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Author: Renaud BERTHIER

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1 PROJECT OVERVIEW

Revivor is an entrainment company specialized in all-times video games classic revivals. They have successfully been selling small gaming devices for TV sets for 3 years and wants to take the next step. Their previous product was a compilation of legacy video games like Pong, Pac-mac or even Space invaders.

Revivor now wants to launch a new product targeting middle-range PC's: a compilation of all-times games.

For this project, the Revivor executives have decided to outsource all game development to contractors. Each contractor will undertake the development of one video game of the collection.

Revivor not only wants the game collection to be a simple rewrite of existing games. They also want to add new features. The contract stipulates that each contractor must provide at least two innovative features to the game they rewrite. A network-based multiplayer mode would be greatly appreciated.

Your team has been chosen to rewrite the all-times classic "Arkanoid", the well-known brick breaker game. You'll also have to create the related website.

You have just two technical constraints: the video game must be developed with C language and running inside the website, using the brand new NaCl technology (Google Native Client).

2 FUNCTIONAL EXPRESSION

2.1 THE GAME

Breakout is a brick breaker game where the player must destroy bricks by sending a bouncing ball with a paddle. The paddle moves horizontally and is controlled by user's keyboard. The game consists of many generated levels in which bricks are disposed. User may go through each level by destroying all bricks in it. If the ball falls below the user's paddle, he loses a life.

The game begins with the ball placed on the paddle, with a slightly offset from the center. The ball starts bouncing by pressing the key "Up arrow" of the keyboard. Left and right arrow keys are used to move the paddle left and right. When the ball touches the paddle, its new bounce's angle is calculated. The farther the ball was from the center of the paddle, the more horizontal the ball's path will be.

Bonuses may fall vertically after a brick destruction and can change the paddle or ball behavior. To earn a bonus, the user must touch the bonus with his paddle. Here is the list of all bonuses:

- Increase paddle's size (maximum 3 from standard paddle size)
- Stick ball on the paddle (until lose)
- Clone ball (maximum 4 balls at the same time)
- Explosive ball, breaking all bricks around the touched one (until lose)
- Reduce speed (maximum 3 from standard paddle speed)

Of course, maluses could also apply the same way:

- Reduce paddle's size (maximum 3 from standard paddle size)
- Lose
- Increase speed (maximum 3 from standard paddle speed)

Bricks can have different types:

- One-touch breakable bricks
- Three-touch breakable bricks
- Unbreakable bricks

One-time breakable bricks can have various colors, but the others must have an easily recognizable texture.

2.1.1 GRAPHICS

You're free to use whichever graphic assets you want.

2.1.2 VIDEO RESOURCES

You can use the following links to get an impression of what the game should look like:

- <http://www.youtube.com/watch?v=uE8fPhR1dlc>
- <http://www.youtube.com/watch?v=TJlQYkg-Lno>
- http://www.youtube.com/watch?v=44rceRqY8_k

2.2 THE WEBSITE

The website will be the entry point of the game. As a result, it must be composed of at least:

- An "index" page explaining how to play
- An "about" page showing game concepts and development team
- A "contact" page with at least a way to contact the team (not working)
- A "connect" page to register with your booster ID
- A "shop" page to purchase bonuses usable in game

2.2.1 SHOP

The shop will contain the following articles:

- Maximum paddle size
- Minimum speed
- Stick ball for the first life
- Auto-stick ball
- Explosive ball for the first life
- Auto-explosive ball
- Double ball at game beginning for the first life
- Auto-double ball at game beginning

For this version, they are gratuitous and limited to ten each.

2.2.2 GRAPHICS

You're allowed to use any design you want, as long as it corresponds to the game ones and is sophisticated.

2.3 WEBSITE AND GAME INTERACTION

When a player purchases an article in the store, it must send an HTTP request to the application web service. This web service takes care about gamers' items list. This web service is contained inside a Virtual Machine accessible on <http://courses.supinfo.com/>

While running this virtual machine, you will find the web service documentation available at the following address:

[http://\[VM-IP-Address\]:8080/](http://[VM-IP-Address]:8080/)

At launch, the game asks the player to log in. After that, it must check this service to show all articles purchases by the player and a way to use them or dismiss. If the player uses some of them, it must send a request to the service to notify the item's use.

3 DELIVERABLES

Students should include the following elements in their final delivery:

- A zip archive with the project source code. The source code must also come with the build system used (Project file, autotools...).
- Project documentation, based on the template.

- Technical documentation explaining your choices and/or implementation choices/details on the following items (at least):
 - Graphic engine
 - Scrolling
 - Bouncing engine
 - Bonuses/malus handling
- Game manual

The first document is an academic document. Address the reader as a teacher, not a client. The last one (game manual) should address the reader as a user. These documents can be in French or in English, at your option.

4 GRADED ITEMS

The project will be graded as follows, on a 50/54 scale:

Documentation (2 points)

- Spelling and grammar (0.5 points)
- Relevancy (0.5 points)
- Technical documentation (1 point)

Graphics (7 points)

- Game aesthetics (3 points)
- Sprite animations (2 point)
- Bonuses and maluses animations (2 point)

Gameplay (17 points)

- The paddle can move left and right (2 points).
- The ball bounces depending of paddle impact (2 points).
- The paddle can grow and narrow according to limits (2 points).
- The ball can clone itself according to limits (2 points).
- The ball can have the explosive behavior according to limits (2 points).
- The ball speed can be increased or decreased according to limits (2 points).
- The ball can stick on the paddle according to limits (2 points).
- Bricks are destroyed (or not) depending of their type (3 points).

Website (16 points)

- Game graphics are respected (2 points).
- Design is sophisticated – Bonus if homemade (3 / 6 points).
- The index page shows asked information (1 point).
- The about page shows asked information (1 point).
- The contact page shows asked information (1 point).
- The connect page shows asked information (1 point).

- The shop page shows asked information (1 point).

Website and game interaction (11 points)

- The shop page allows purchasing items (3 points).
- The game retrieves player purchased items (3 points).
- Player can use an item (2 points).
- Item is removed from player's articles (3 points).

Bonus features (4 points)