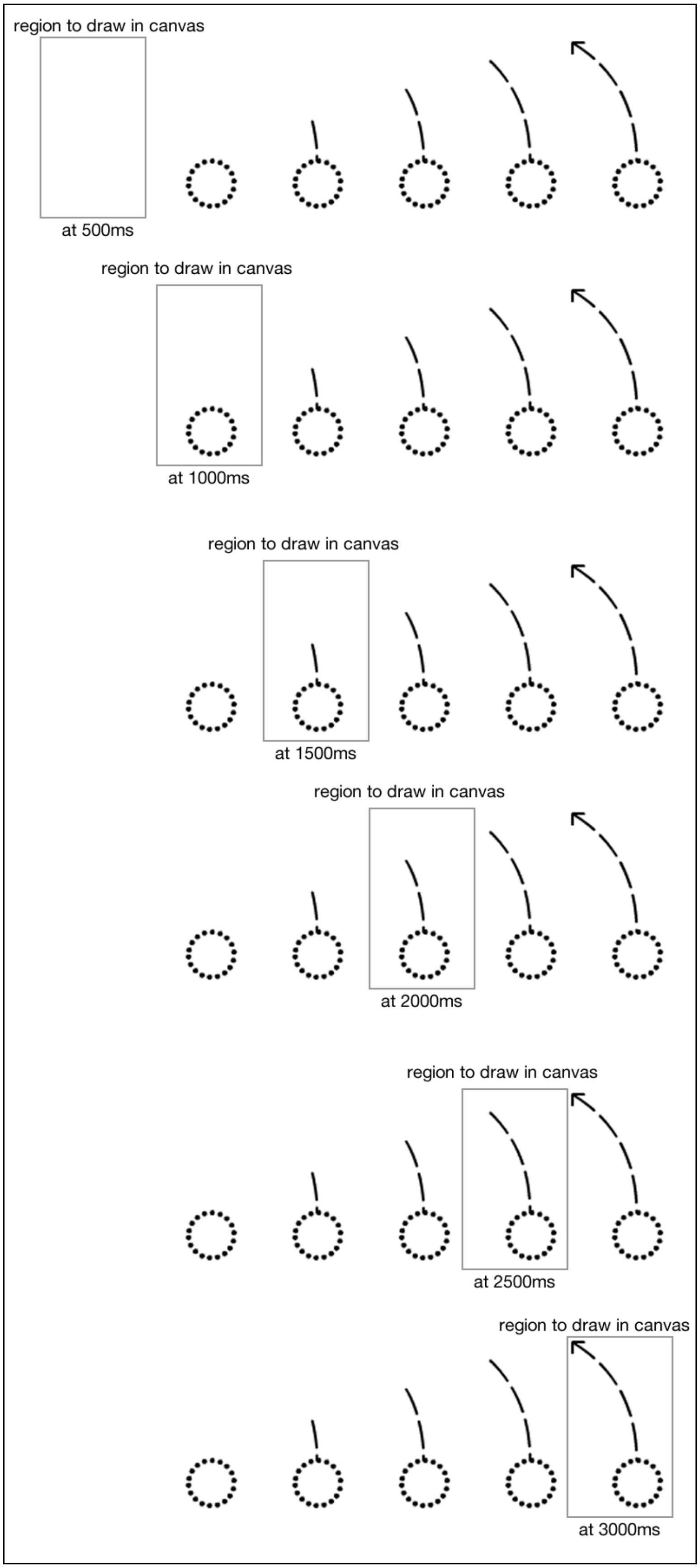
Decorating the Canvas-based game

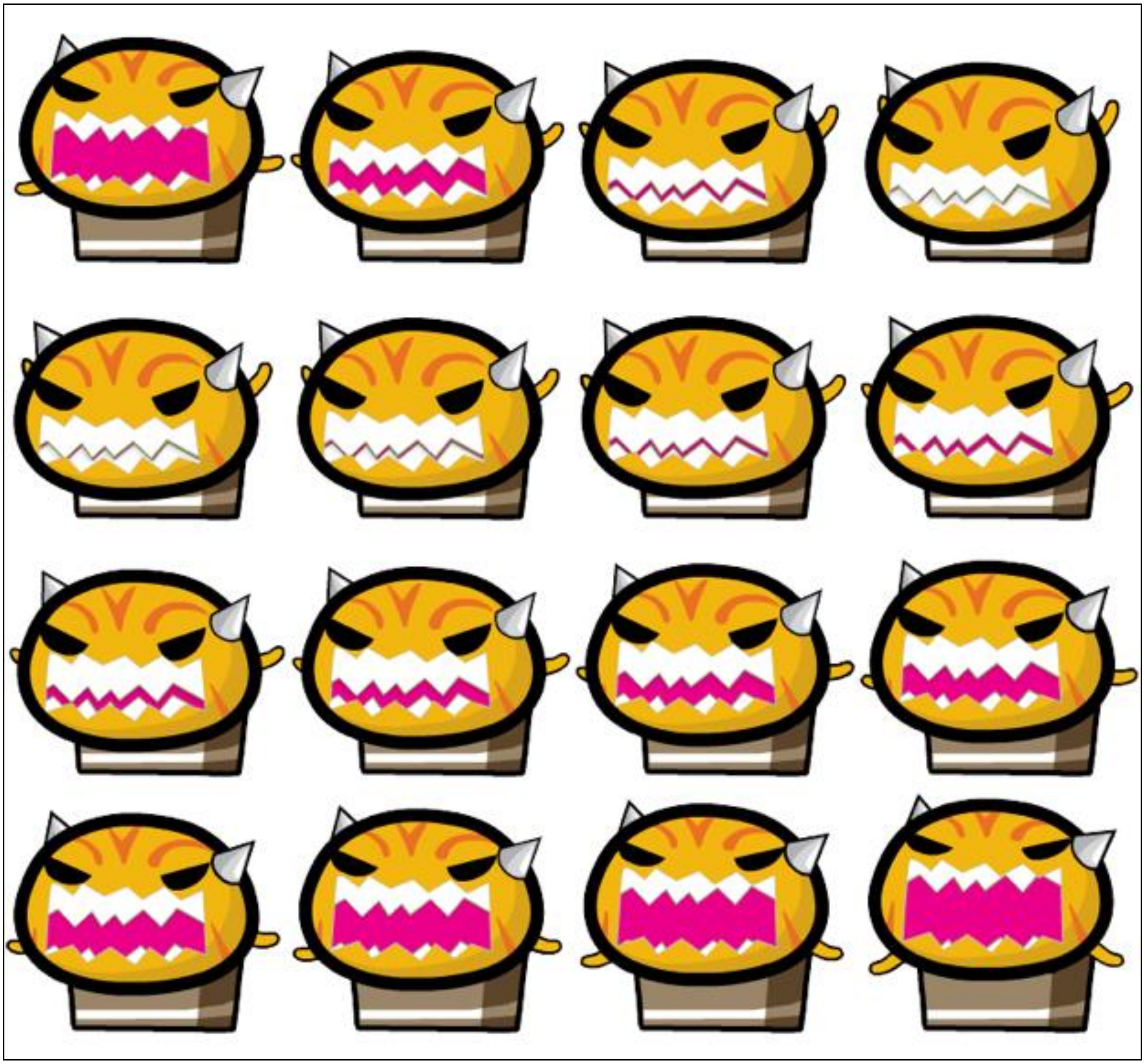

Untangle Puzzle Game in Canvas
Untangle Puzzle Game in Canvas
Puzzle 0, Completeness: 50%

Animating a sprite sheet in Canvas

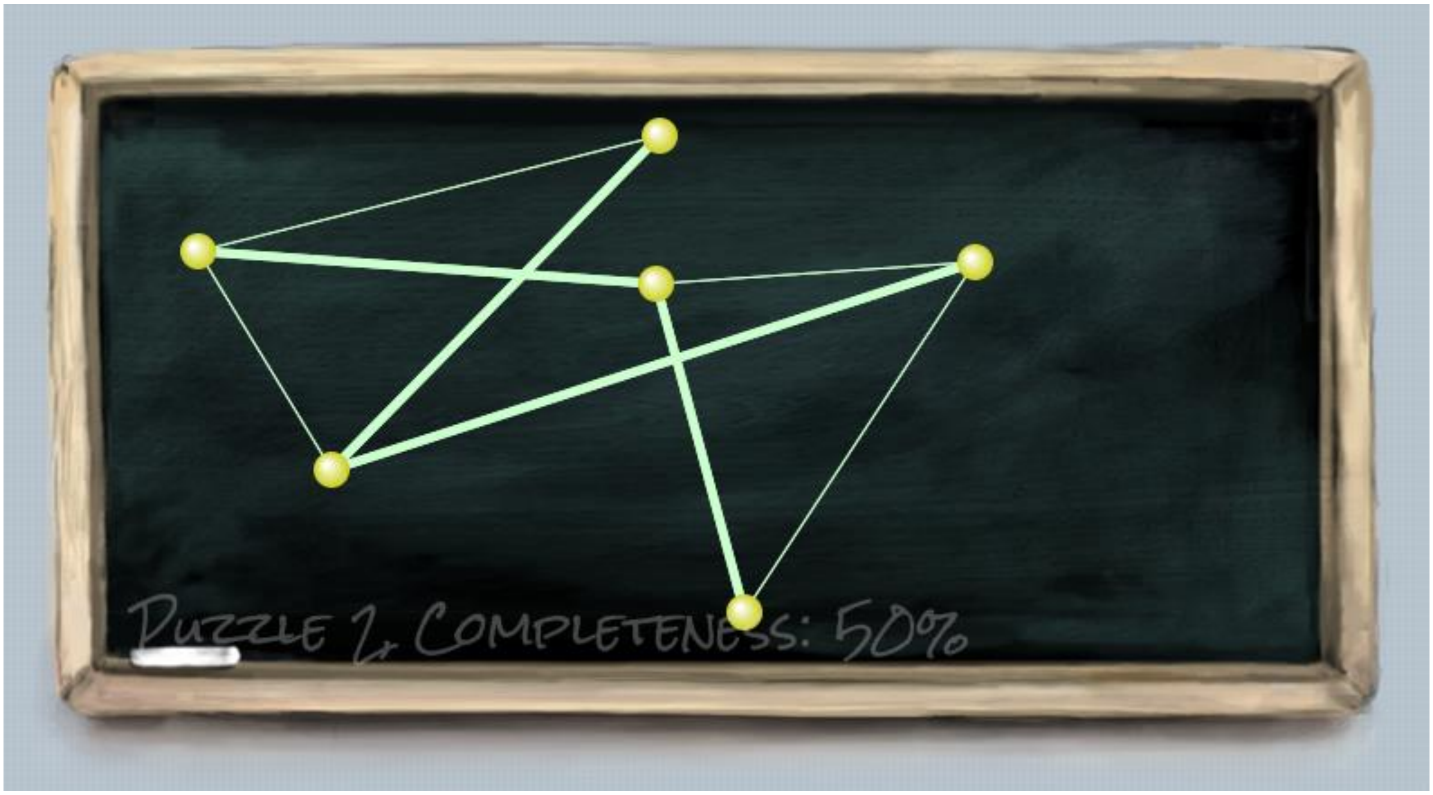


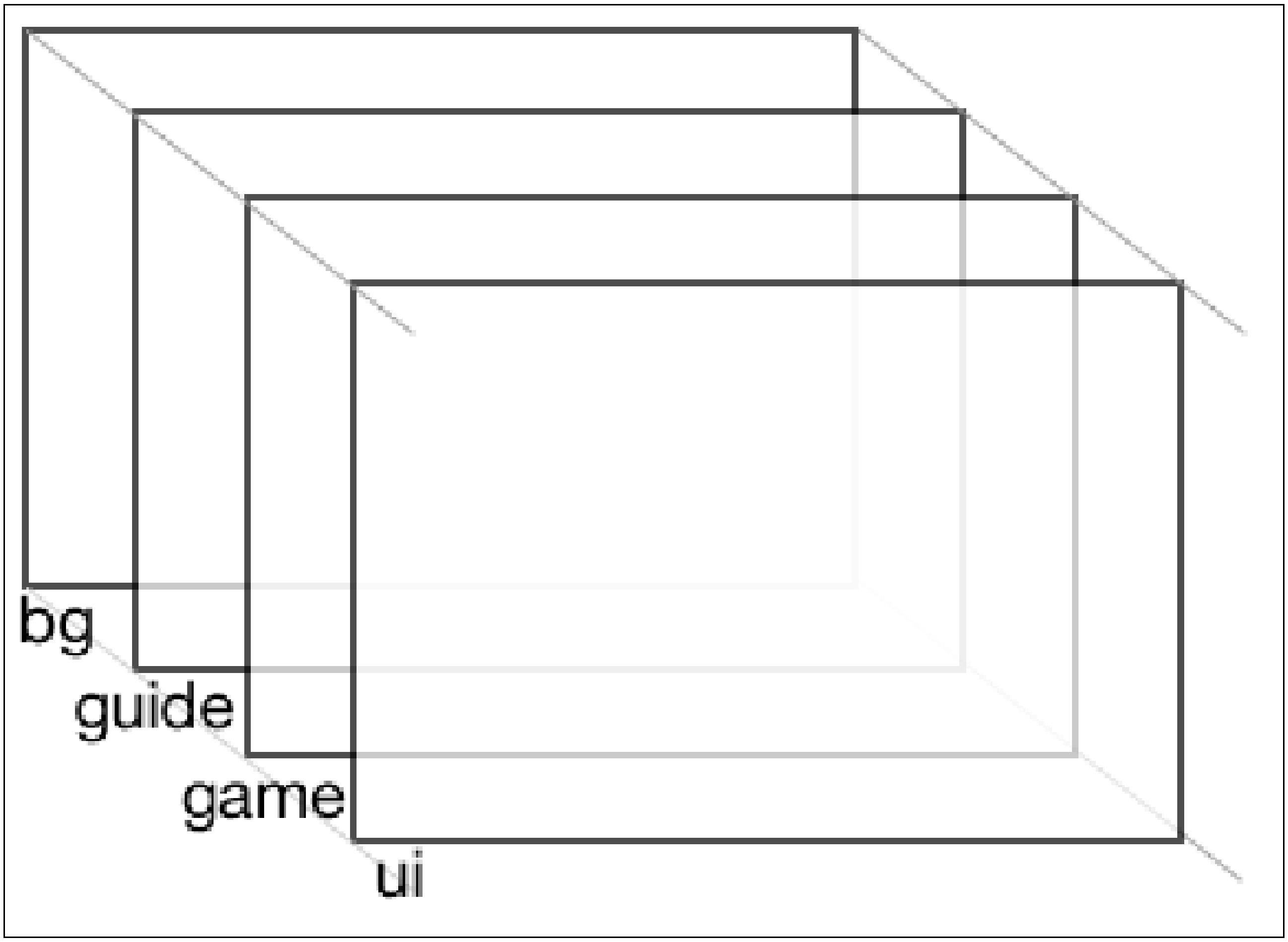

Puzzle 0, Completeness: 50%
Puzzle 0, Completeness: 50%
Puzzle 0, Completeness: 50%


region to draw in canvas
at 500ms
region to draw in canvas
at 1000ms
region to draw in canvas
at 1500ms
region to draw in canvas
at 2000ms
region to draw in canvas
at 2500ms
region to draw in canvas
at 3000ms



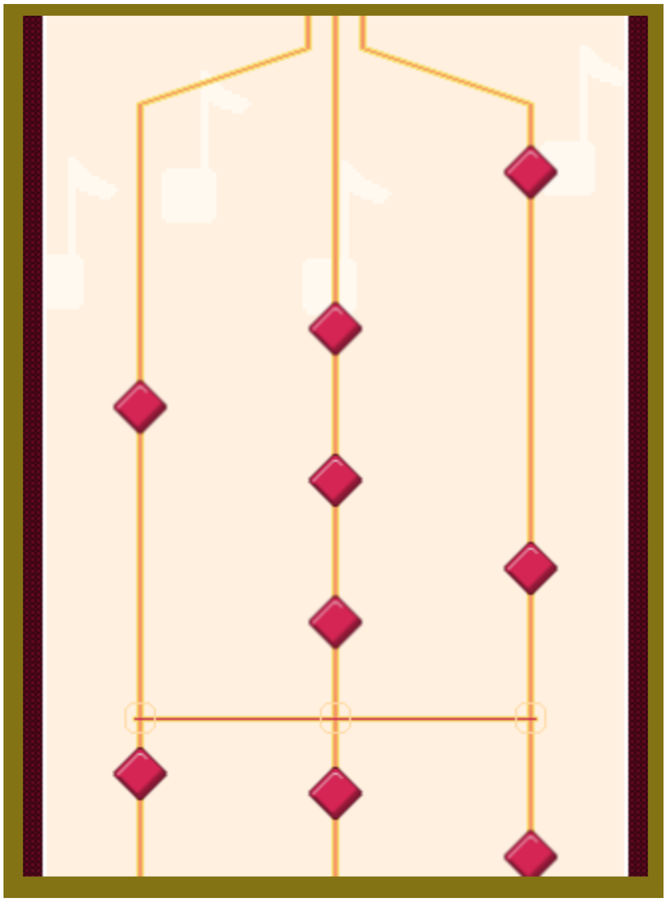
Creating a multi-layer Canvas game



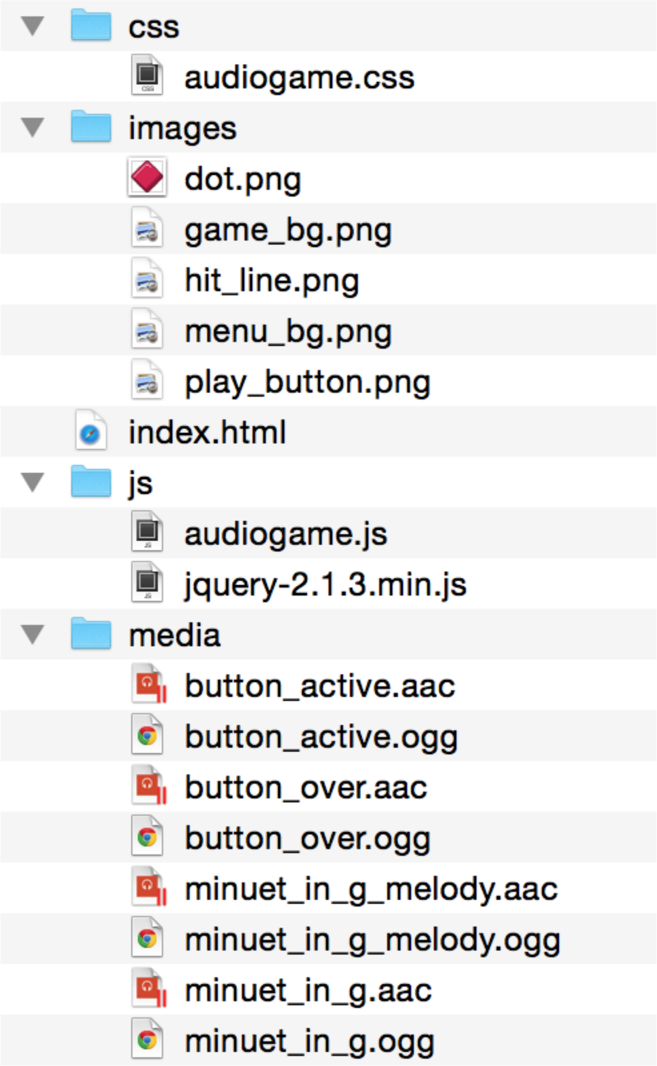

bg
guide
game
ui

6

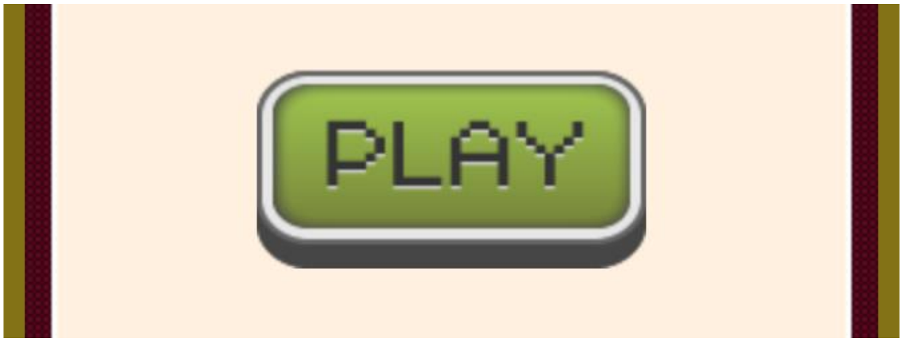
Adding Sound Effects to Your Games



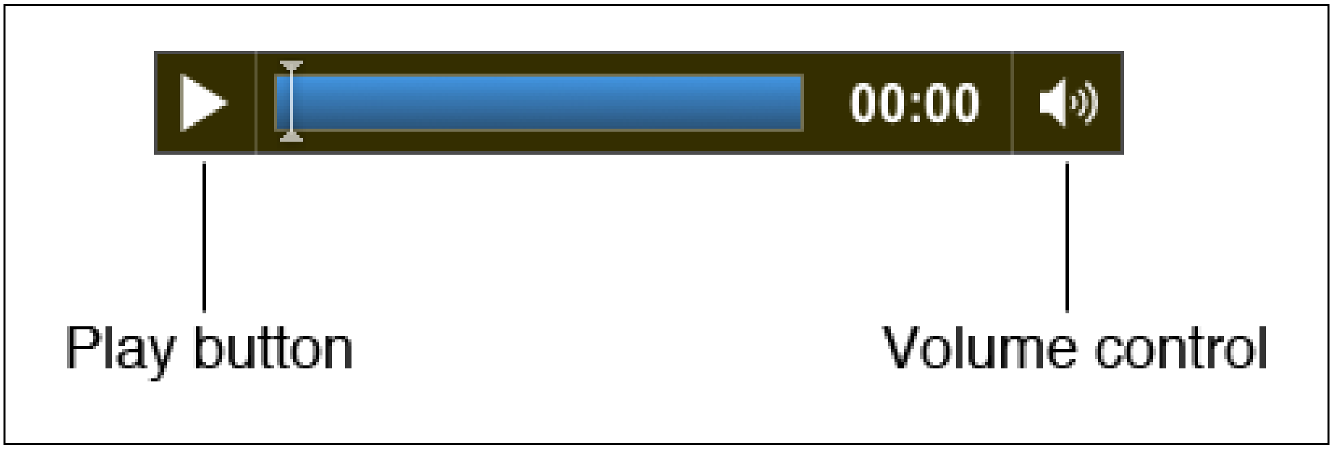
Adding a sound effect to the Play button



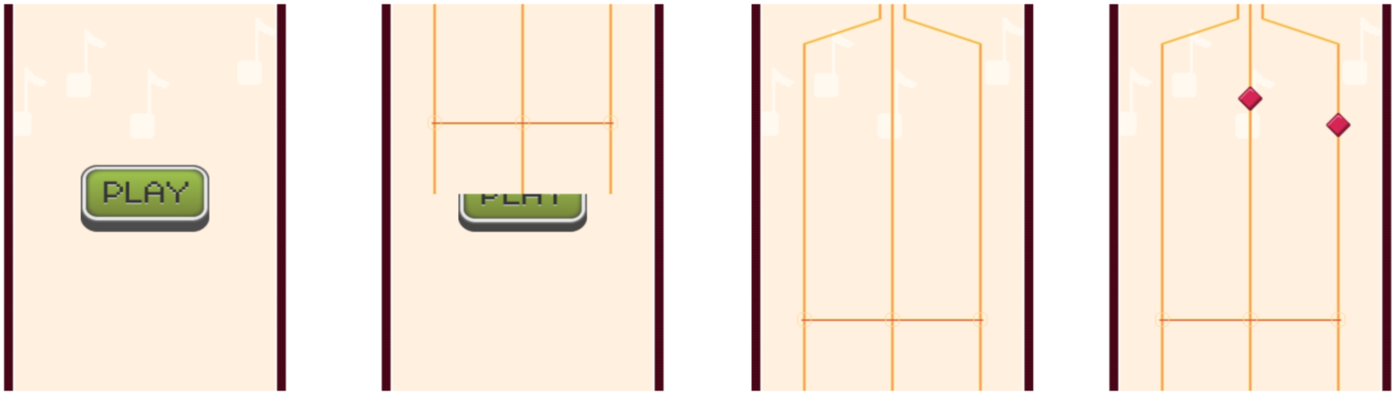
```
css
    audiogame.css
images
    dot.png
    game_bg.png
    hit_line.png
    menu_bg.png
    play_button.png
index.html
js
    audiogame.js
    jquery-2.1.3.min.js
media
    button_active.aac
    button_active.ogg
    button_over.aac
    button_over.ogg
    minuet_in_g_melody.aac
    minuet_in_g_melody.ogg
    minuet_in_g.aac
    minuet_in_g.ogg
```



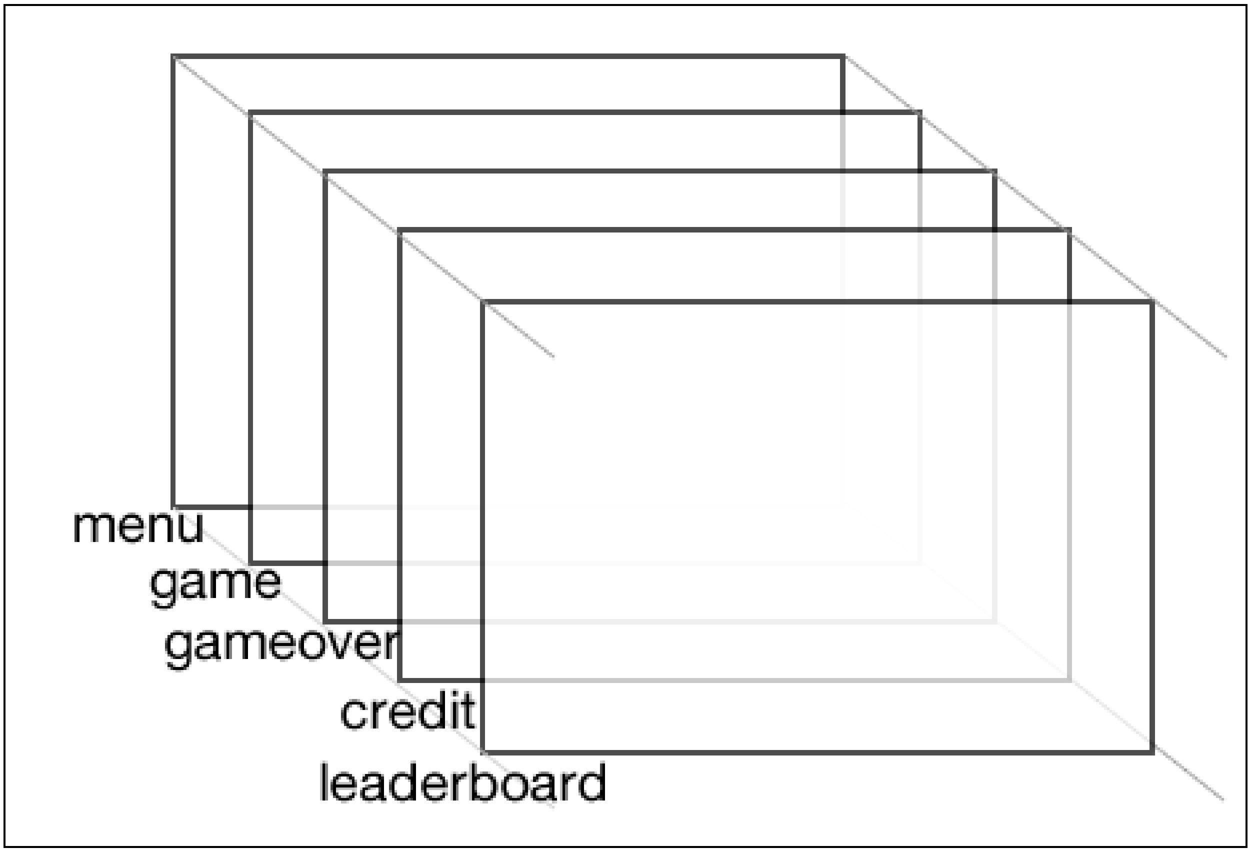
Defining an audio element



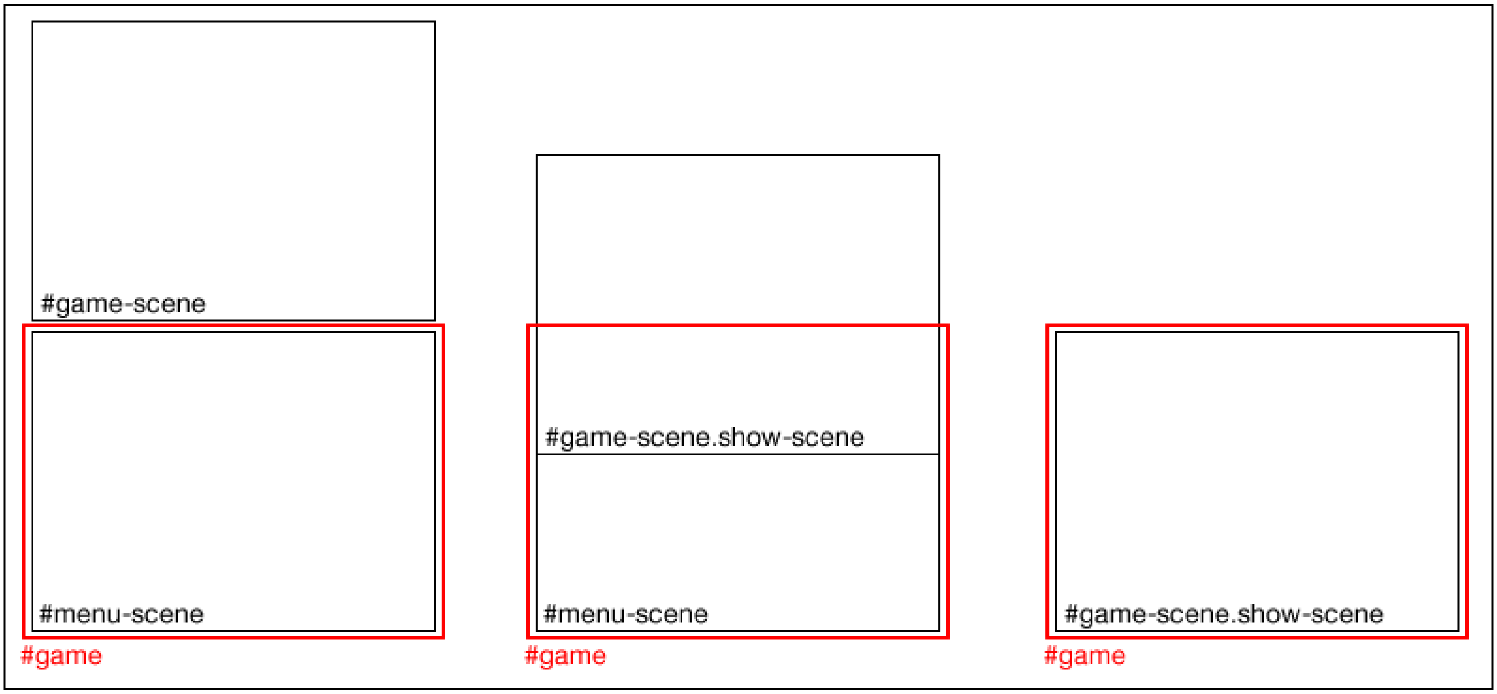
Building a mini piano musical game



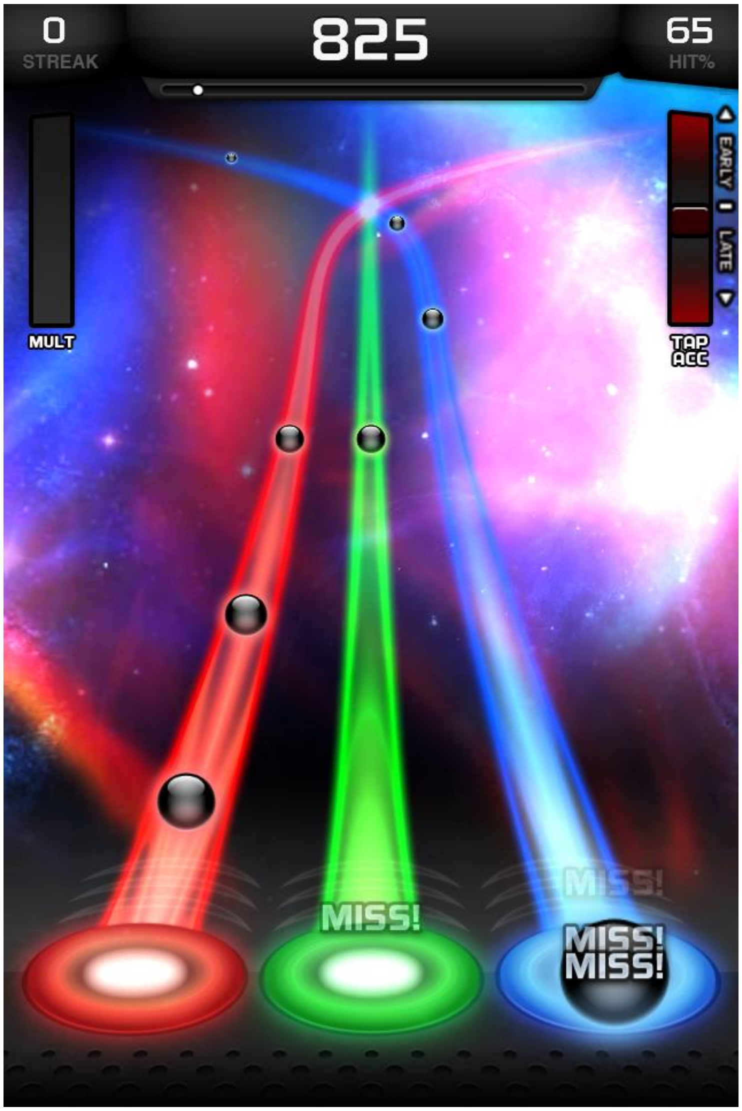
Creating scenes in games

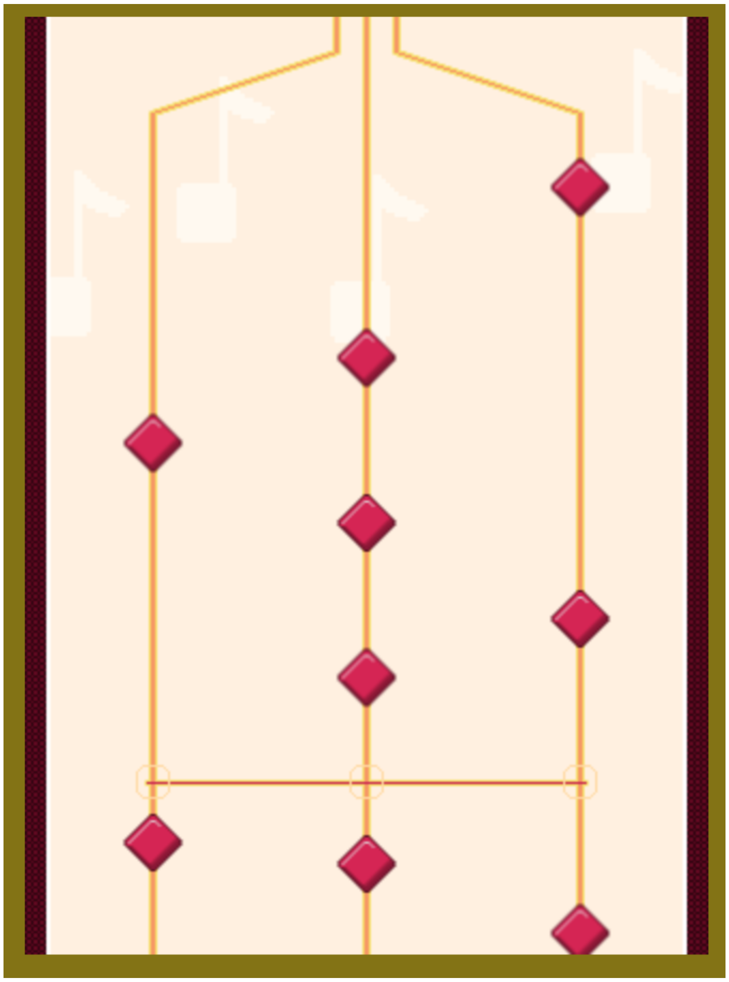


Creating a slide-in effect in CSS3

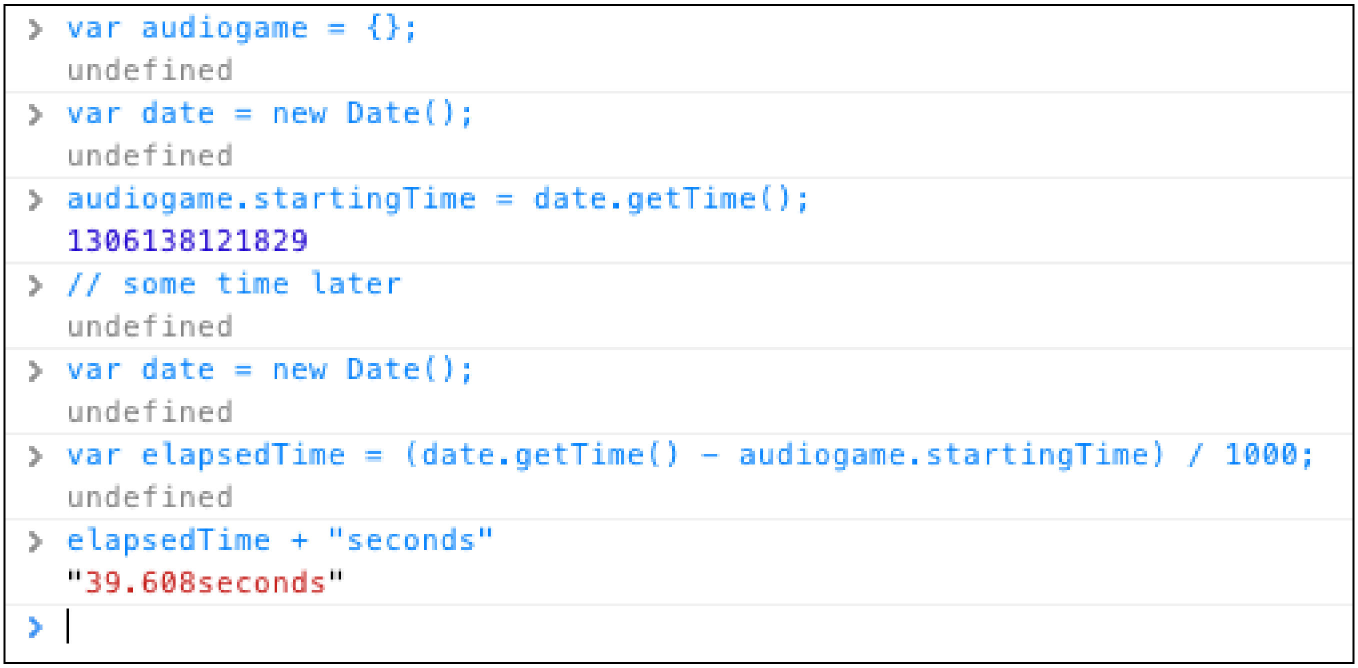


Visualizing the music playback



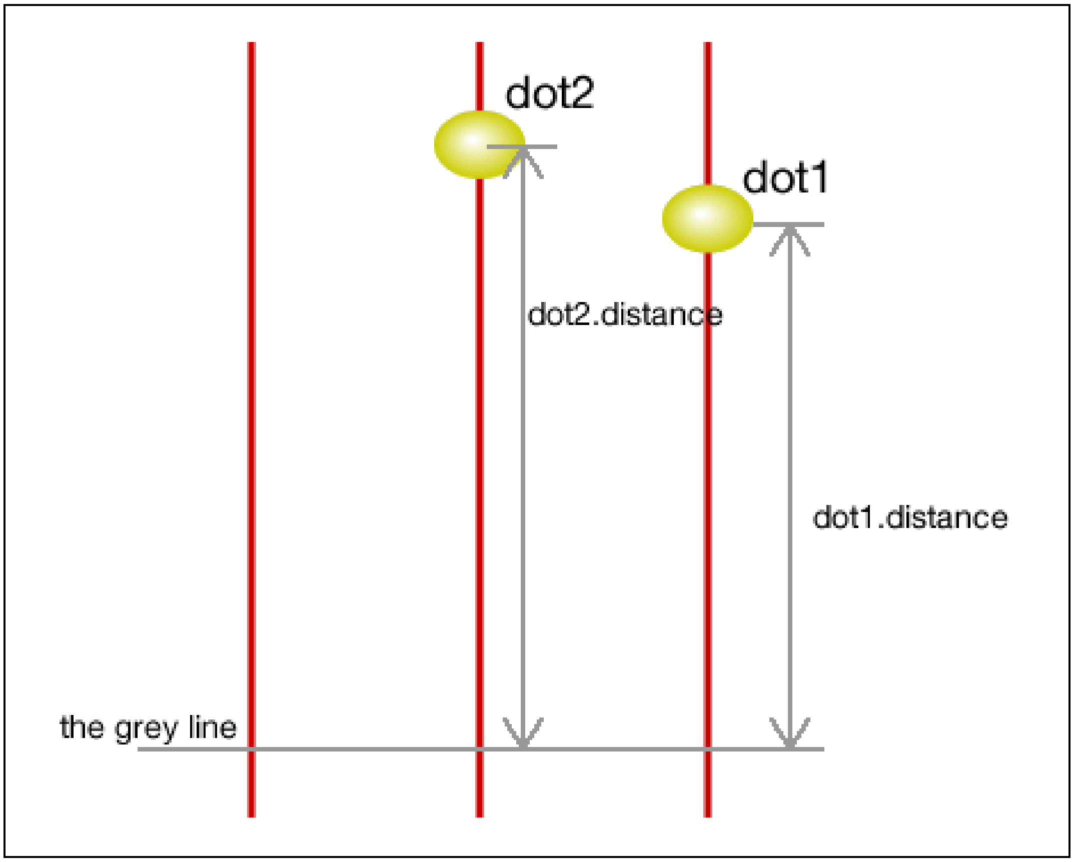


Getting the elapsed time of the game

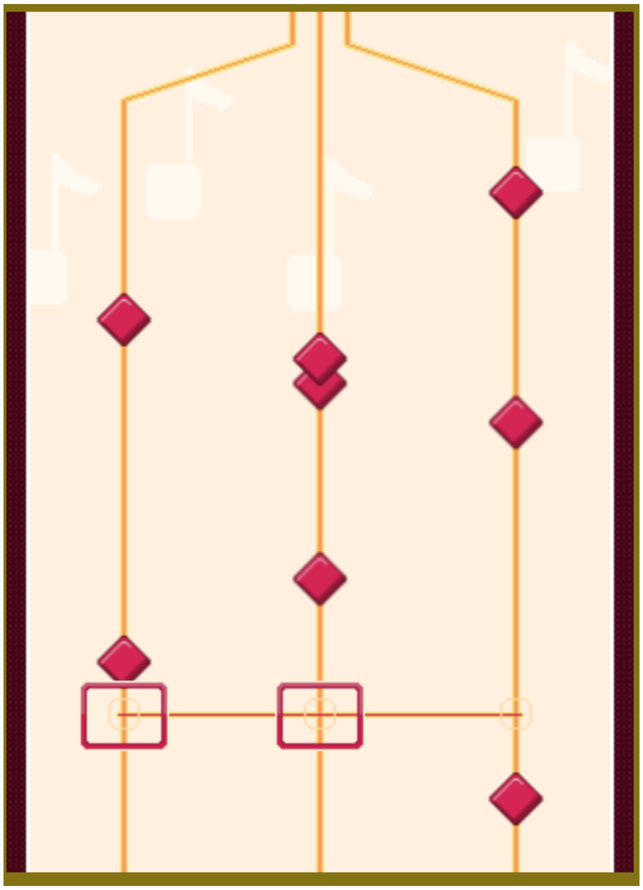


```
> var audiogame = {};
  undefined
> var date = new Date();
  undefined
> audiogame.startingTime = date.getTime();
  1306138121829
> // some time later
  undefined
> var date = new Date();
  undefined
> var elapsedTime = (date.getTime() - audiogame.startingTime) / 1000;
  undefined
> elapsedTime + "seconds"
  "39.608seconds"
> |
```

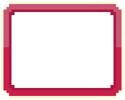
Moving the music dots



Creating a keyboard-driven mini piano musical game

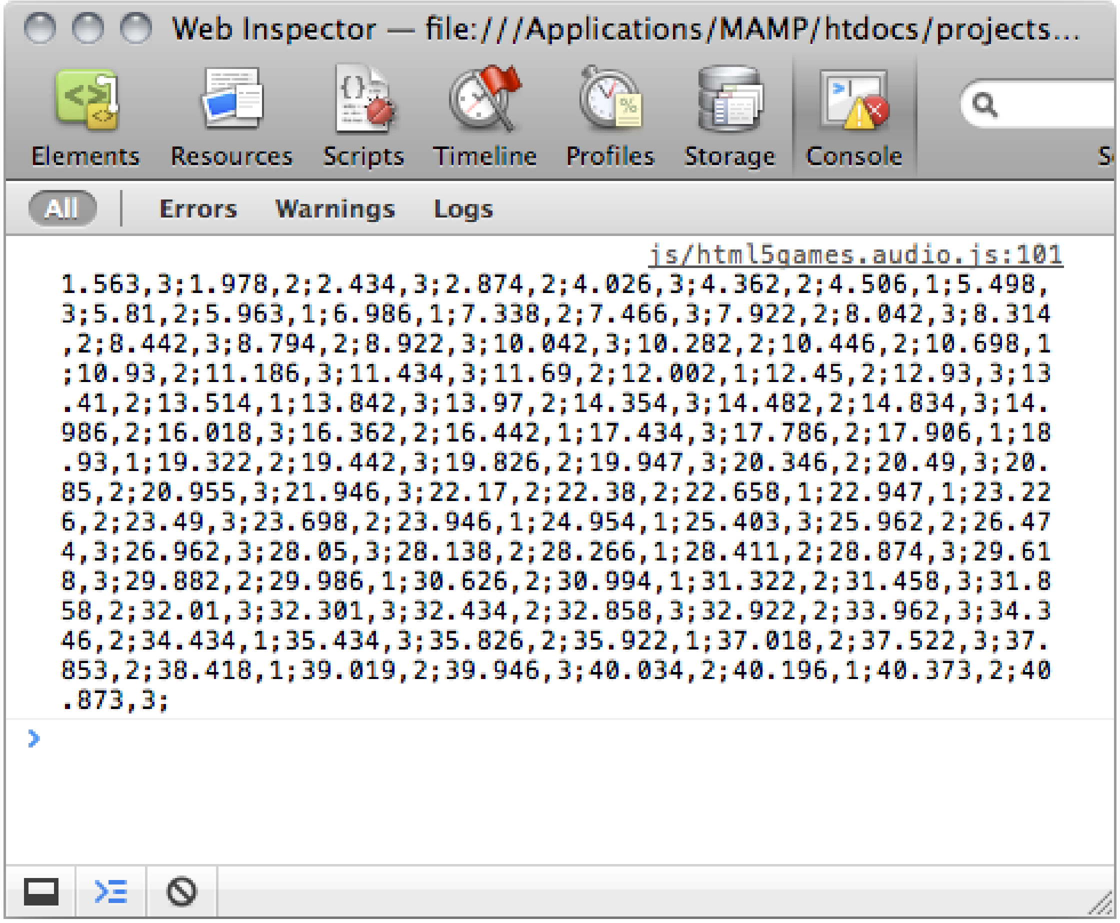


Hitting the three music lines by key down



Adding additional features to the mini piano game

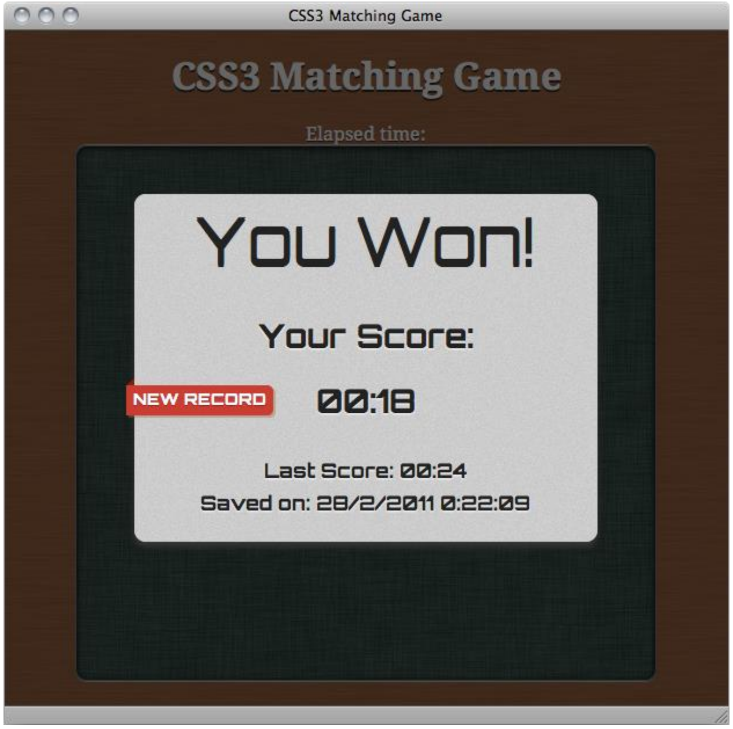
Recording music notes as level data



```
                                                    js/html5games.audio.js:101
1.563,3;1.978,2;2.434,3;2.874,2;4.026,3;4.362,2;4.506,1;5.498,
3;5.81,2;5.963,1;6.986,1;7.338,2;7.466,3;7.922,2;8.042,3;8.314
,2;8.442,3;8.794,2;8.922,3;10.042,3;10.282,2;10.446,2;10.698,1
;10.93,2;11.186,3;11.434,3;11.69,2;12.002,1;12.45,2;12.93,3;13
.41,2;13.514,1;13.842,3;13.97,2;14.354,3;14.482,2;14.834,3;14.
986,2;16.018,3;16.362,2;16.442,1;17.434,3;17.786,2;17.906,1;18
.93,1;19.322,2;19.442,3;19.826,2;19.947,3;20.346,2;20.49,3;20.
85,2;20.955,3;21.946,3;22.17,2;22.38,2;22.658,1;22.947,1;23.22
6,2;23.49,3;23.698,2;23.946,1;24.954,1;25.403,3;25.962,2;26.47
4,3;26.962,3;28.05,3;28.138,2;28.266,1;28.411,2;28.874,3;29.61
8,3;29.882,2;29.986,1;30.626,2;30.994,1;31.322,2;31.458,3;31.8
58,2;32.01,3;32.301,3;32.434,2;32.858,3;32.922,2;33.962,3;34.3
46,2;34.434,1;35.434,3;35.826,2;35.922,1;37.018,2;37.522,3;37.
853,2;38.418,1;39.019,2;39.946,3;40.034,2;40.196,1;40.373,2;40
.873,3;
>
```

7

Saving the Game's progress



CSS3 Matching Game

CSS3 Matching Game

Elapsed time:

You Won!

Your Score:

NEW RECORD

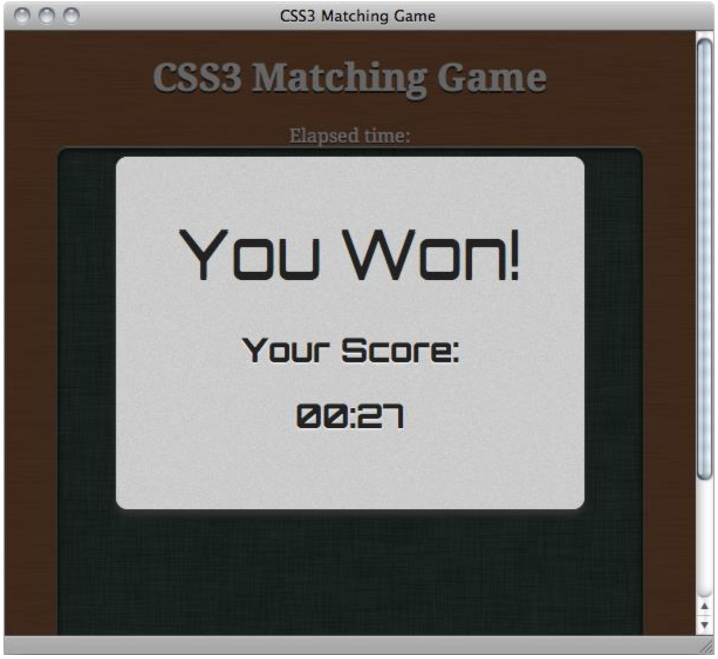
00:18

Last Score: 00:24

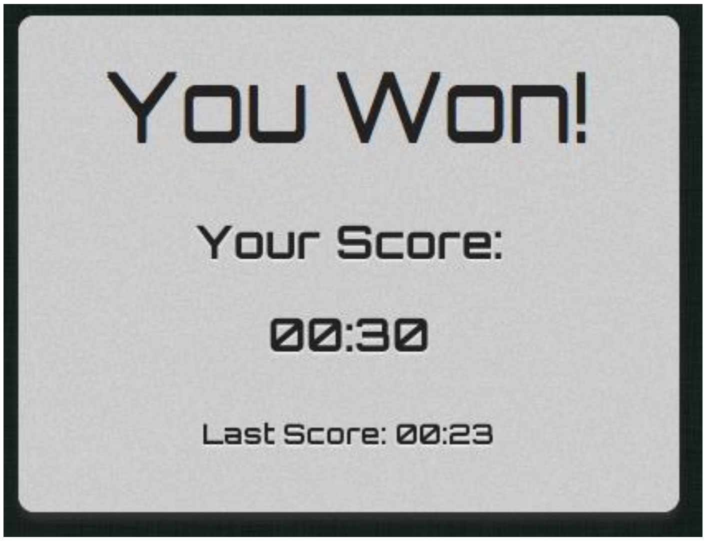
Saved on: 28/2/2011 0:22:09

Storing data using HTML5 local storage

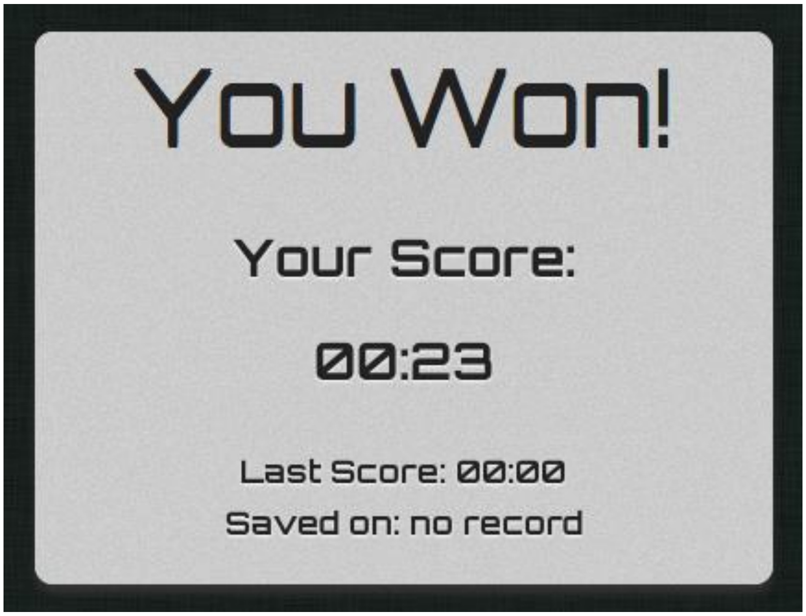
Creating a game over dialog



Saving scores in the browser



Saving objects in the local storage



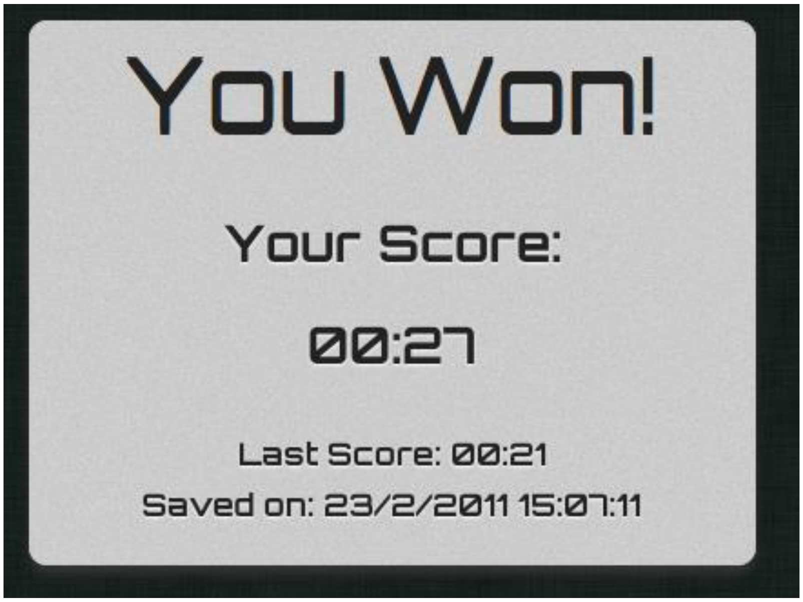
You Won!

Your Score:

00:23

Last Score: 00:00

Saved on: no record



You Won!

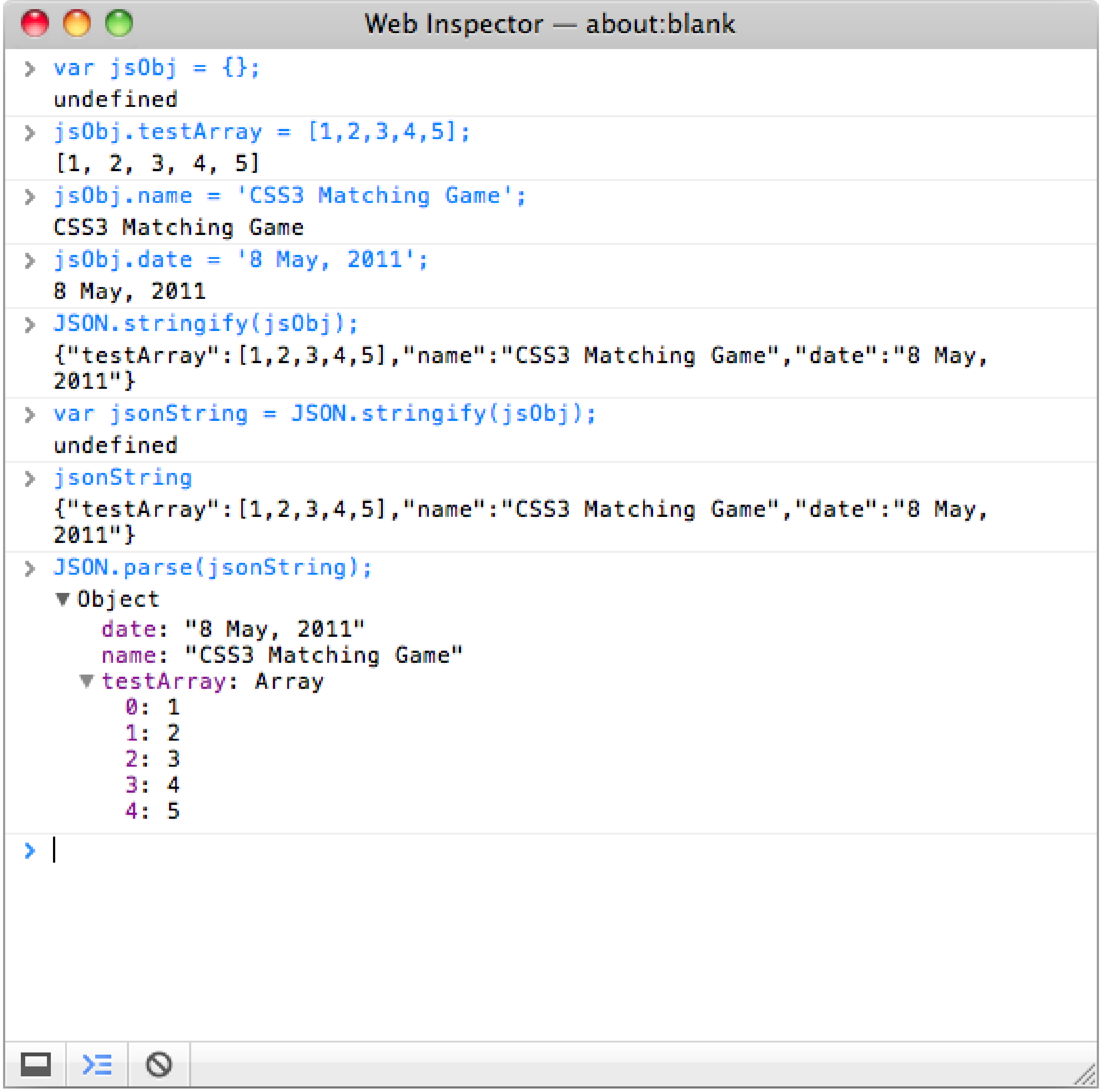
Your Score:

00:27

Last Score: 00:21

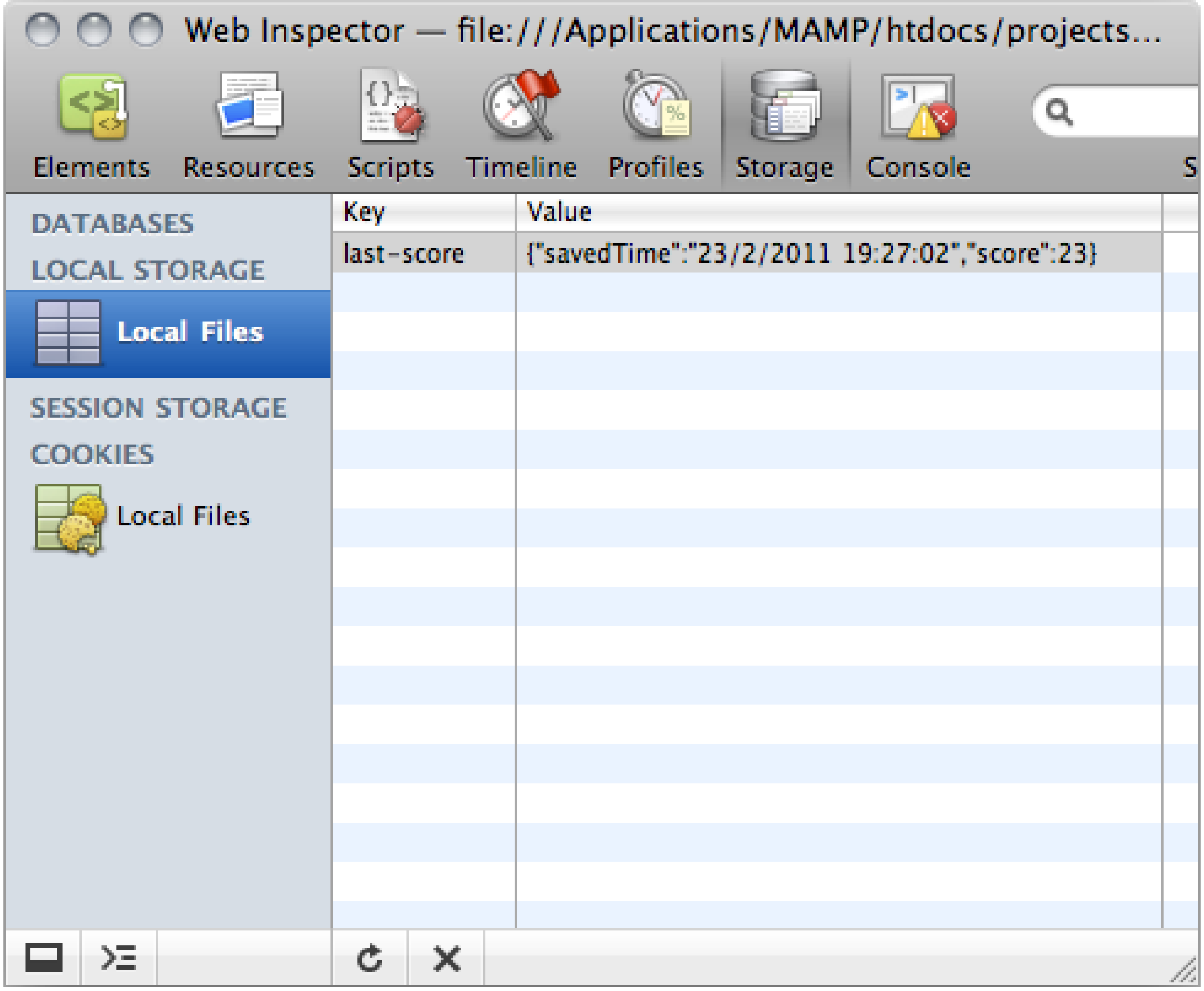
Saved on: 23/2/2011 15:07:11

Loading a stored object from a JSON string



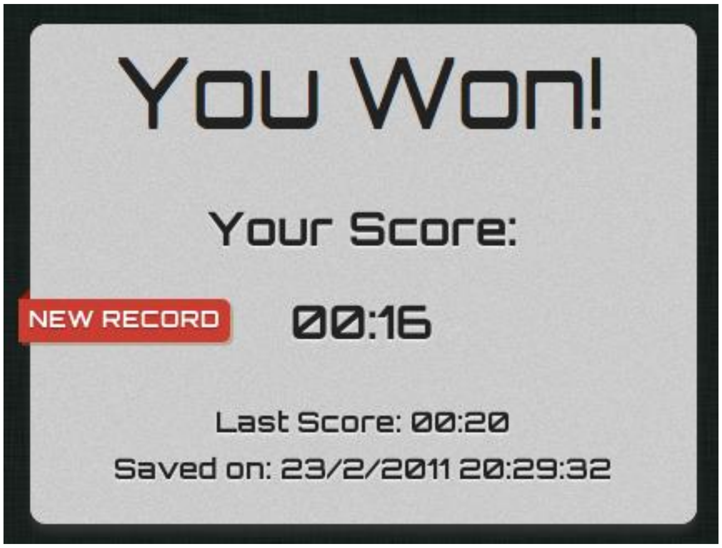
```
> var jsObj = {};
  undefined
> jsObj.testArray = [1,2,3,4,5];
  [1, 2, 3, 4, 5]
> jsObj.name = 'CSS3 Matching Game';
  CSS3 Matching Game
> jsObj.date = '8 May, 2011';
  8 May, 2011
> JSON.stringify(jsObj);
  {"testArray":[1,2,3,4,5],"name":"CSS3 Matching Game","date":"8 May,
  2011"}
> var jsonString = JSON.stringify(jsObj);
  undefined
> jsonString
  {"testArray":[1,2,3,4,5],"name":"CSS3 Matching Game","date":"8 May,
  2011"}
> JSON.parse(jsonString);
  ▼Object
      date: "8 May, 2011"
      name: "CSS3 Matching Game"
    ▼testArray: Array
        0: 1
        1: 2
        2: 3
        3: 4
        4: 5
> |
```

Inspecting the local storage in a console window



Key	Value
last-score	{"savedTime":"23/2/2011 19:27:02","score":23}

Notifying players when they break a new record with a nice ribbon effect



You Won!

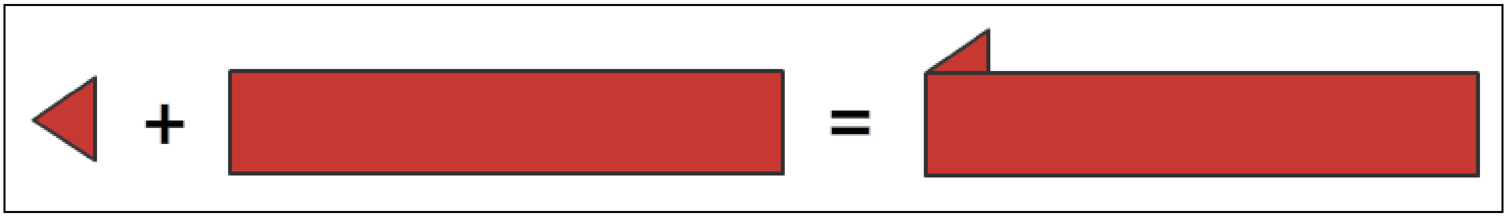
Your Score:

NEW RECORD

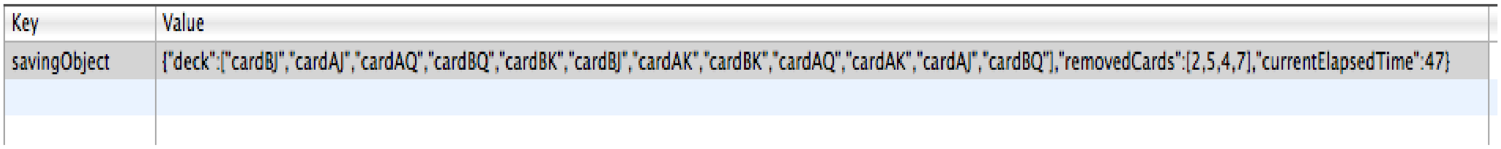
00:16

Last Score: 00:20

Saved on: 23/2/2011 20:29:32

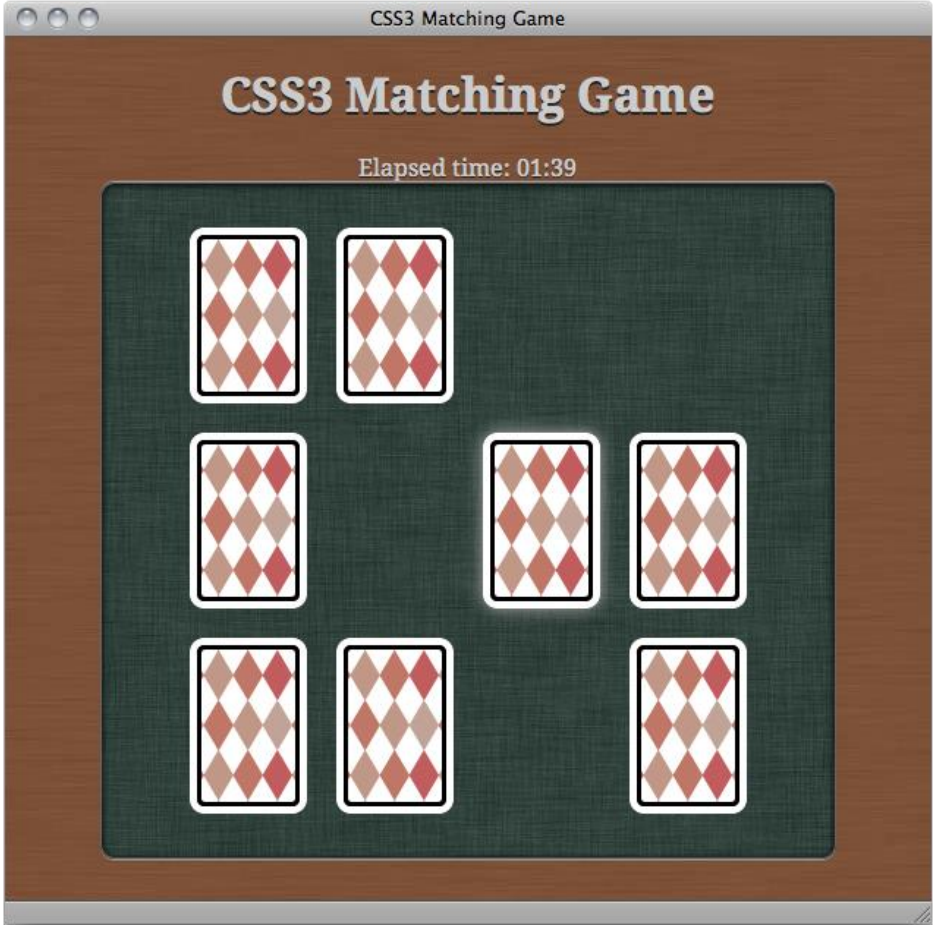


Saving the entire game progress

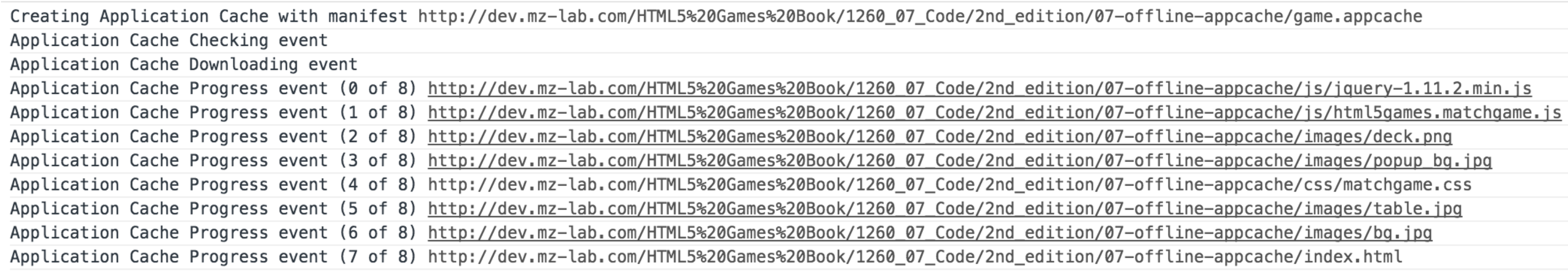


Key	Value
savingObject	{"deck":["cardBJ","cardAJ","cardAQ","cardBQ","cardBK","cardBJ","cardAK","cardBK","cardAQ","cardAK","cardAJ","cardBQ"],"removedCards":[2,5,4,7],"currentElapsedTime":47}

Resuming the game progress



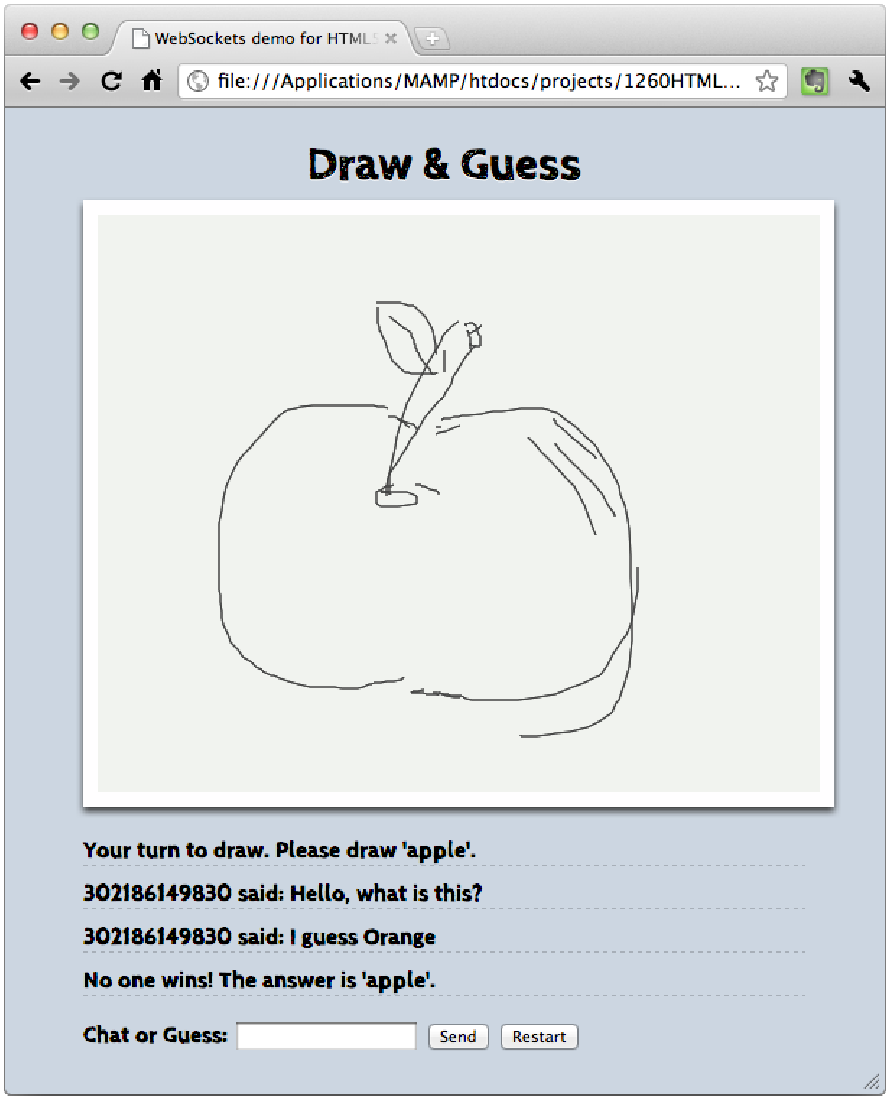
Caching the game for offline access



```
Creating Application Cache with manifest http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/game.appcache
Application Cache Checking event
Application Cache Downloading event
Application Cache Progress event (0 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/js/jquery-1.11.2.min.js
Application Cache Progress event (1 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/js/html5games.matchgame.js
Application Cache Progress event (2 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/images/deck.png
Application Cache Progress event (3 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/images/popup_bg.jpg
Application Cache Progress event (4 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/css/matchgame.css
Application Cache Progress event (5 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/images/table.jpg
Application Cache Progress event (6 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/images/bg.jpg
Application Cache Progress event (7 of 8) http://dev.mz-lab.com/HTML5%20Games%20Book/1260_07_Code/2nd_edition/07-offline-appcache/index.html
```

8

Building a Multiplayer Draw-and-Guess Game with WebSockets



WebSockets demo for HTML5
file:///Applications/MAMP/htdocs/projects/1260HTML...

Draw & Guess

Your turn to draw. Please draw 'apple'.

302186149830 said: Hello, what is this?

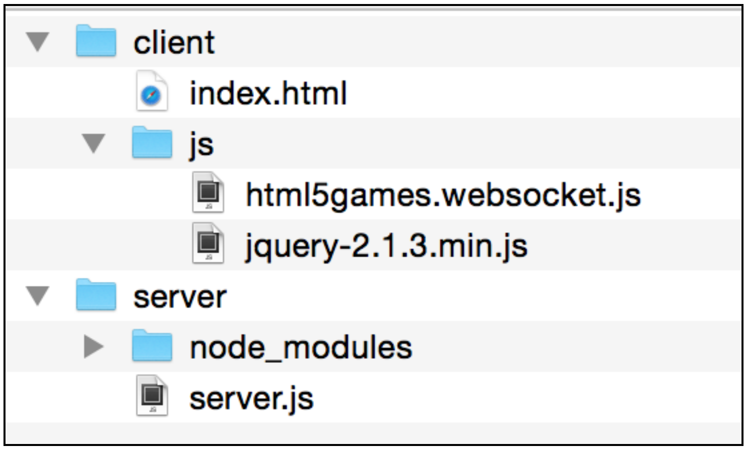
302186149830 said: I guess Orange

No one wins! The answer is 'apple'.

Chat or Guess:

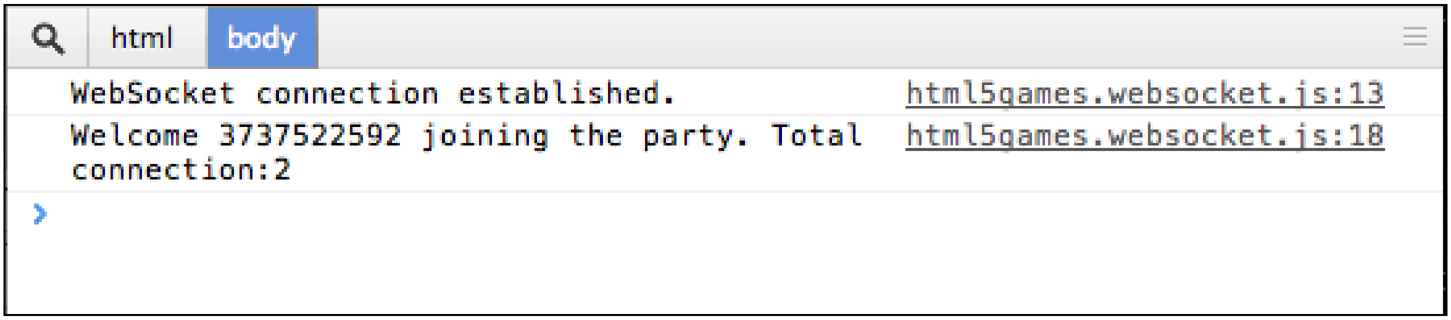
Installing a WebSocket's server

Creating a client that connects to a WebSocket server and getting the total connections count



```
client
    index.html
    js
        html5games.websocket.js
        jquery-2.1.3.min.js
server
    node_modules
    server.js
```

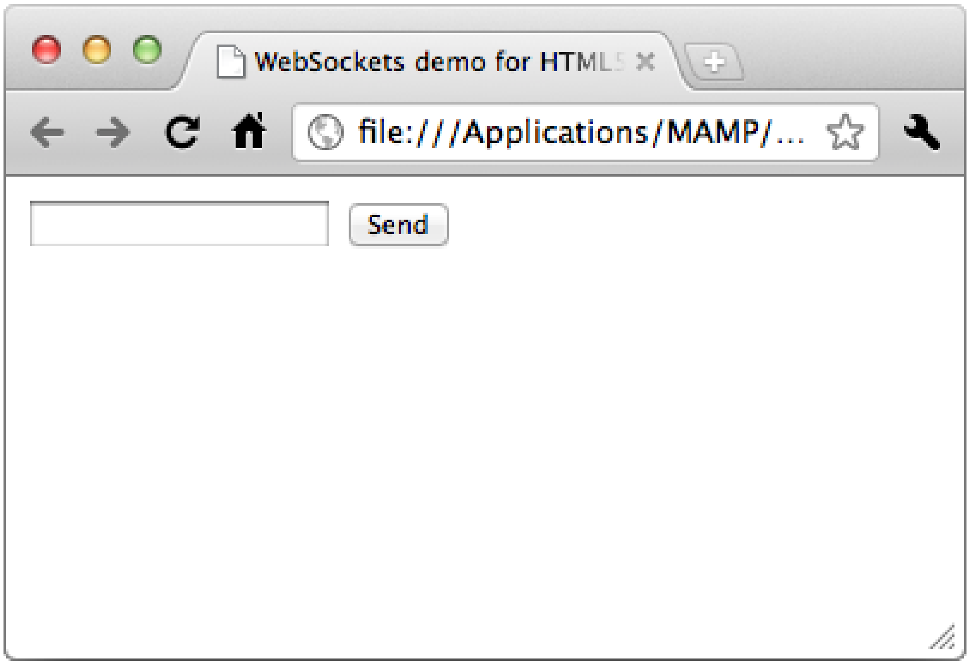
Sending a message to all connected browsers

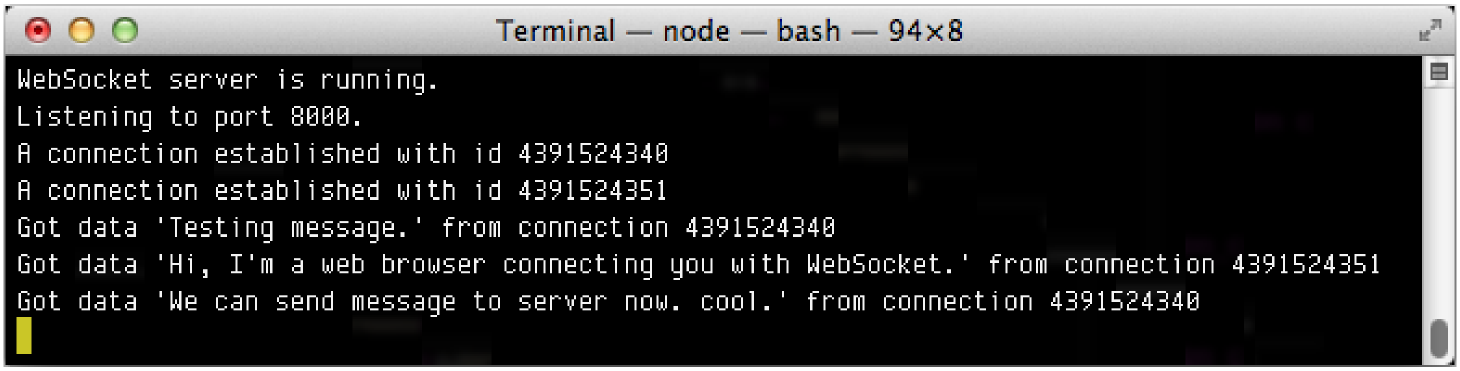


```
WebSocket connection established.            html5games.websocket.js:13
Welcome 3737522592 joining the party. Total   html5games.websocket.js:18
connection:2
>
```

Building a chatting application with WebSockets

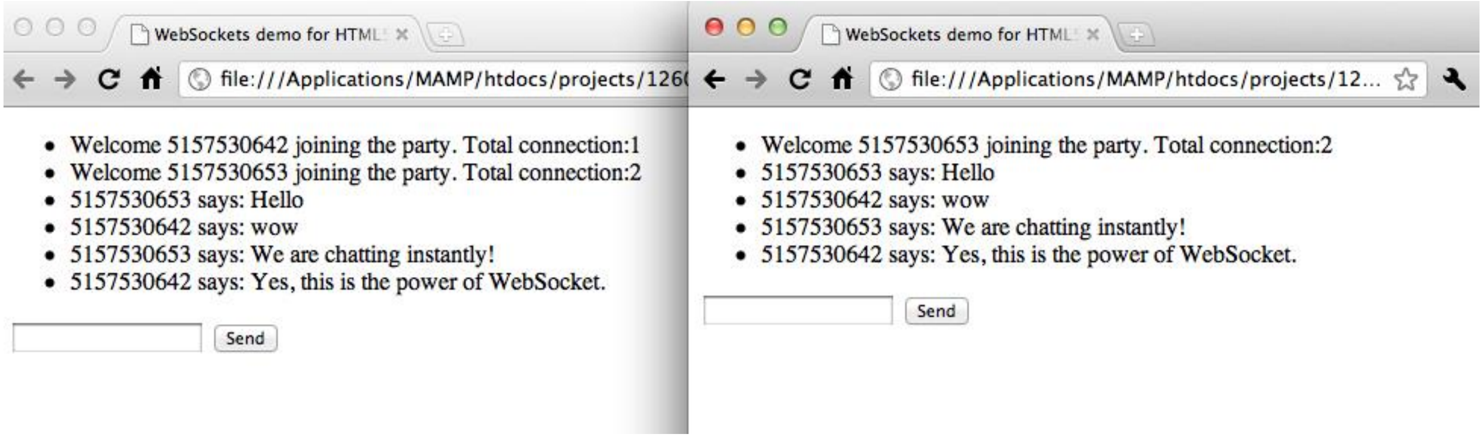
Sending a message to the server





```
WebSocket server is running.
Listening to port 8000.
A connection established with id 4391524340
A connection established with id 4391524351
Got data 'Testing message.' from connection 4391524340
Got data 'Hi, I'm a web browser connecting you with WebSocket.' from connection 4391524351
Got data 'We can send message to server now. cool.' from connection 4391524340
```

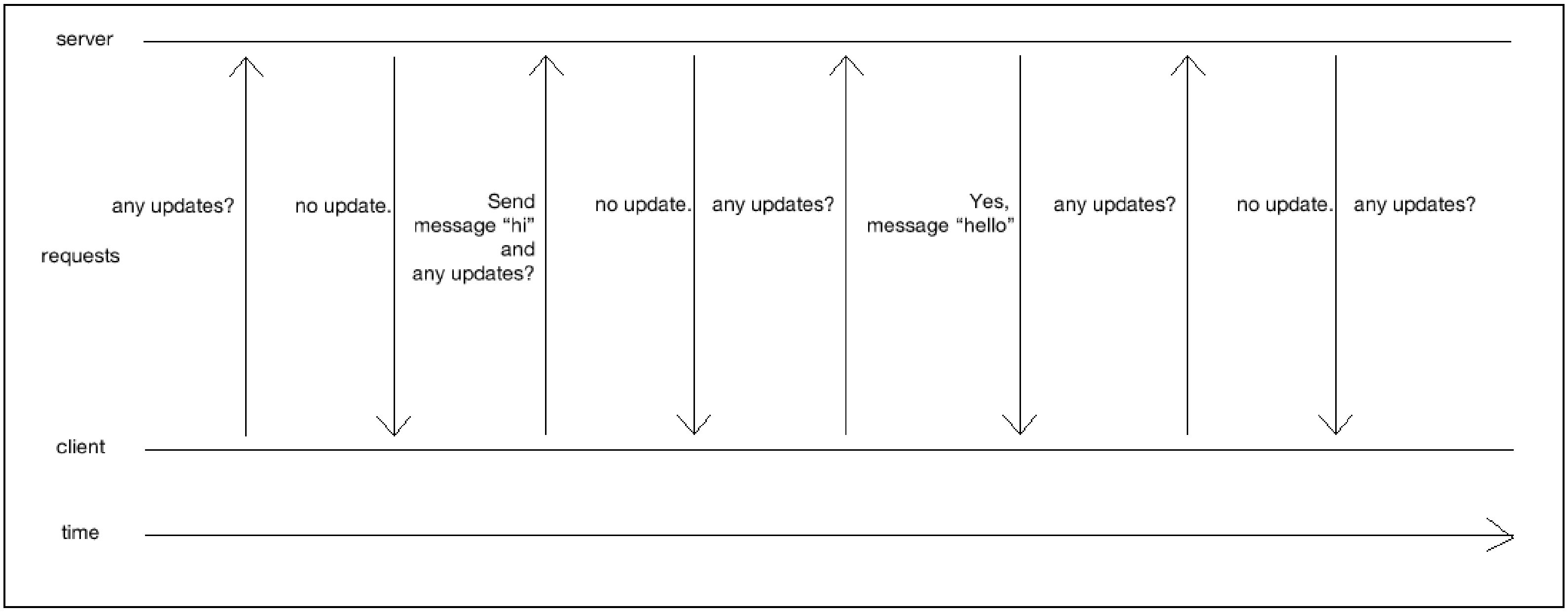
Sending every received message on the server side to create a chat room

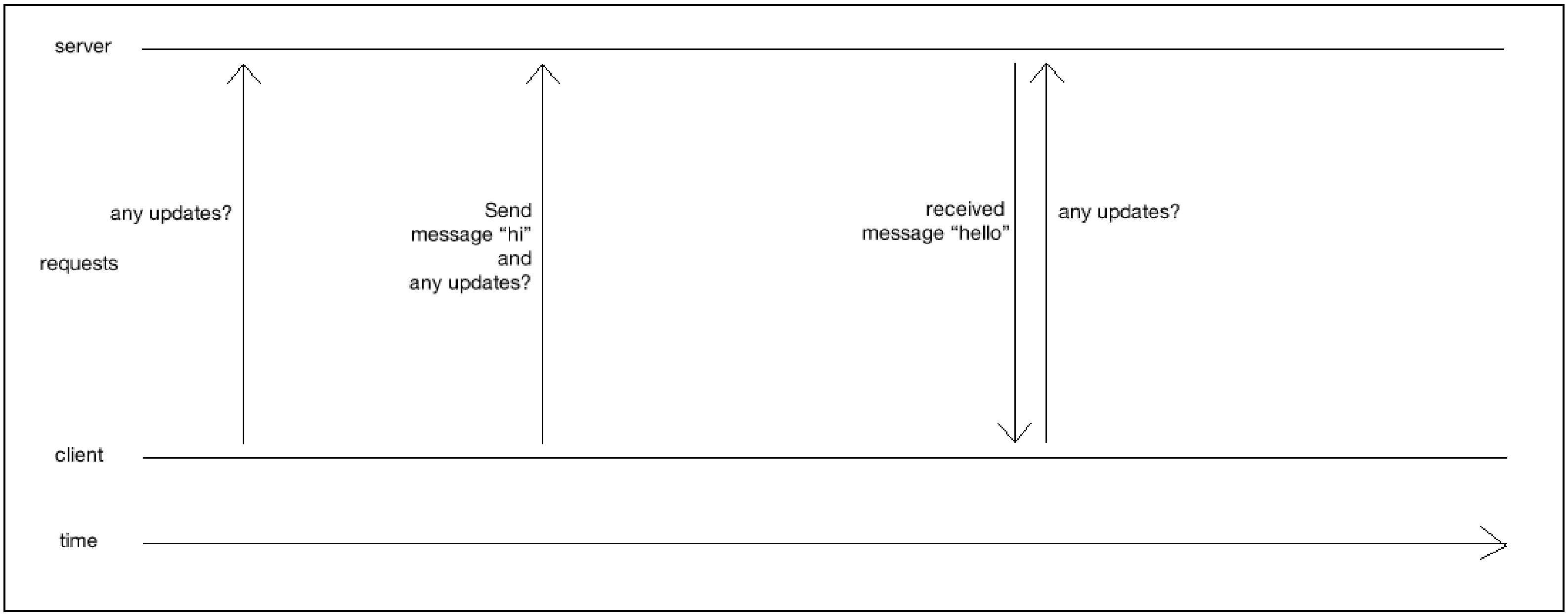

WebSockets demo for HTML
file:///Applications/MAMP/htdocs/projects/126
WebSockets demo for HTML
file:///Applications/MAMP/htdocs/projects/12...
Send
Send

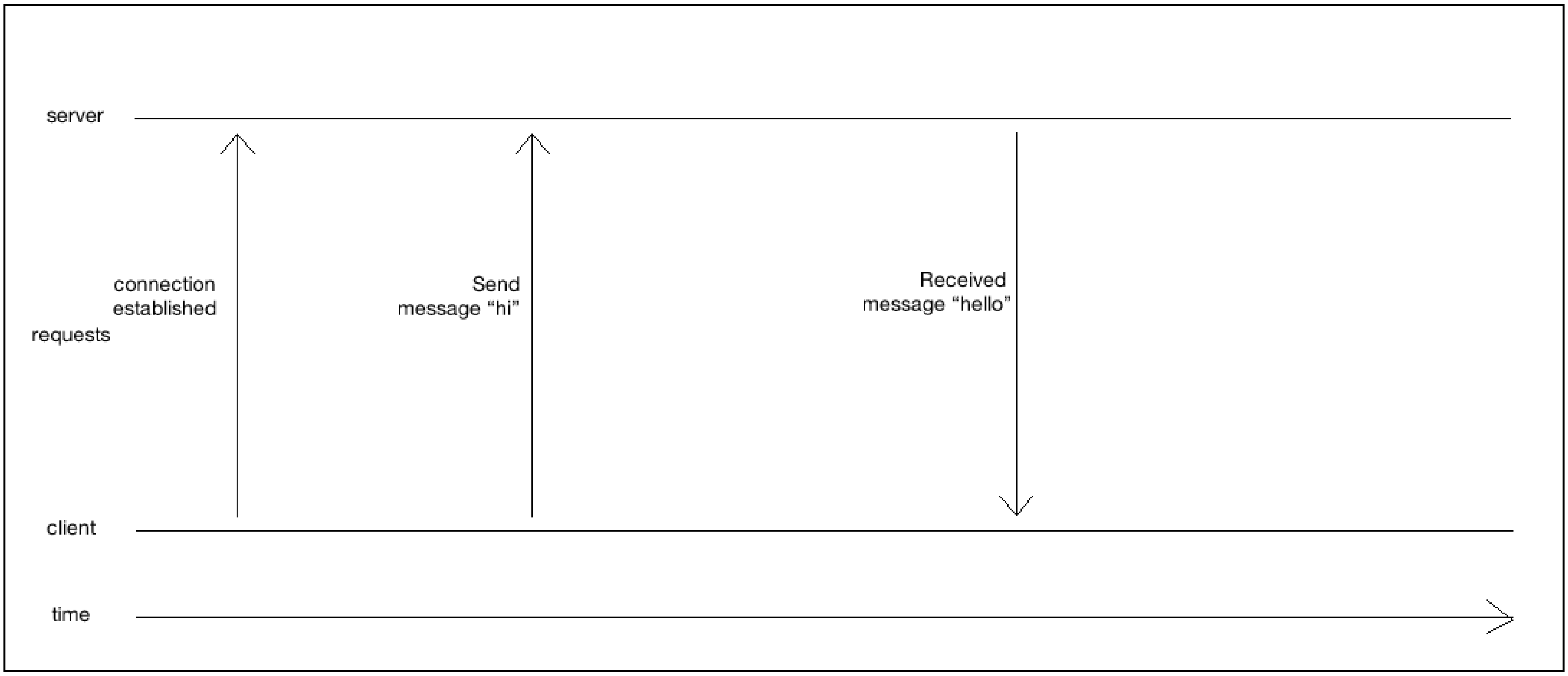
- Welcome 5157530642 joining the party. Total connection:1
- Welcome 5157530653 joining the party. Total connection:2
- 5157530653 says: Hello
- 5157530642 says: wow
- 5157530653 says: We are chatting instantly!
- 5157530642 says: Yes, this is the power of WebSocket.

- Welcome 5157530653 joining the party. Total connection:2
- 5157530653 says: Hello
- 5157530642 says: wow
- 5157530653 says: We are chatting instantly!
- 5157530642 says: Yes, this is the power of WebSocket.

Comparing WebSockets with polling approaches

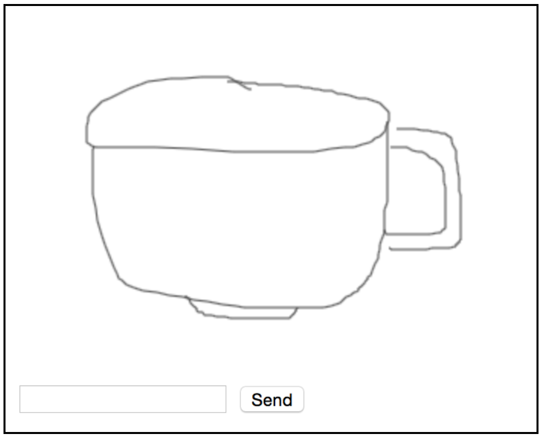



server
any updates?
requests
Send
message “hi”
and
any updates?
received
message “hello”
any updates?
client
time

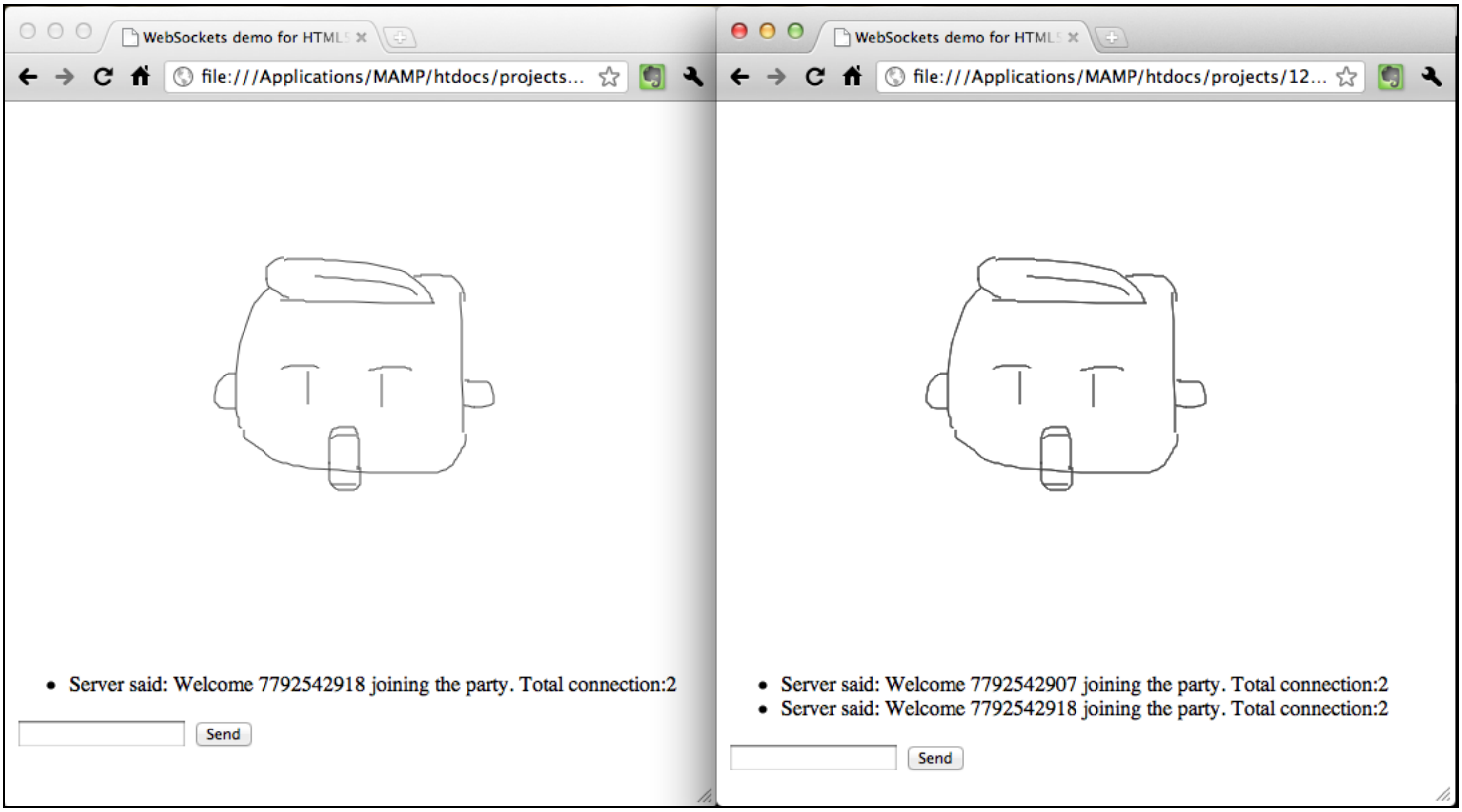

server
connection
established
requests
Send
message “hi”
Received
message “hello”
client
time

Making a shared drawing whiteboard with Canvas and WebSockets

Building a local drawing sketchpad



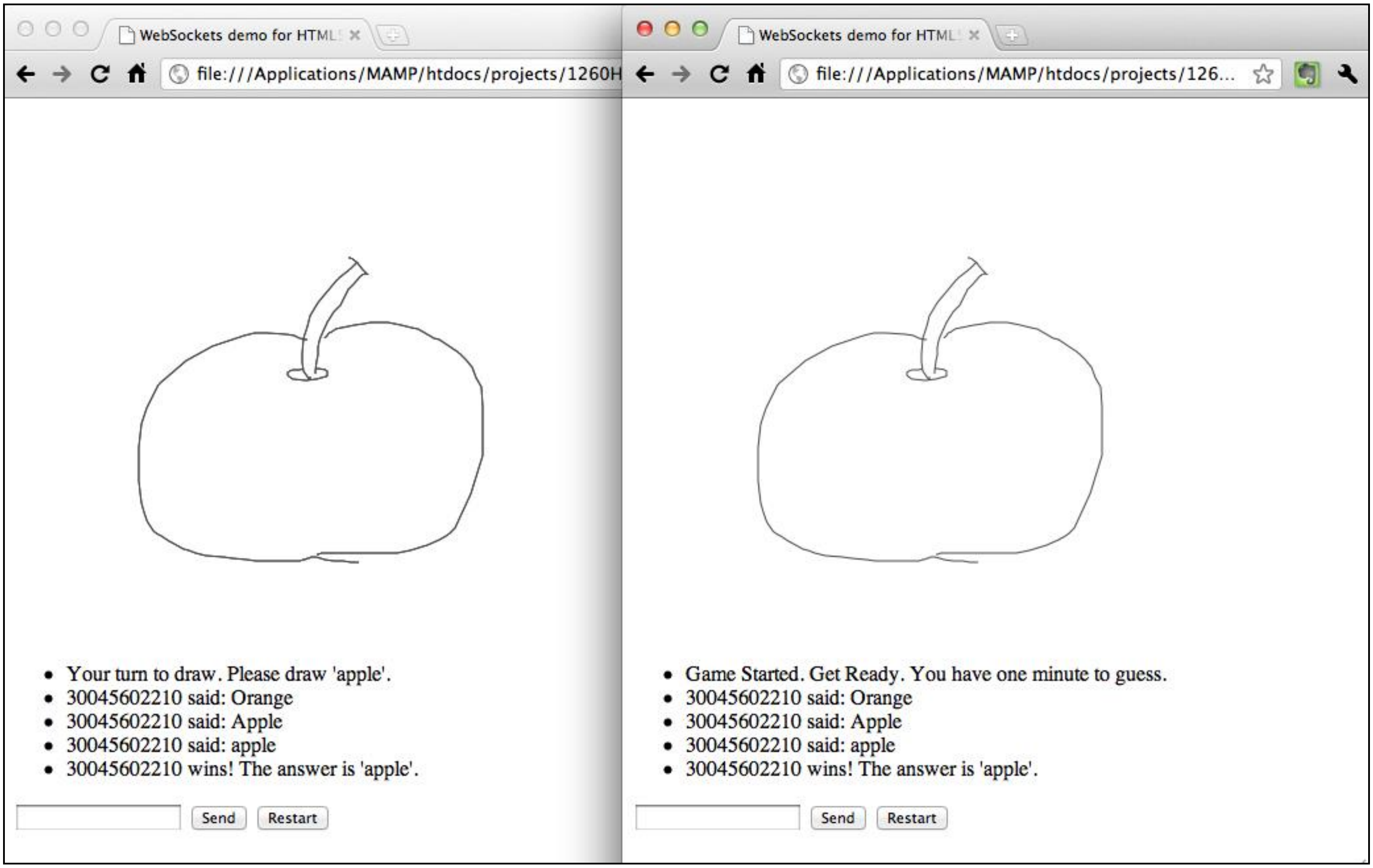
Sending the drawing to all the connected browsers


WebSockets demo for HTML
file:///Applications/MAMP/htdocs/projects...
Send
WebSockets demo for HTML
file:///Applications/MAMP/htdocs/projects/12...
Send

- Server said: Welcome 7792542918 joining the party. Total connection:2

- Server said: Welcome 7792542907 joining the party. Total connection:2
- Server said: Welcome 7792542918 joining the party. Total connection:2

Building a multiplayer draw-and-guess game


WebSockets demo for HTML5
file:///Applications/MAMP/htdocs/projects/1260H
WebSockets demo for HTML5
file:///Applications/MAMP/htdocs/projects/126...
Send
Restart
Send
Restart

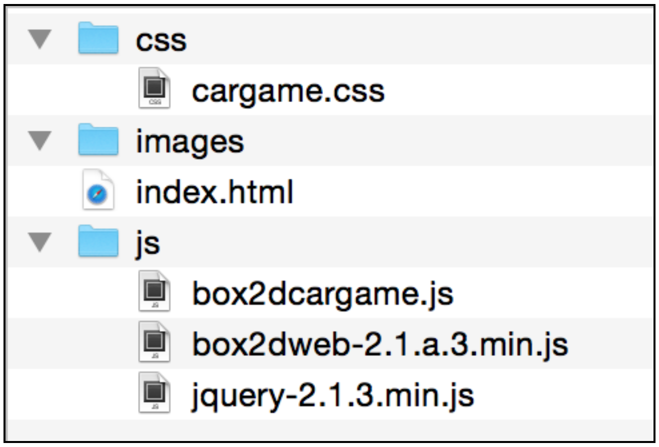
- Your turn to draw. Please draw 'apple'.
- 30045602210 said: Orange
- 30045602210 said: Apple
- 30045602210 said: apple
- 30045602210 wins! The answer is 'apple'.

- Game Started. Get Ready. You have one minute to guess.
- 30045602210 said: Orange
- 30045602210 said: Apple
- 30045602210 said: apple
- 30045602210 wins! The answer is 'apple'.

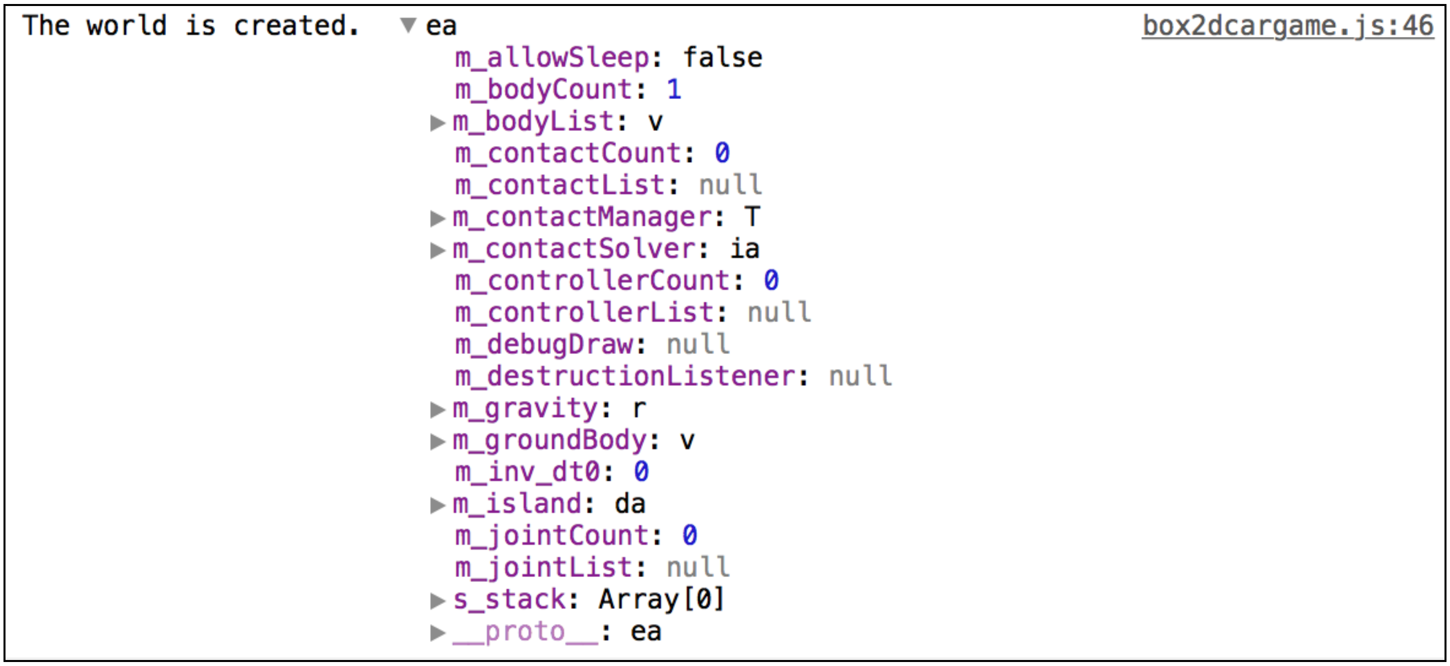
9

Building a Physics Car Game with Box2D and Canvas

Installing the Box2D JavaScript library

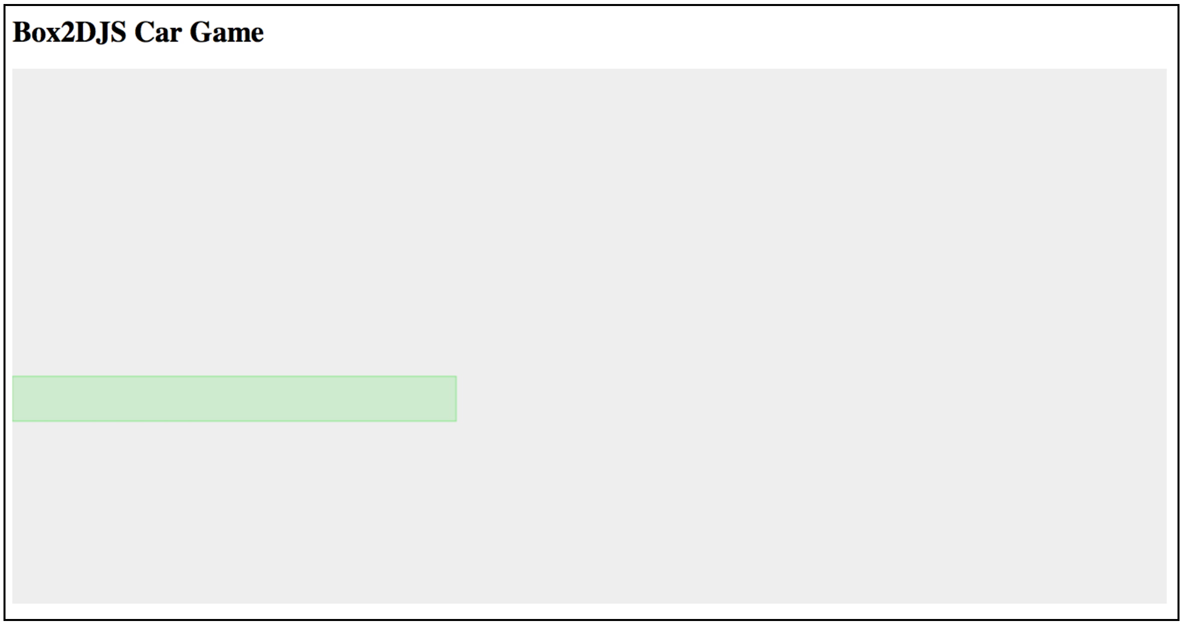


```
▼ css
      cargame.css
▼ images
  index.html
▼ js
      box2dcargame.js
      box2dweb-2.1.a.3.min.js
      jquery-2.1.3.min.js
```



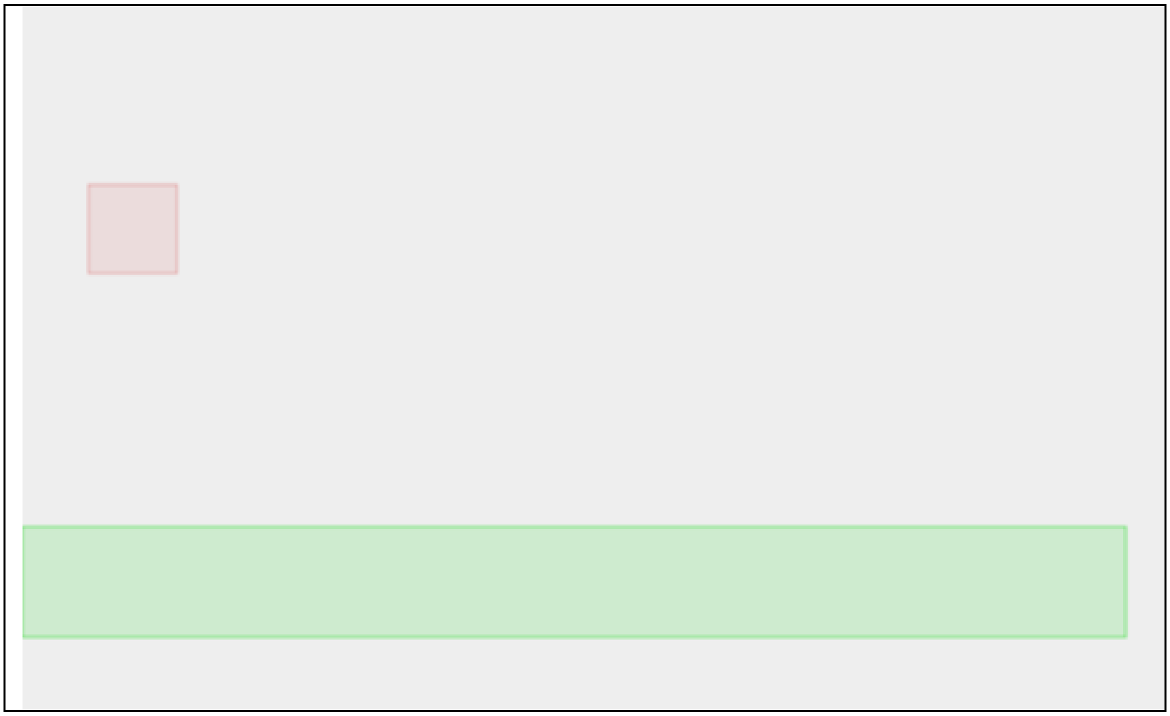
```
The world is created.  ▼ea                                             box2dcargame.js:46
                          m_allowSleep: false
                          m_bodyCount: 1
                         ▶m_bodyList: v
                          m_contactCount: 0
                          m_contactList: null
                         ▶m_contactManager: T
                         ▶m_contactSolver: ia
                          m_controllerCount: 0
                          m_controllerList: null
                          m_debugDraw: null
                          m_destructionListener: null
                         ▶m_gravity: r
                         ▶m_groundBody: v
                          m_inv_dt0: 0
                         ▶m_island: da
                          m_jointCount: 0
                          m_jointList: null
                         ▶s_stack: Array[0]
                         ▶__proto__: ea
```

Drawing the physics world in the canvas

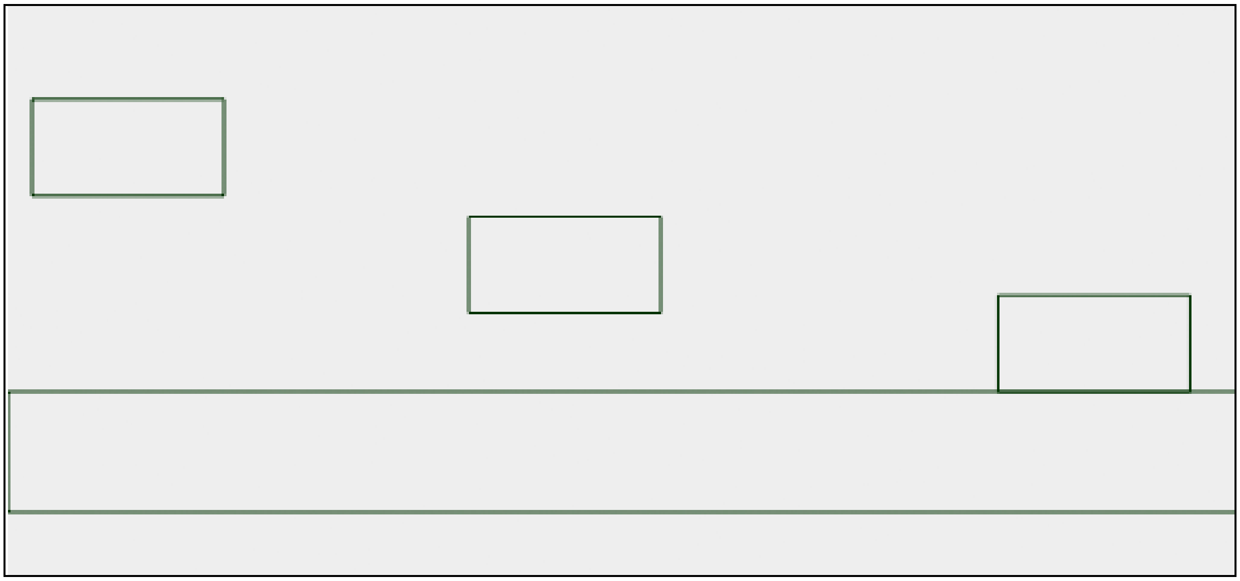


Box2DJS Car Game

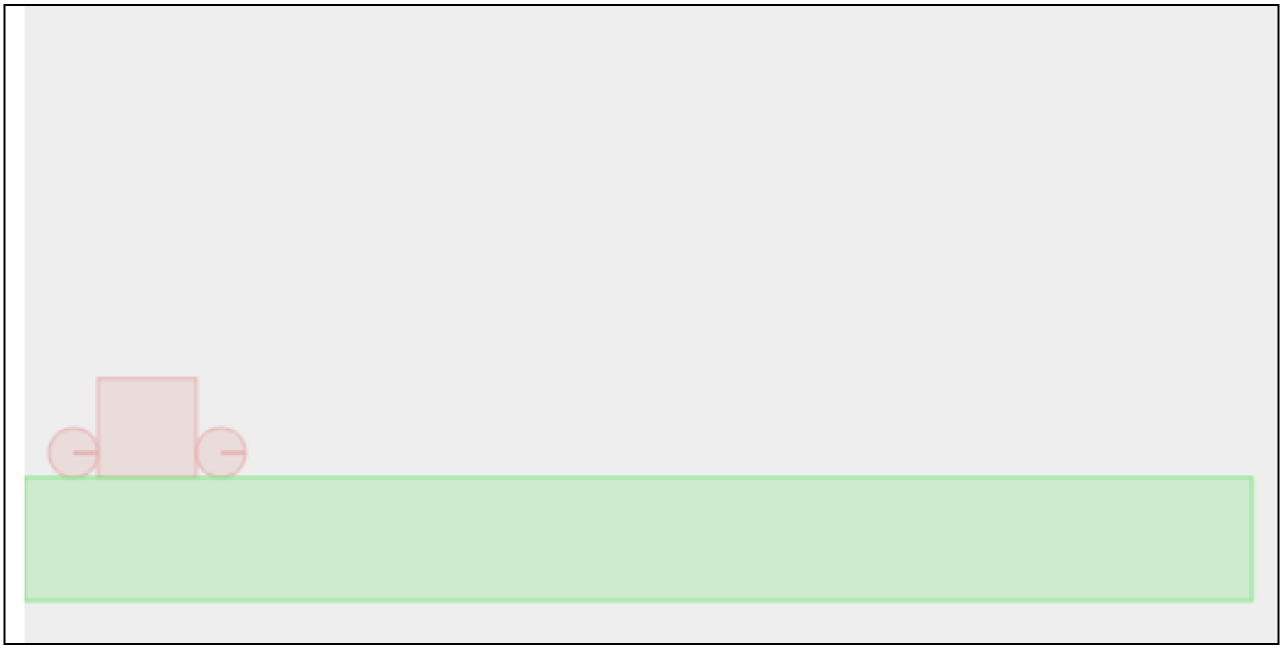
Creating a dynamic box in the physics world



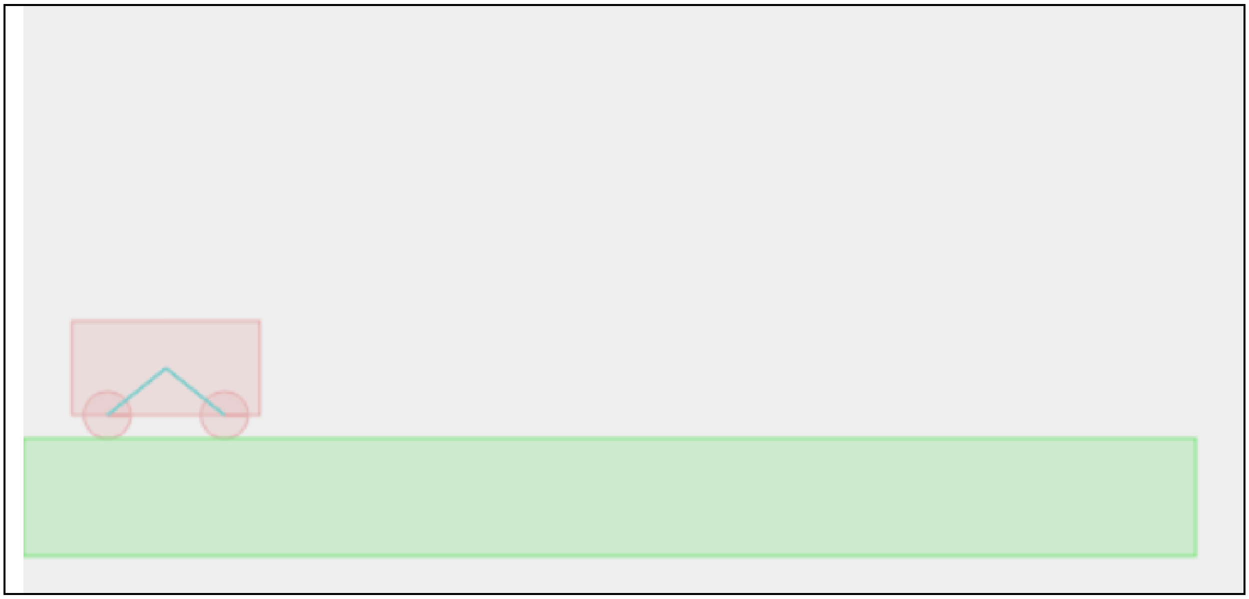
Advancing the world time



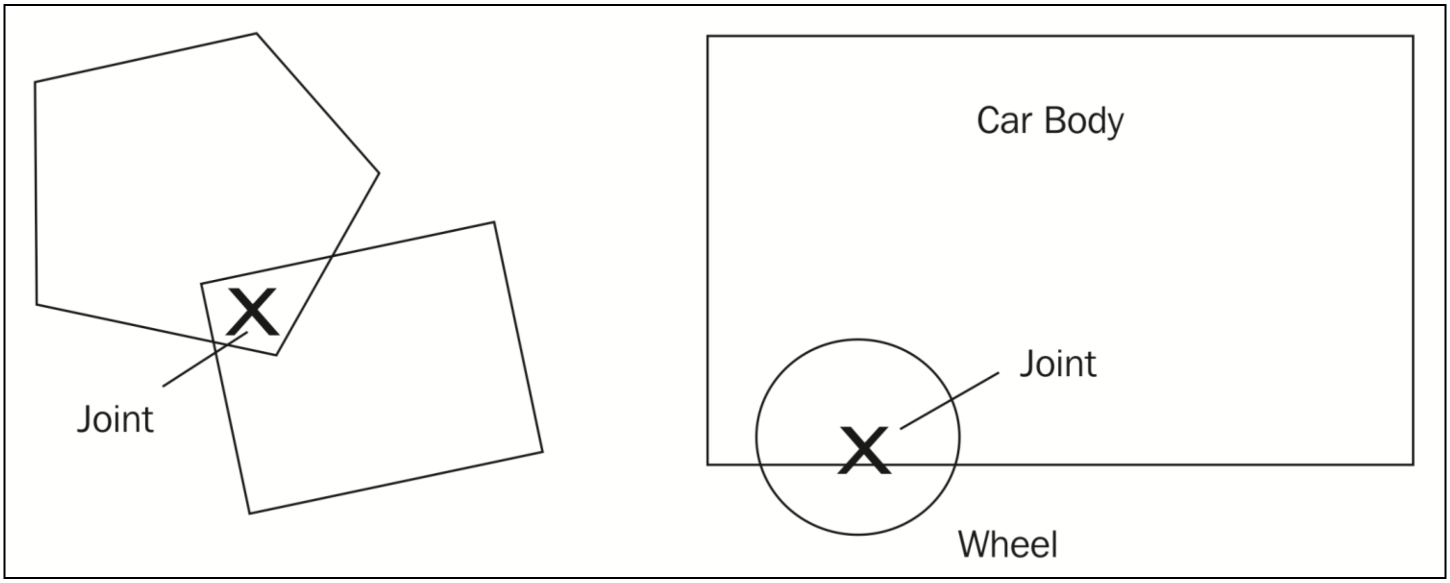
Adding wheels to the game



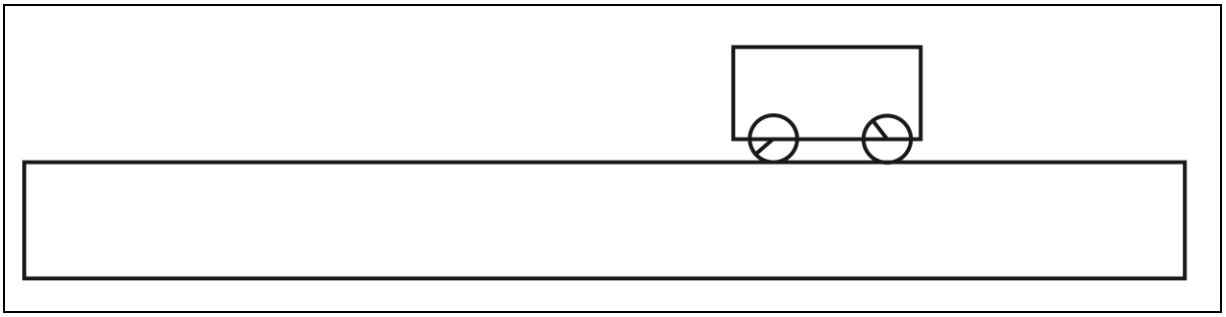
Creating a physical car



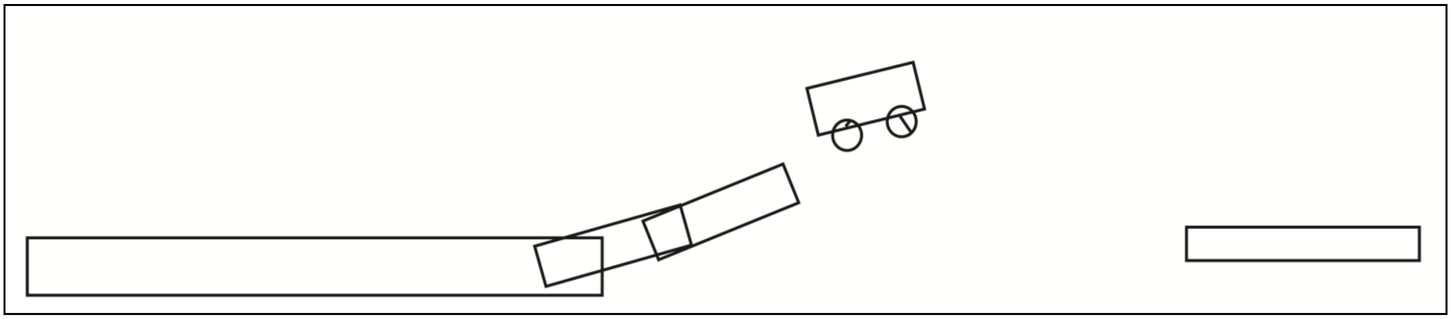
Using a revolute joint to create an anchor point between two bodies



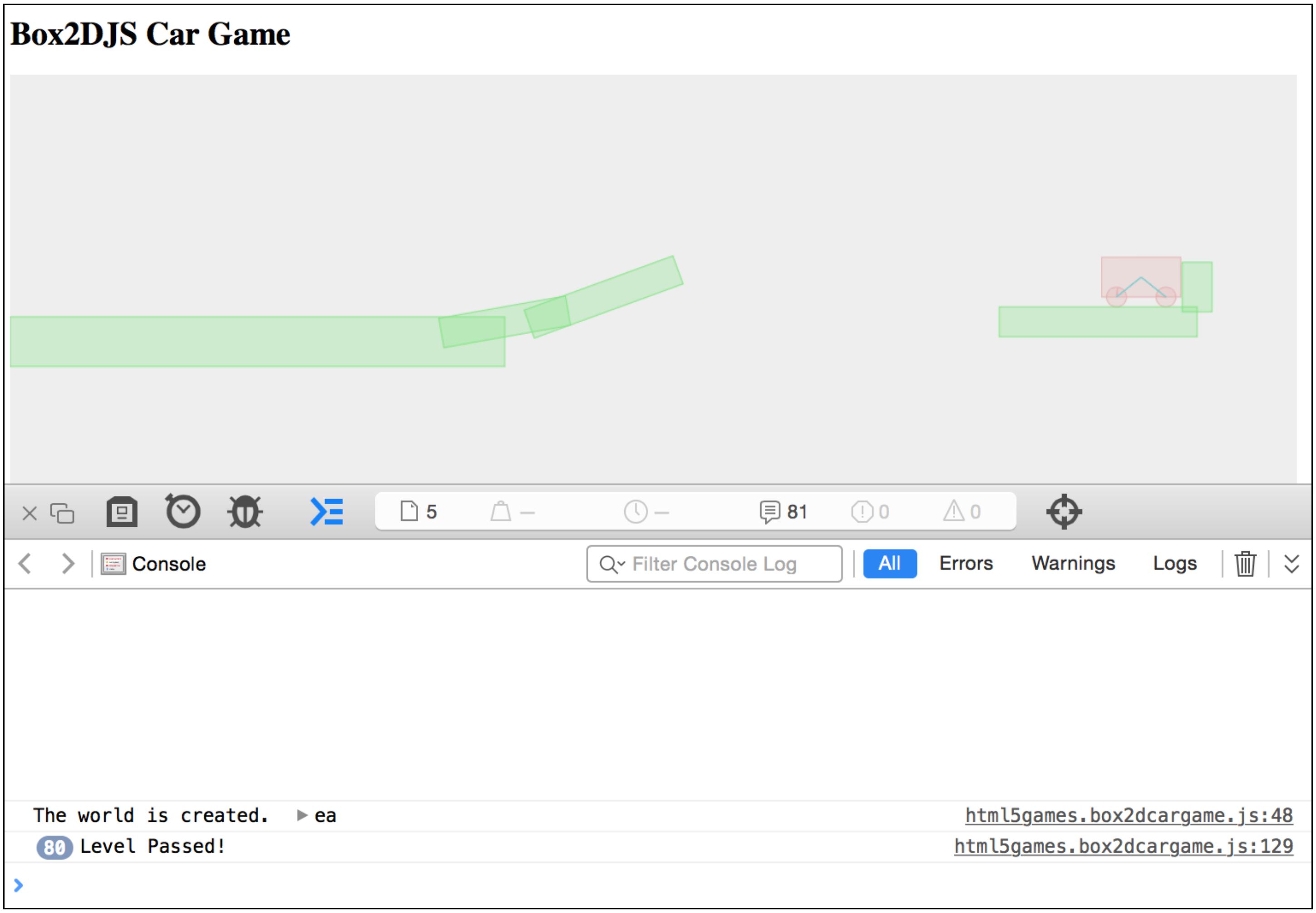
Adding force to the car with a keyboard input



Adding ramps to our game environment



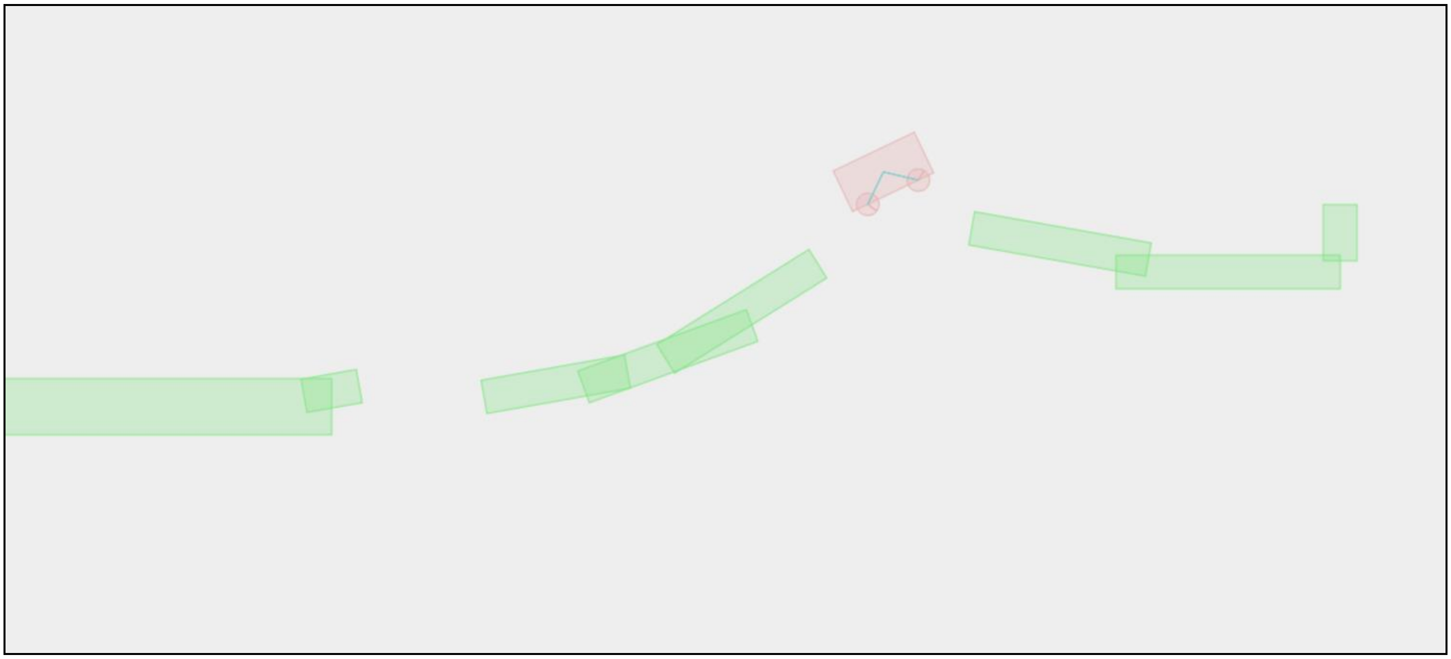
Checking collisions in the Box2D world



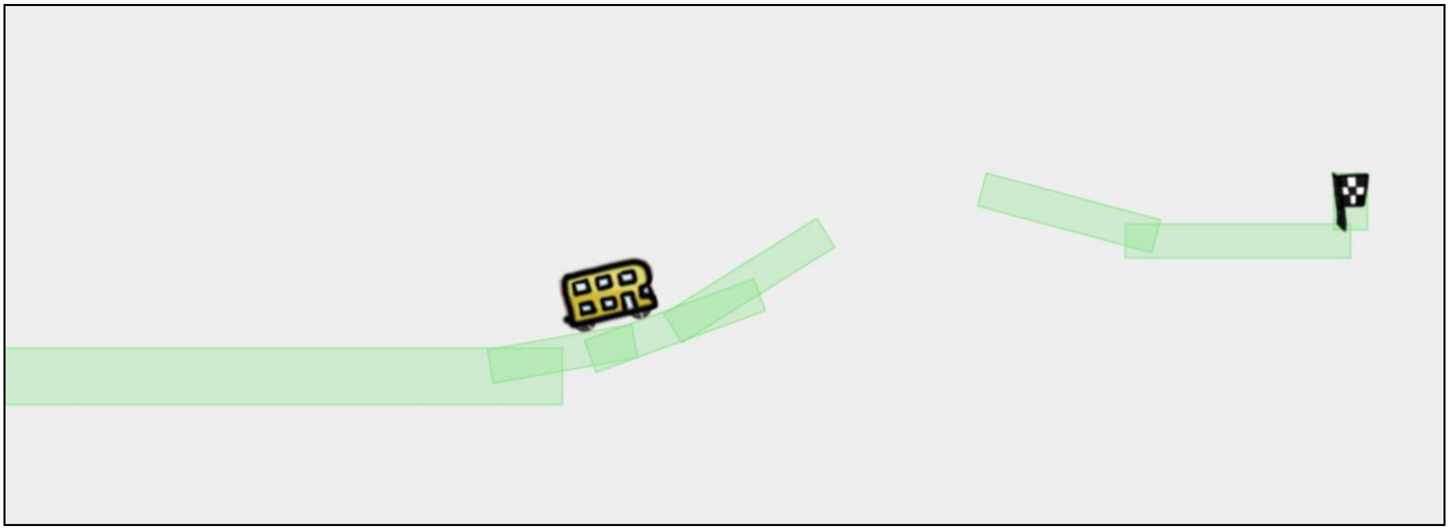
Box2DJS Car Game

```
The world is created.  ▶ ea                                   html5games.box2dcargame.js:48
80 Level Passed!                                              html5games.box2dcargame.js:129
```

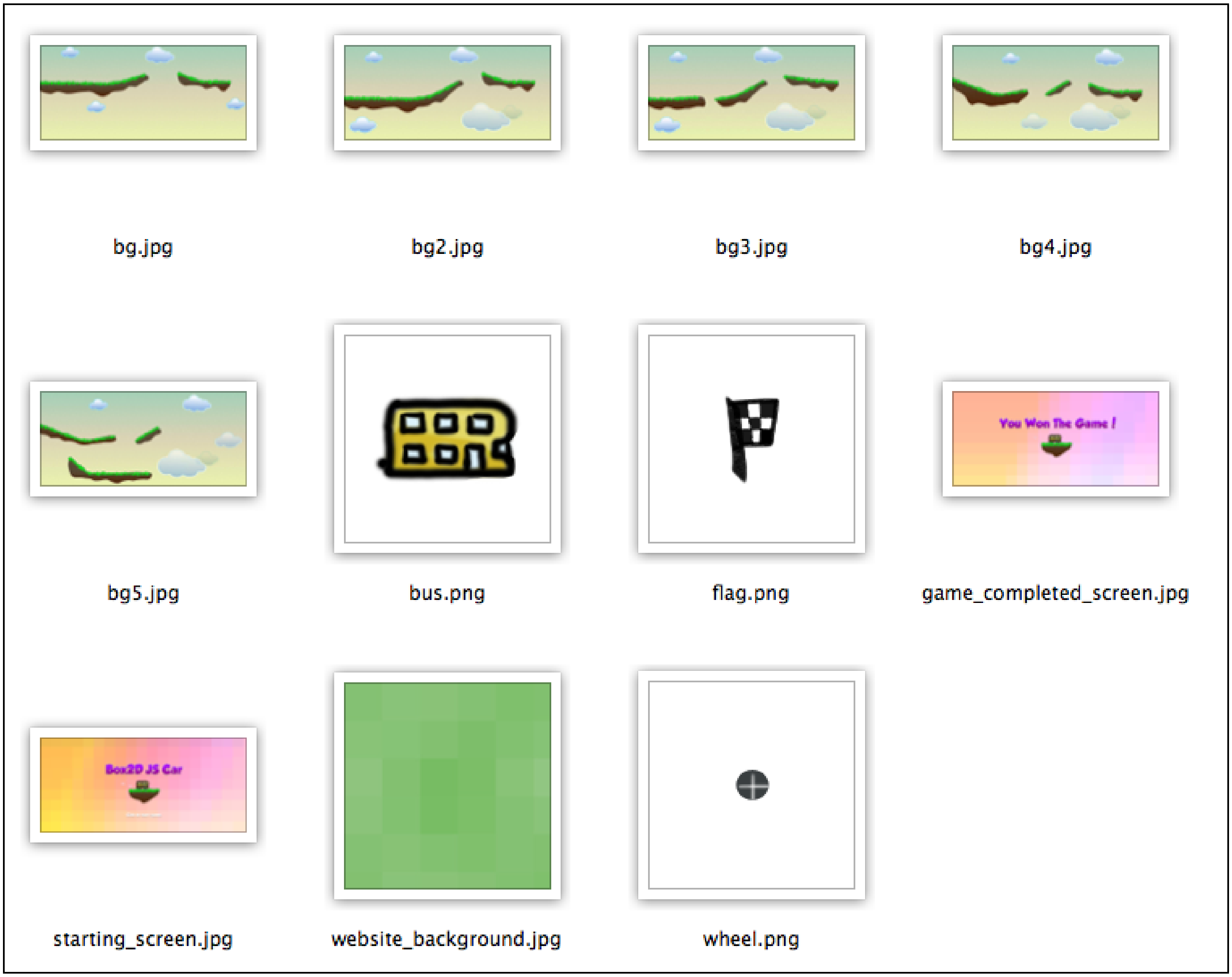
Adding a level support to our car game

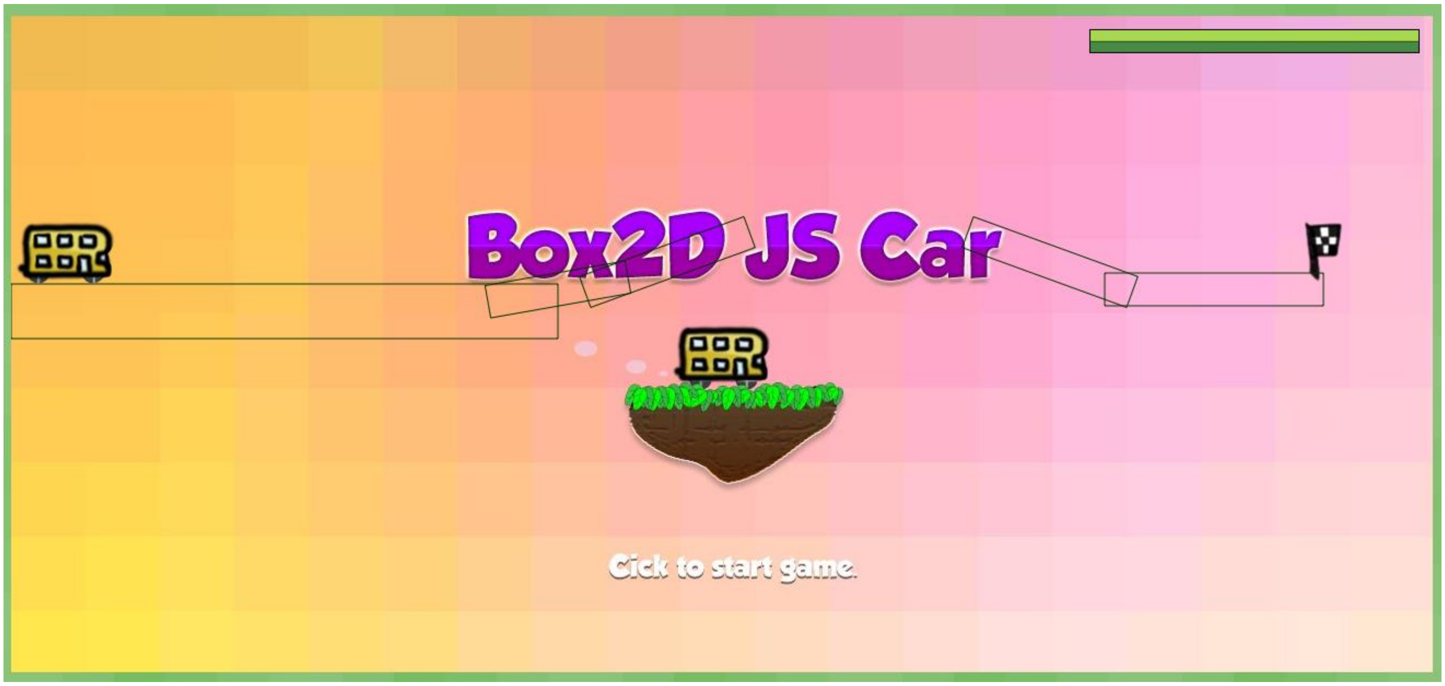


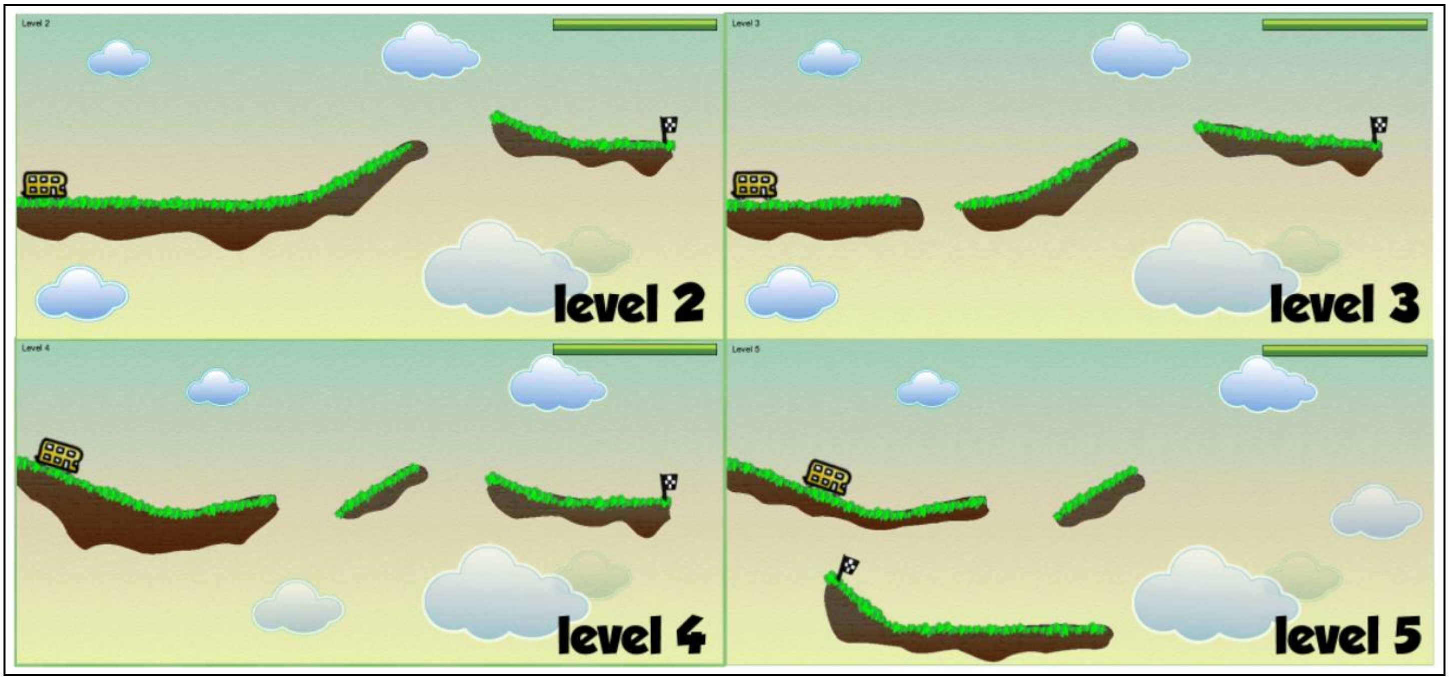
Replacing the Box2D outline drawing with graphics

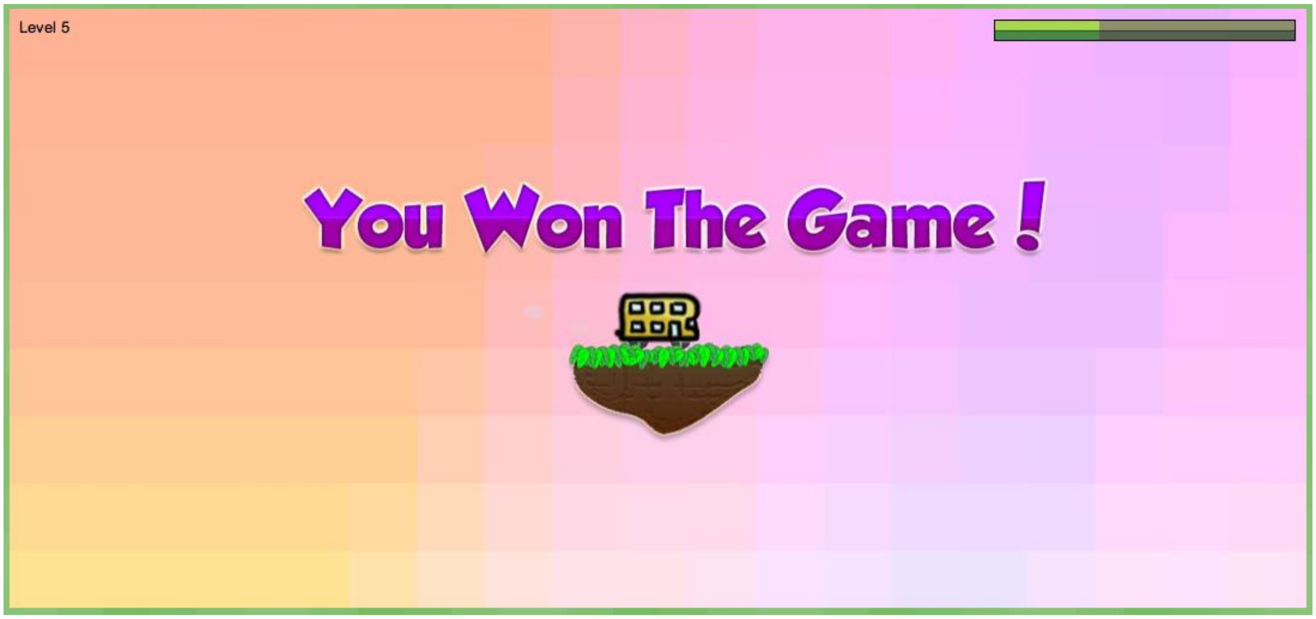


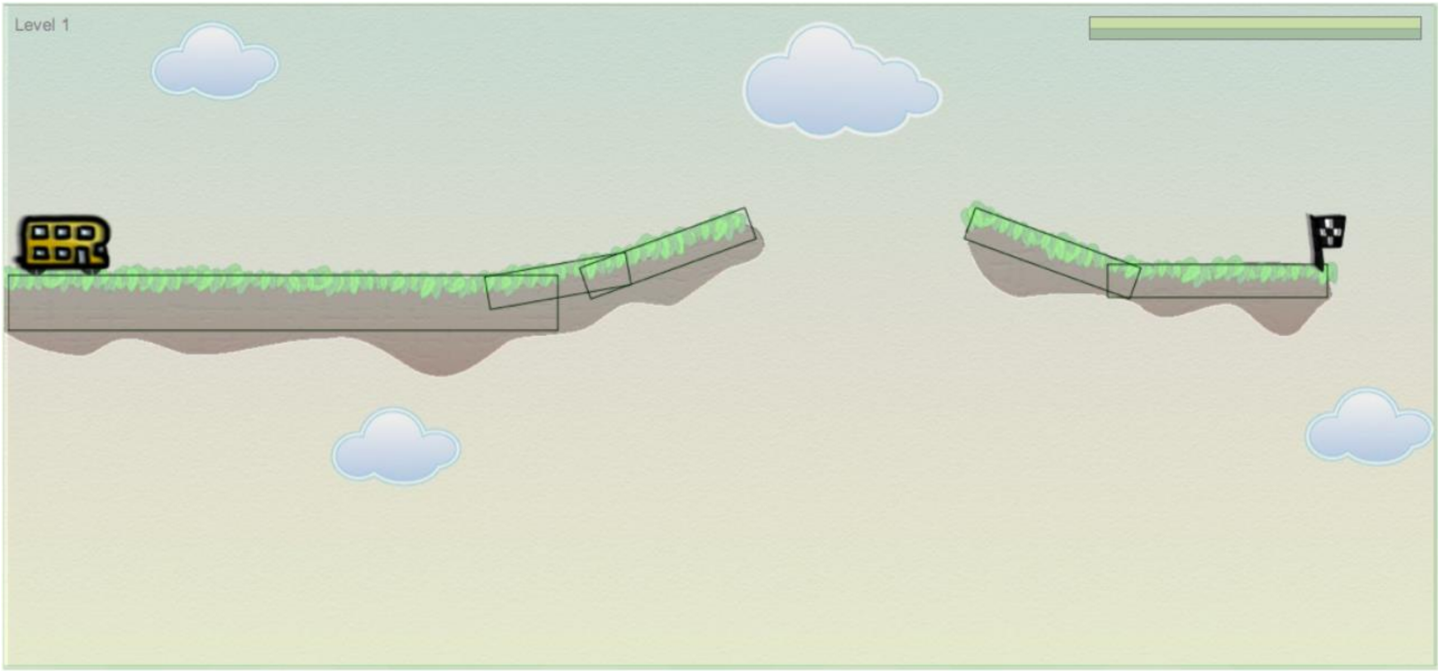
Adding a final touch to make the game fun to play



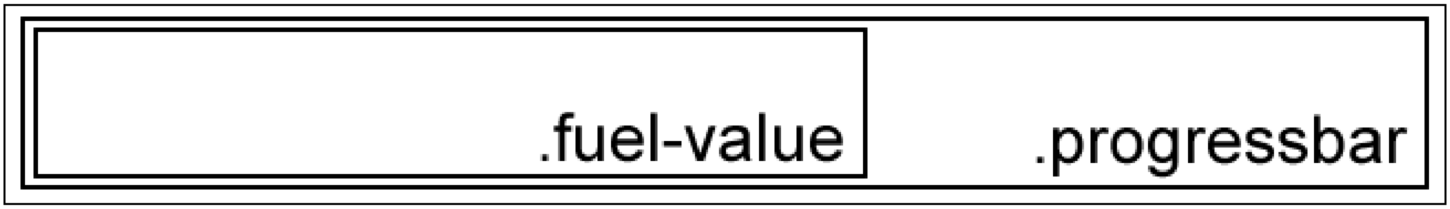

Box2D JS Car
Cick to start game.


Level 2
level 2
Level 3
level 3
Level 4
level 4
Level 5
level 5

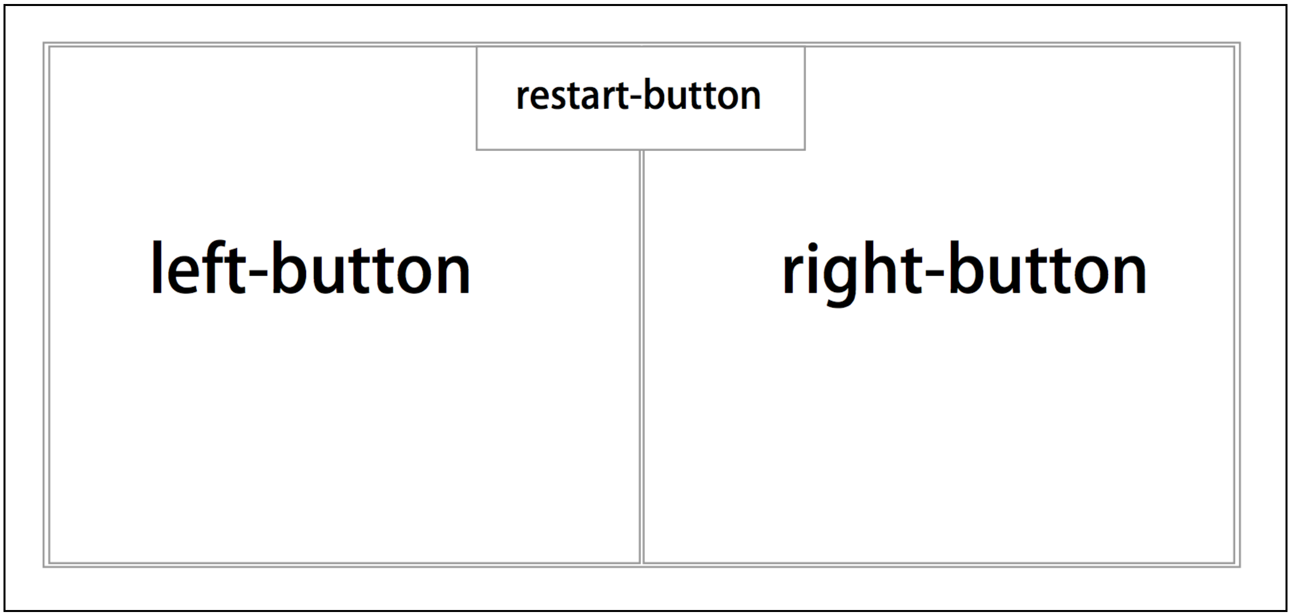




Presenting the remaining fuel in a CSS3 progress bar



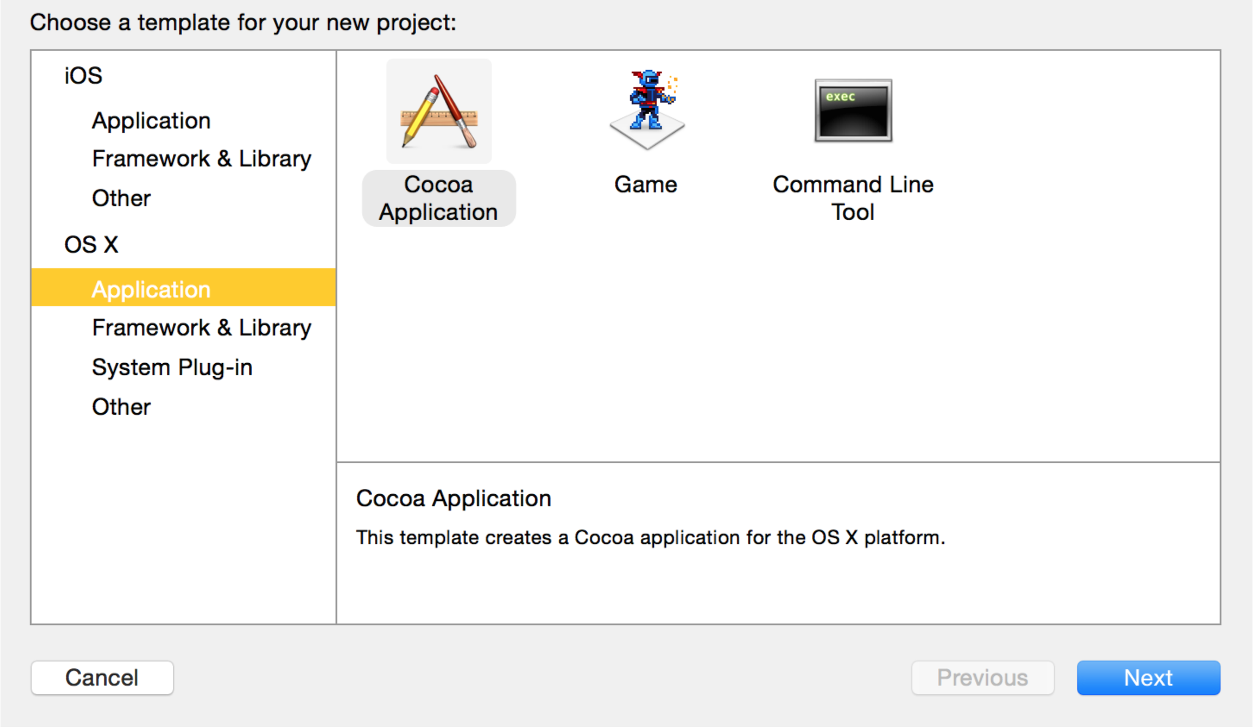
Adding touch support for tablets



10

Deploying HTML5 Games

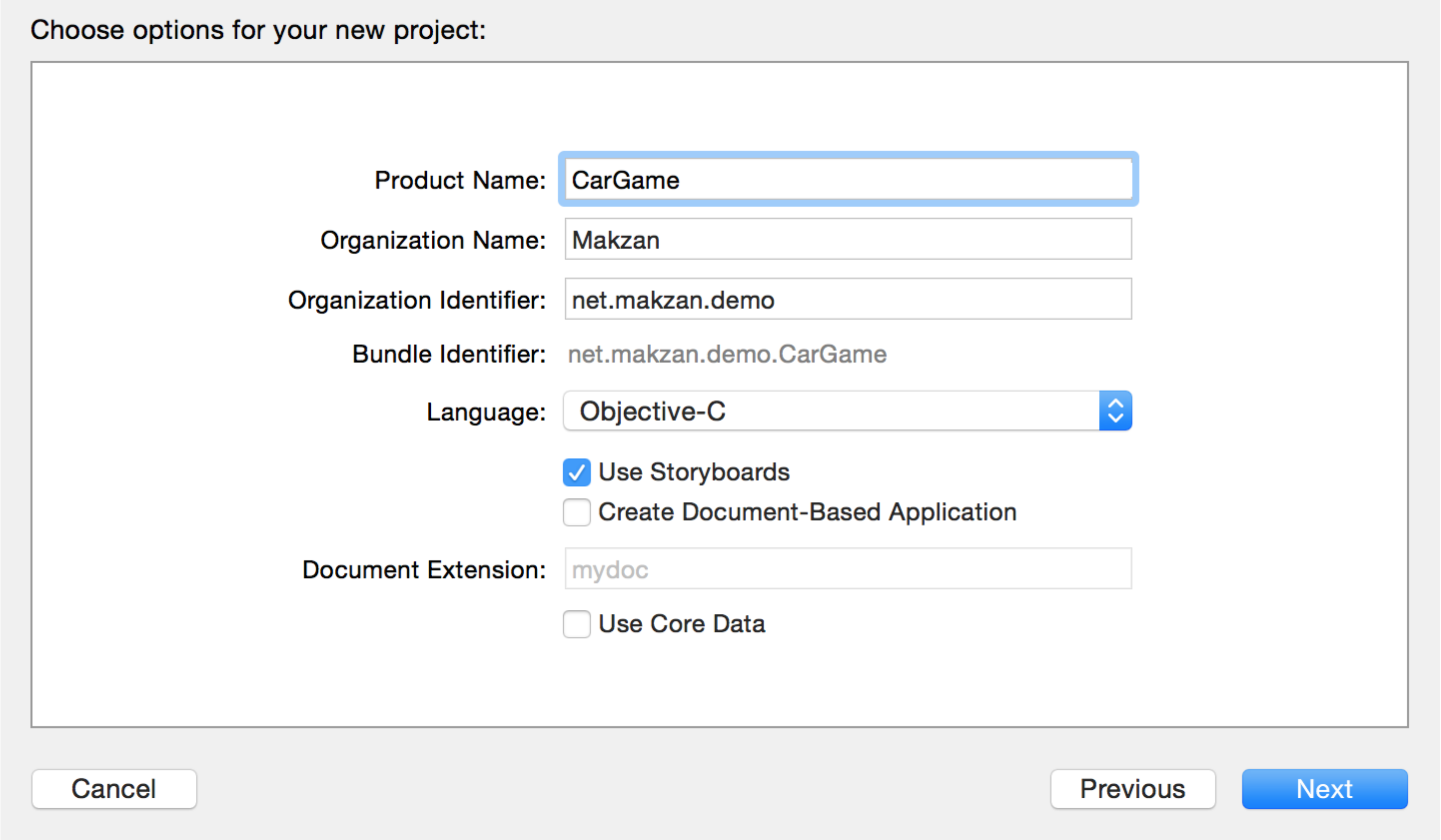
Building an HTML5 game into a Mac OS X app



Choose a template for your new project:

Cocoa Application

This template creates a Cocoa application for the OS X platform.



Choose options for your new project:

Product Name: CarGame

Organization Name: Makzan

Organization Identifier: net.makzan.demo

Bundle Identifier: net.makzan.demo.CarGame

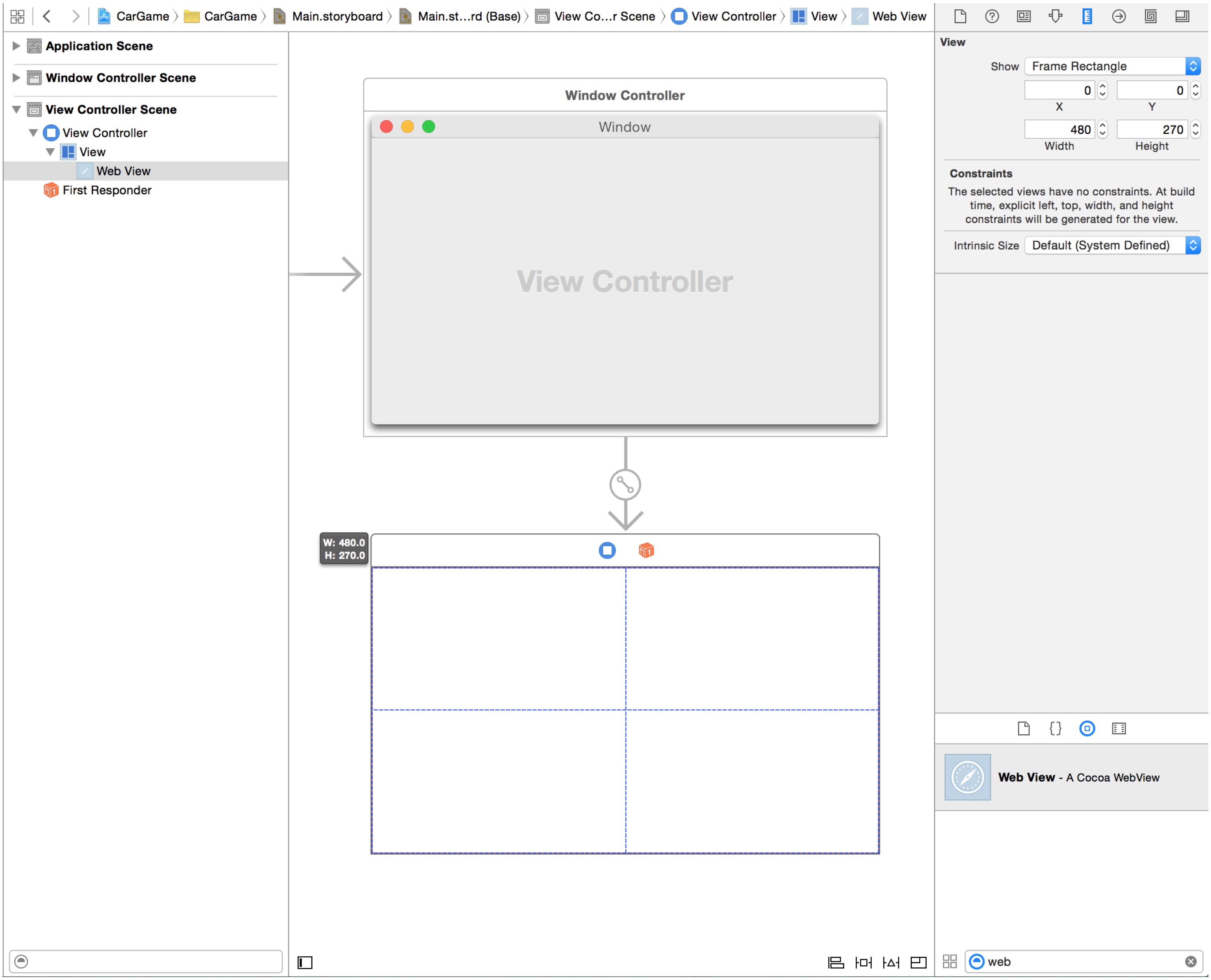
Language: Objective-C

☑ Use Storyboards

□ Create Document-Based Application

Document Extension: mydoc

□ Use Core Data



View

Show: Frame Rectangle

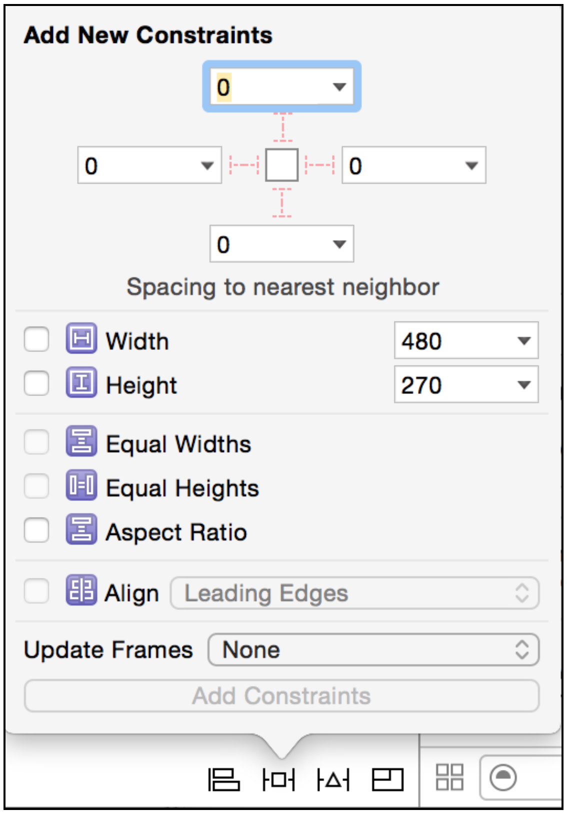
X: 0 Y: 0

Width: 480 Height: 270

Constraints

The selected views have no constraints. At build time, explicit left, top, width, and height constraints will be generated for the view.

Intrinsic Size: Default (System Defined)



Add New Constraints

0

0 0

0

Spacing to nearest neighbor

□ Width 480

□ Height 270

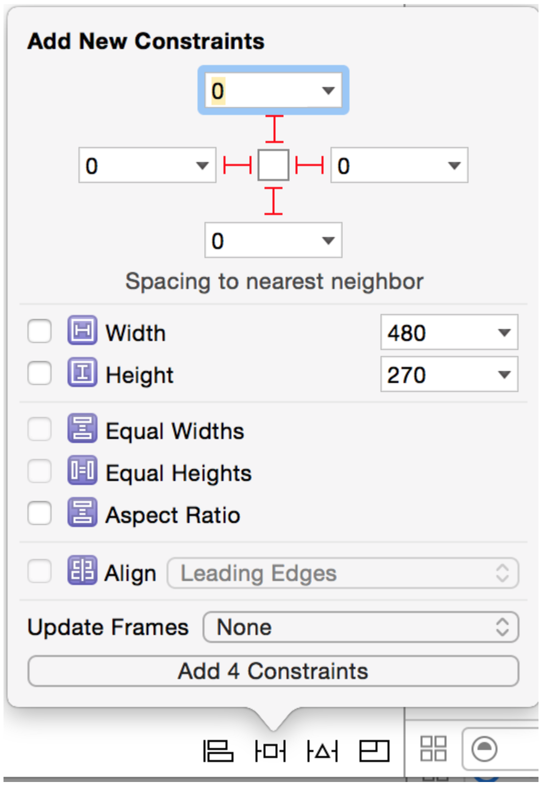
□ Equal Widths

□ Equal Heights

□ Aspect Ratio

□ Align Leading Edges

Update Frames None



Add New Constraints

0

0 0

0

Spacing to nearest neighbor

□ Width 480

□ Height 270

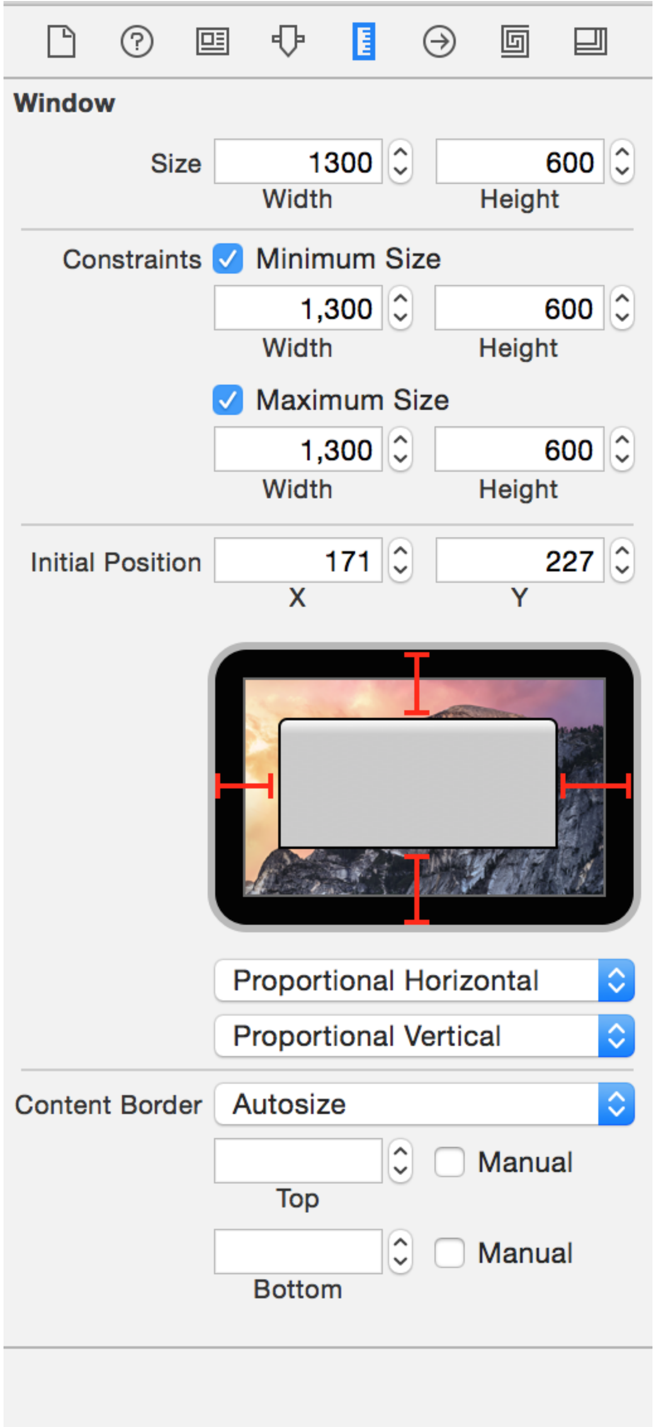
□ Equal Widths

□ Equal Heights

□ Aspect Ratio

□ Align Leading Edges

Update Frames None



Window

Size: 1300 Width, 600 Height

Constraints: ☑ Minimum Size: 1,300 Width, 600 Height

☑ Maximum Size: 1,300 Width, 600 Height

Initial Position: 171 X, 227 Y

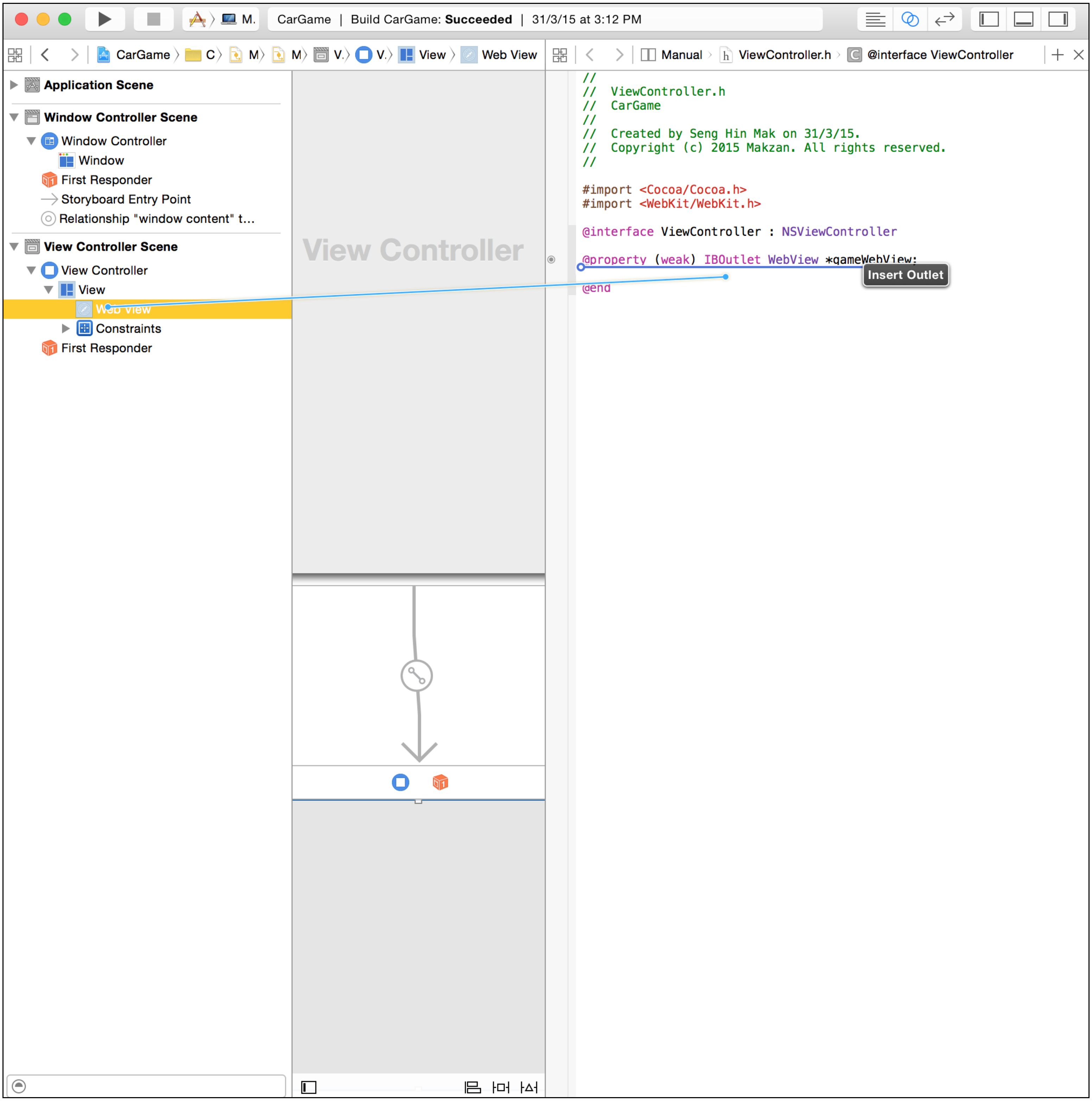
Proportional Horizontal

Proportional Vertical

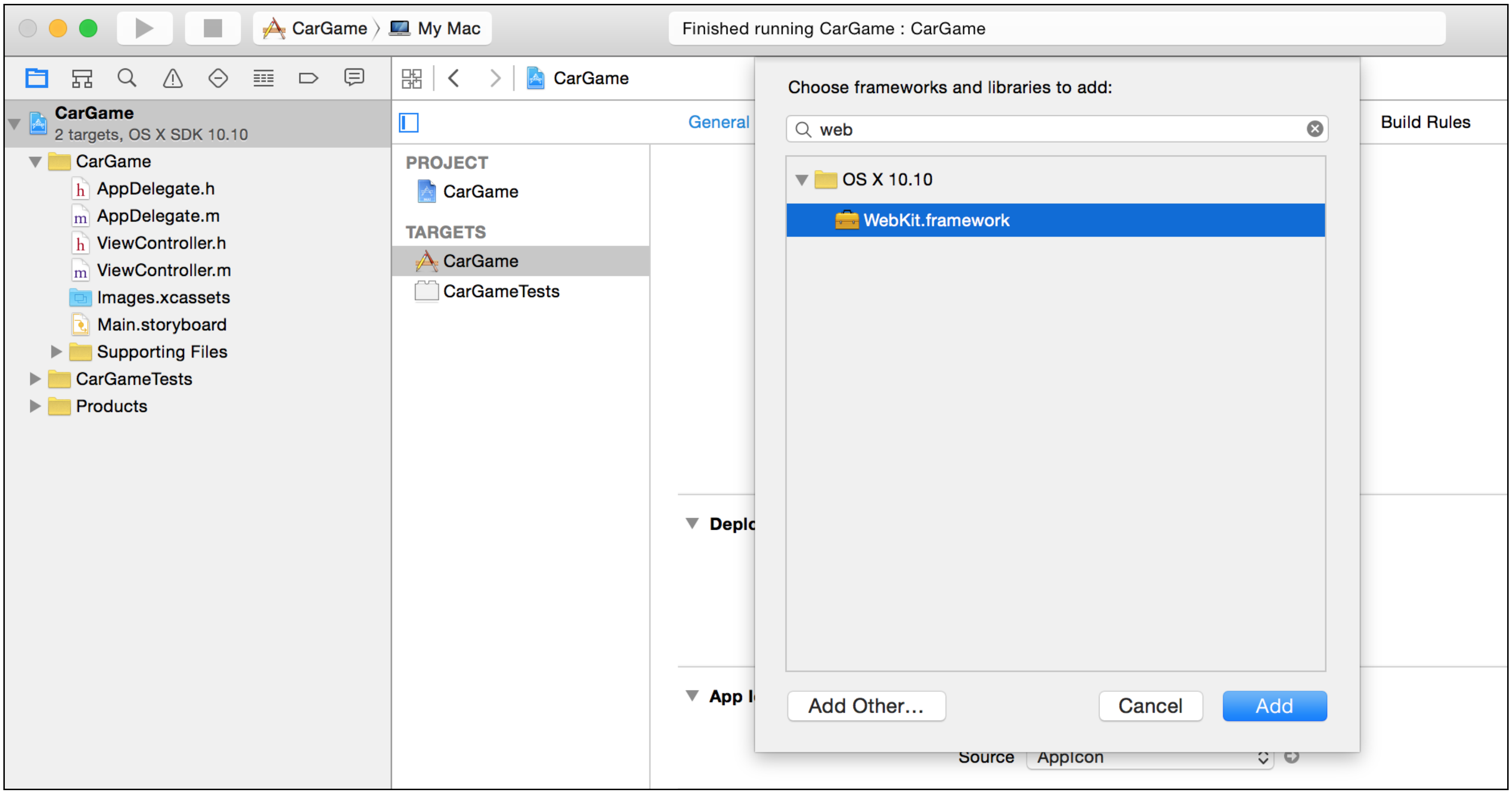
Content Border: Autosize

Top ☐ Manual

Bottom ☐ Manual



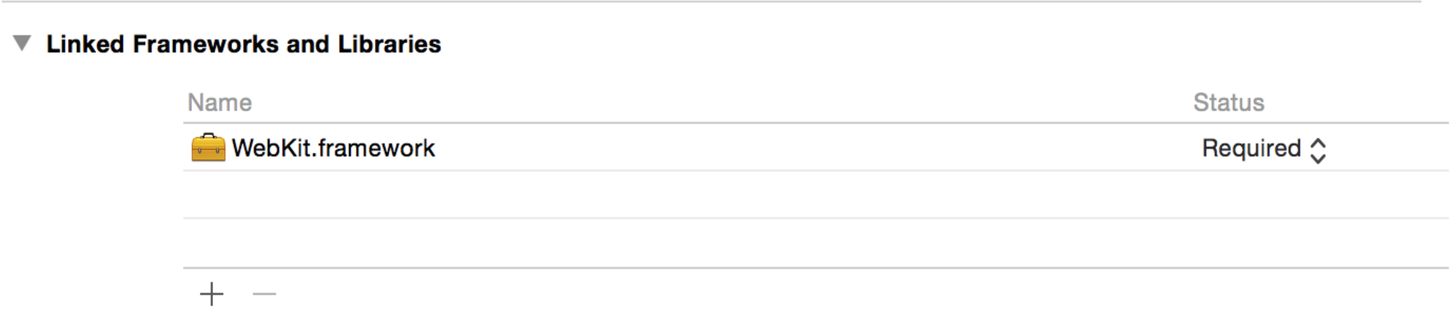
```
//
//  ViewController.h
//  CarGame
//
//  Created by Seng Hin Mak on 31/3/15.
//  Copyright (c) 2015 Makzan. All rights reserved.
//

#import <Cocoa/Cocoa.h>
#import <WebKit/WebKit.h>

@interface ViewController : NSViewController

@property (weak) IBOutlet WebView *gameWebView;

@end
```



Finished running CarGame : CarGame

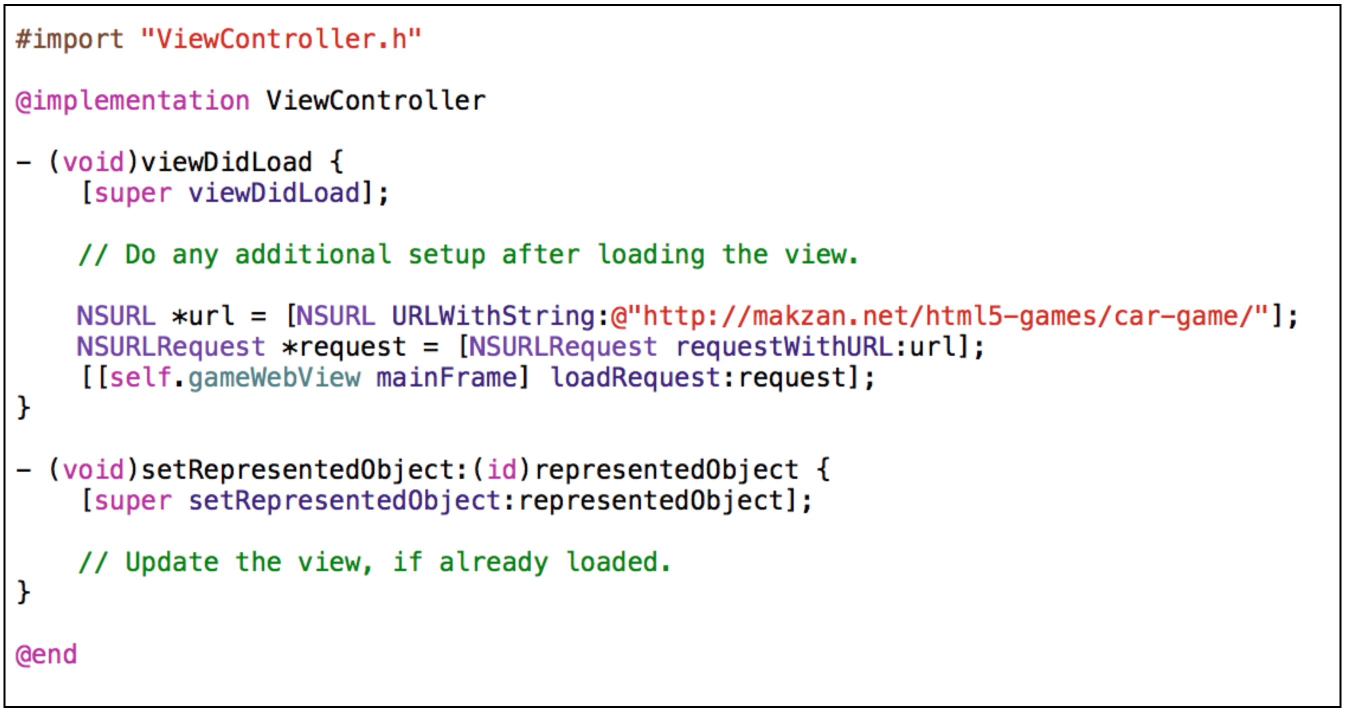
Choose frameworks and libraries to add:

web

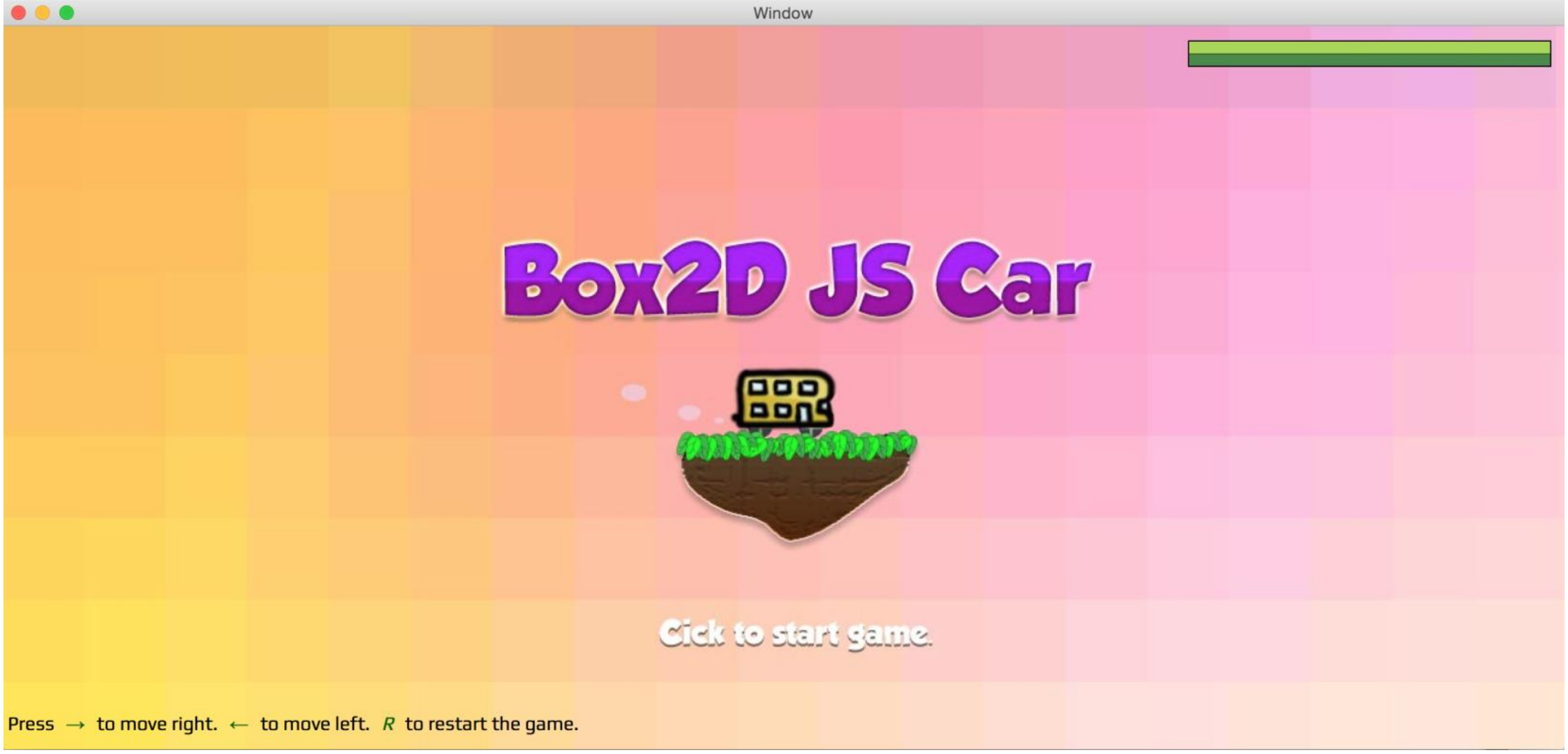


Linked Frameworks and Libraries

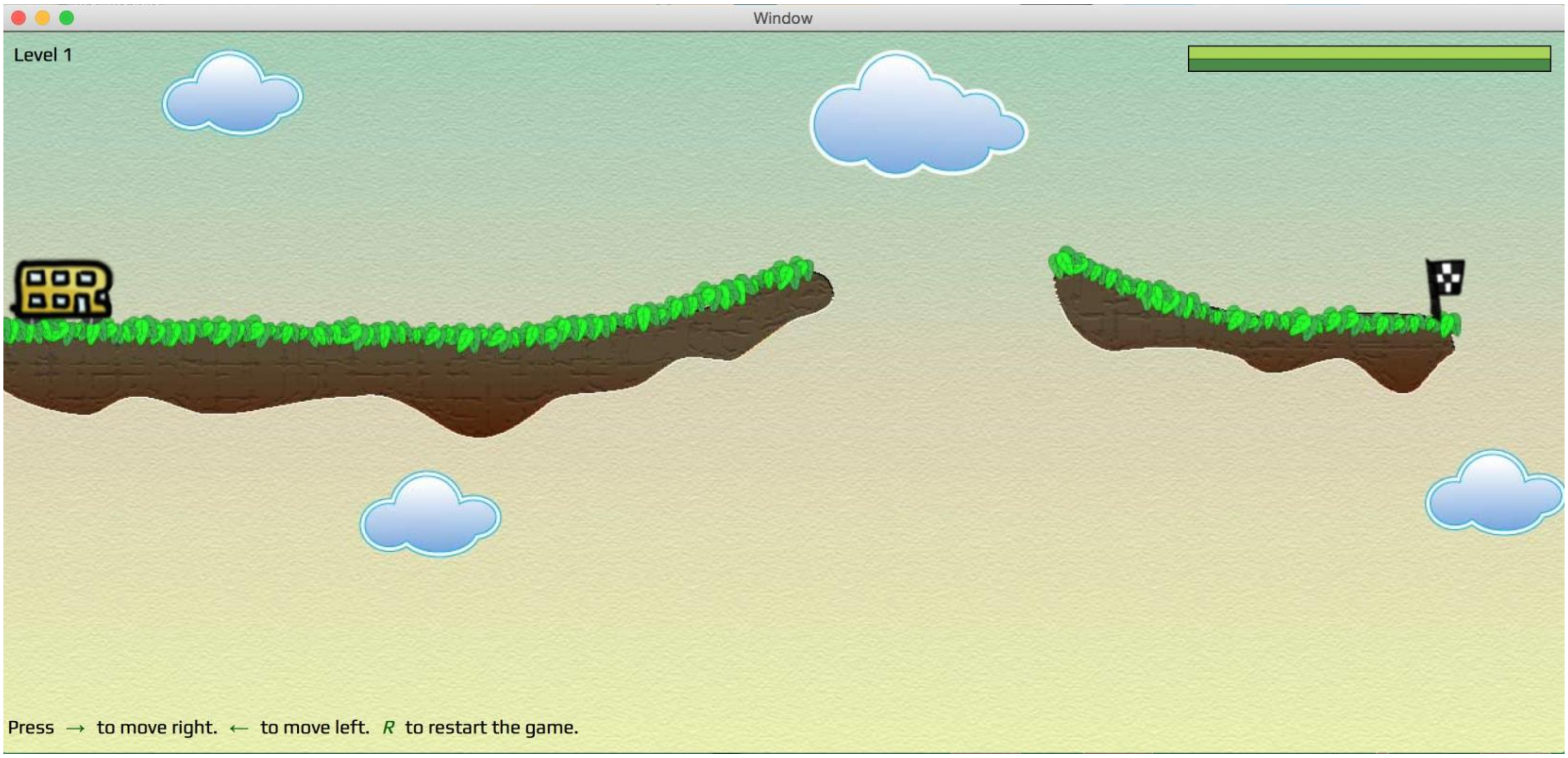
Name	Status
WebKit.framework	Required



```
#import "ViewController.h"

@implementation ViewController

- (void)viewDidLoad {
    [super viewDidLoad];

    // Do any additional setup after loading the view.

    NSURL *url = [NSURL URLWithString:@"http://makzan.net/html5-games/car-game/"];
    NSURLRequest *request = [NSURLRequest requestWithURL:url];
    [[self.gameWebView mainFrame] loadRequest:request];
}

- (void)setRepresentedObject:(id)representedObject {
    [super setRepresentedObject:representedObject];

    // Update the view, if already loaded.
}

@end
```

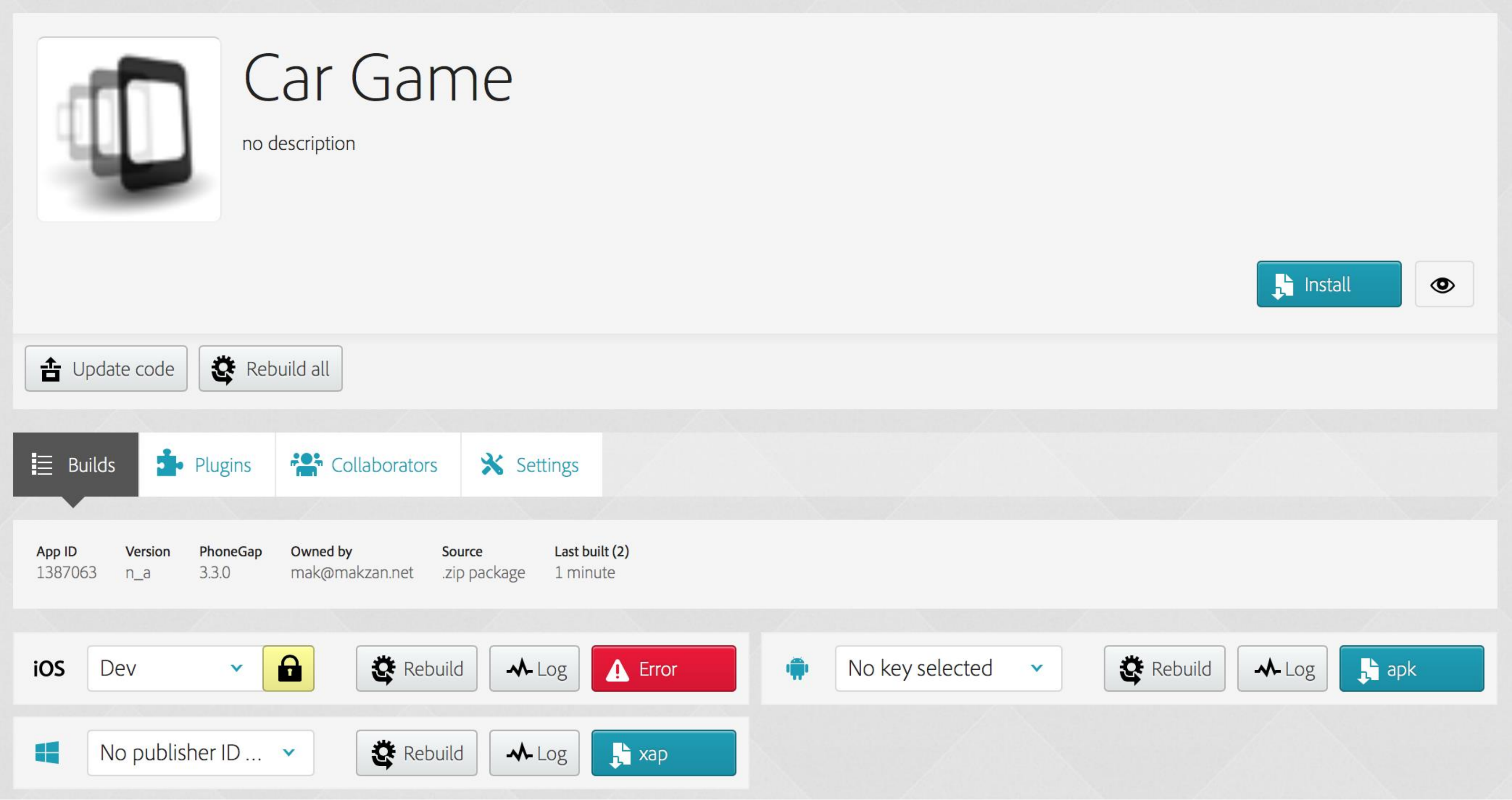


Press → to move right. ← to move left. *R* to restart the game.



Press → to move right. ← to move left. *R* to restart the game.

Building with PhoneGap build



Car Game

no description

App ID	Version	PhoneGap	Owned by	Source	Last built (2)
1387063	n_a	3.3.0	mak@makzan.net	.zip package	1 minute

iOS: Dev

No key selected

No publisher ID ...