Paddocks – Design Document

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# Section A – Project Goal

To re-create the pen-and-paper game **‘Paddocks’**, also known as **‘Dots and Boxes’**, in computer game form. The game will have its source code made public, and binaries will be made available on the Internet to be downloaded for free. Upon completion of the project, a demonstration video will be created and uploaded to YouTube.

The project will be developed during the month of October 2012, as a ‘create a game in one month’ challenge. The goal is to have it completed before or during the first week of November 2012.

# Section B – Game Rules and General Gameplay

*Wikipedia explanation:* [*http://en.wikipedia.org/wiki/Dots\_and\_Boxes*](http://en.wikipedia.org/wiki/Dots_and_Boxes)

**In the pen-and-paper version of the game,** the playing field starts with an empty grid of dots. This grid can be of any size. Players take turns drawing a vertical or a horizontal line between two unjoined adjacent dots. A player who completes the fourth side of a 1x1 box earns one point and takes another turn. Typically, to record the **owner** of that box, an identifying mark such as the player’s initial is placed inside the box. This continues until no more lines can be placed. The winner is the player with the most points.

**In this version of the game,** the dots will be represented visually by wooden posts perpendicular to the ground. Connections between two posts made by a player will be represented by a wooden fence. Completed boxes (referred to as **paddocks** herein) will have their owners identified by placing an animal representative of the player within the paddock. Some yet-to-be-decided additional visualisation to make the owner more recognisable will also occur, such as perhaps a change in the surrounding fences’ colour. A numerical score value for each player will also be displayed on-screen.

**Turn order** will be decided at random initially – a player will be selected at random to go first. For further matches between the two opponents, turn order will alternate. In other words, the person who had their turn second in the previous match will have their turn first in the new match.

Note that players must make a valid move for their turn to end; **it is not possible to skip your turn**. Game strategy can be created around this rule.

# Section C – Features

The game will include the following modes of play.

1. Player vs. Computer – The player can play against a computer controlled **Artificial Intelligence (AI) opponent**.
   * Ideally, multiple levels of difficulties will be available, where the computer opponent will play smarter on harder difficulty levels.
2. Player vs. Player (local) – Two players can play against each other **using the same computer**.
   * The simplest way to do this would be for both players to share the one mouse.
3. Player vs. Player (online) – Two players can play against each other **using separate computers**.
   * The two computers would be connected to each other via an Internet connection. One player assuming the role of the **host**, and the other player the **client**. The client would connect to the host, and once a connection has been established, the game will begin.

# Section D – Options and Settings

Aside from the difficulty of the computer opponent (mentioned in section C), the player will be able to adjust the following options which alter the gameplay.

1. Size of the playing field – The playing field can be made smaller or larger.
   * The minimum size will be a 3x3 grid of boxes. The maximum size is to be determined at a later date, but will probably be around 8x8 or so. The playing field could also be set to a rectangular value, for example 6x3.
2. Player identification – The player will be able to select a unique identifier for themselves.
   * This will be in the way of an animal and/or a colour. For example, player 1 being a sheep, while player 2 is a pig.

The player will also be able to adjust audio and video settings from the game’s Options menu.

1. **Audio** – Volume adjustment for sound effects and background music. Setting the volume level to the lowest setting will cause that type of audio to be muted.
2. **Video** – At the least, these options should be available.
   * Window Mode or Full Screen.
   * Screen resolution (e.g. 1280x720).
   * Particle effects – Either a **low** or **high** setting can be selected.
   * Shadows – **On** or **off**.

# Section E – Menu Screens

Layout of the game’s menus will be as follows:

1. Main Menu
   * Player vs. Computer
   * Player vs. Player
   * Tutorial
   * Options
   * Credits
   * Exit
2. Pre-match menu (referred to in other parts of the menu screens description)
   * **[Player vs. Computer only]** AI Difficulty – combo box (e.g. Easy, Normal, Hard)
   * Playing area size – combo boxes for **width** and **height**.
   * Player identifiers – choose which player uses what identifier.
   * Start game – button. When clicked, turn order selection takes place at first (refer to section A for turn order information). Then, the game begins.
3. Upon selecting **Player vs. Computer**
   * Pre-match menu is displayed.

1. Upon selecting **Player vs. Player**
   * Local – Both players use the one computer and mouse.
   * Online – Players connect via the Internet.
   * Upon selecting **Local**
     1. Pre-match menu is displayed.
   * Upon selecting **Online**
     1. Player name – Player can enter their name.
     2. Host – Once selected, display an input box to allow the user to set the **port** (a default port will be selected, but the user can change this), as well as a **Listen** button. After clicking Listen, start waiting for other player to connect.
     3. Connect – Once selected, display input boxes for **IP address** and **Port**, as well as a **Connect** button that when pressed, the game will attempt to connect to the host.
     4. If the connection is established **successfully**
        + Pre-match menu is displayed.
     5. If an **error occurs**
        + A detailed message should be shown to the user if possible.
2. Upon selecting **Tutorial**
   * A tutorial sequence should play that introduces the game’s rules, and teaches the user how to play the game, what HUD elements mean, etc.
3. Upon selecting **Options**
   * Available options will be as per section D. All options should fit within the screen, so that the user is not required to go through multiple screens to change different settings.

* + Appropriate buttons should enable to user to either **Save** or **Discard** the changes. Saved options should be written to a configuration file so that they can be reloaded the next time the game is open.

1. Upon selecting **Credits**
   * A screen should appear with credits information, with a link to the developer’s website, with a button to return to the main menu.
2. Upon selecting **Exit**
   * A yes/no confirmation dialog box should appear before closing the game.
3. After a game has been completed
   * Display winner and scores
   * Play again – Play the same game mode again.
   * Main menu – Return to the main menu.

# Section F – In-game HUD

Items to be displayed on the in-game HUD are as follows:

1. Player name (if playing the Online mode)
2. Each player’s score
3. An indicator of which player’s turn it is currently
4. Number of turns left until the winner is decided

# Section G – Sounds and Music

A **sound effect** should play in various situations throughout the game.

1. Clicking on a **Graphical User Interface (GUI) element**, such as a menu option, a confirmation button, etc. Placing the cursor into an input box should not have a sound effect.
2. Placing a fence successfully
3. Clicking to try to place a fence in an invalid location
4. Creating a paddock
5. At the end of a match (a different sound depending on whether the player won or lost the game)

**Background music** should be something easy to listen to, that sounds like it matches the visual environment that the user sees before them. The song should also not get boring too quickly. Seeing as this is a simple game, and that matches may only go for a few minutes each, one good song that can be played throughout the whole game – while on the main menus, as well as during play – would be the most suitable choice. This way, the player is not annoyed by frequent changing of background music.

# Section H – Playing The Game

When it is their turn, the player will be able to place a fence at a position by placing the mouse cursor in the gap between two fence posts, and clicking the left mouse button.

When the mouse cursor is hovered over an area between two posts:

* For **valid moves**, a translucent fence should appear in the place that the fence will be placed, to denote that a fence can be put there. After clicking to place the fence, the translucent fence will change to become solid, and the turn will be completed.
* For **invalid moves**, i.e. a fence exists in that position already, the mouse cursor should change to have an unfilled red circle with a diagonal red line through it, placed on top of the cursor, to denote that a fence cannot be put there. Clicking the mouse button to try to place a fence at this location should do nothing.

The player’s turn ends only after they have made a valid move; i.e., if they tried to place a fence in an invalid location, this action does not cost them their turn. As per the game rules state in section B, if the player created a paddock, they get another turn and are able to place another fence immediately.

# Section I – In-game Tutorial

The in-game tutorial will walk the player through the game. The tutorial will be interactive – explaining to the player what’s going on; then telling them what to do and letting them do it.

The tutorial will cover at least the following:

* How turn order is determined
* How to place fences using the mouse
* How to score points by creating paddocks
* When the game ends and how the winner is determined