

UNIVERSITY OF WASHINGTON BOTHELL

# PIRATES VS NINJAS

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## CURSE OF THE MOUNTAIN FORTRESS

User Manual and Game Specifications

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## TABLE OF CONTENTS

User Manual .....	2
Objective: How do you win? .....	2
Controls: How do you play? .....	2
Common Controls .....	2
Arrow Keys .....	2
Tab .....	3
The “D” Key .....	3
The “Z” and “X” Keys .....	3
Deployment Mode: Enabled .....	3
Hotkeys 1-7 .....	3
Deployment Mode: Disabled .....	4
Hotkeys 1-7 .....	4
Numerical Hotkeys and Their Corresponding Buildings .....	4
Gameplay Tips .....	5
A Tower With No Pirate Does Nothing .....	5
Your Fortress Has No Cannons .....	5
Multiple Pirates Make Towers Fire Faster .....	5
More Than Five Pirates In A Tower Does Nothing.....	5
Pirates Take Travel Time .....	5
A Pirate In Motion Remains In Motion.....	5
Design Specifications .....	6
The Character Object.....	6
Geometry Schematic .....	6
Data Structure Diagram .....	7
Evaluation .....	8
Known Bugs .....	8
Limitations .....	8
Future Versions .....	8

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## USER MANUAL

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This Section of this document will provide you with all the background knowledge and control information required to enjoy *Pirates vs Ninjas: Curse of the Mountain Fortress* (hereafter abbreviated as *PvN*).

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### OBJECTIVE: HOW DO YOU WIN?

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You are a mighty pirate who has amassed a great deal of treasure hidden away in your mountain fortress. The Ninjas, your mortal enemy, have grown extremely jealous of your wealth and wish to steal it from you. Your job is to defend your treasure hordes at all cost. The enemy may seem relentless, but I promise you if you hold out long enough they will give up and go home.

You must utilize your established towers to fight off the ever increasing attacks by the ninja horde. If a ninja breaks through your defenses, he will either steal some of your gold or set off an explosion in your fortress. You reckon that your fortress can withstand nine such explosions, but if you let a tenth ninja through, expect to find yourself in Davey Jones' Locker soon enough.

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### CONTROLS: HOW DO YOU PLAY?

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The primary way to interact with *PvN* is through the keyboard. Reading the following sections should tell you all you need to know about how to direct your pirates and stave off the attacking ninjas. If you need a reminder while playing the game, you can always click the "How To Play" button which will pop up a window with the same information. The game will be paused while this window is open, so you need not fear being overrun while trying to remember which key enabled deployment mode. First up, the common controls.

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### COMMON CONTROLS

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#### ARROW KEYS

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These are the cluster of keys on your keyboard with an up arrow, a down arrow, a left arrow, and a right arrow. Not to be confused with any arrows that may be painted on your number pad or ten key. On most keyboards this cluster of keys is located below and to the right of your main Return/Enter key.

The Arrow keys will move your main view around the mini-map, giving you a zoomed in view of the action at that spot. You may also click with your mouse on the mini map to drag this main view around.

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#### TAB

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The tab key, located to the left of “Q” on most QWERTY designed keyboards, will cycle your active tower. There are seven towers on the map, and pressing tab will advance your active tower from the current to the next, in a cyclical loop. When your active tower is changed, your main view will automatically move to be centered on that tower. Thus, hitting tab is an easy way to get a zoomed in view of each of your towers.

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#### THE “D” KEY

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This is perhaps the most important control in our game. The “D” Key toggled Deployment Mode. Without going in to Deployment mode, you won’t be able to send out your pirates to your towers, and will be easily overrun by the ninja hordes.

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#### THE “Z” AND “X” KEYS

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These keys control the rotation of your active tower’s cannon. By holding one of these keys down, your cannon will rotate in that direction: Z to the left (or counter-clockwise) and X to the right (or clockwise). You do not need to rapidly press these keys, holding them down will keep the cannon rotating until you let up on the key. Keep in mind however, the cannons have a finite range in which they can rotate, and attempts to hold one of these keys down when the cannon is already rotated to the max will have no effect.

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#### DEPLOYMENT MODE: ENABLED

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All controls described above this section act exactly the same whether you have deployment mode on or off. All controls in the following sections however, act in one of two ways depending on which mode you are currently in. Whether you have Deployment Mode Enabled or Disabled is always displayed in the lower left corner of the screen, in the “Tower Info” box.

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#### HOTKEYS 1-7

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These keys are the standard number keys above the qwerty line on a QWERTY keyboard. These are not the number pad or ten key keys. Pressing the numbers 1-7 on the number pad will have no effect.

While Deployment Mode is Enabled, pressing one of these keys will attempt to deploy a pirate from your currently active building, to the building represented by that number. If you wish to change your active building with Deployment Mode Enabled, you can do so by pressing Tab, or by first Disabling Deployment Mode with “D”, changing your building, and then Enabling Deployment Mode with another press of “D”. For a reference on which number corresponds to which building, please see the image at the end of this section.

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DEPLOYMENT MODE: DISABLED

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Remember that you can toggle Deployment Mode, and thus the behavior of these hotkeys, at any time by pressing the “D” key.

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HOTKEYS 1-7

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With Deployment Mode Disabled, the numbers 1-7 serve as a shortcut to making the specified building your active building. The numbers are assigned to the buildings starting at the bottom, and going left to right. For a graphical representation of how these numbers are assigned, please see the screenshot at the end of this section.

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NUMERICAL HOTKEYS AND THEIR CORRESPONDING BUILDINGS

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Please refer to this screenshot for determining which number corresponds to which building. Forgive the out-of-date graphics in the screenshot. This document went to press before an updated screenshot could be obtained. Those responsible have been keel-hauled.

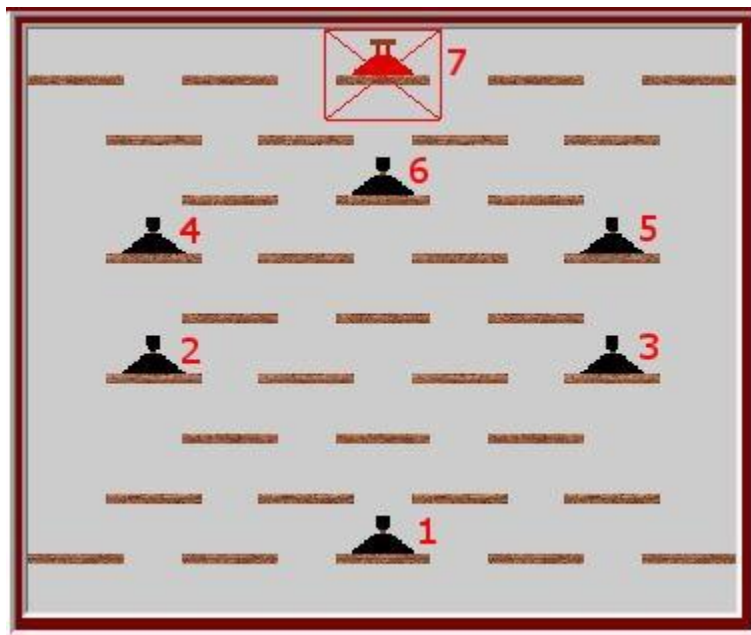


FIGURE 1 MINIMAP SCREENSHOT WITH NUMBERED TOWERS

## GAMEPLAY TIPS

While figuring out how to win is one of the joys of playing a game like this, here are some helpful hints and basic principles that will hopefully not spoil the journey for you.

## A TOWER WITH NO PIRATE DOES NOTHING

Without a pirate stationed in a tower, that tower cannot fire. Thus, you should never be relying on a tower to stop any ninjas until you put at least one pirate in it.

## YOUR FORTRESS HAS NO CANNONS

Your Fortress is where all your pirates begin their lives. Your Fortress also has nothing for these pirates to do. Thus, to be successful at *PvN*, you must deploy your pirates out to a tower as soon as possible.

## MULTIPLE PIRATES MAKE TOWERS FIRE FASTER

While it only takes one pirate stationed inside a tower to enable that tower to fire, having more than one in the same tower will make that tower fire faster, up to a maximum of five.

## MORE THAN FIVE PIRATES IN A TOWER DOES NOTHING

While multiple pirates in the same tower is a good thing, because it makes that tower fire faster, having more than five pirates does absolutely nothing. The sixth, seventh, or eighth pirate is not pulling his weight and doing nothing to help defend your fortress.

## PIRATES TAKE TRAVEL TIME

When you send a pirate from one tower to another, it will take him some time to reach that new tower. This means you need to plan ahead on where to put your pirates, because they are not fast enough to react to sudden changes in where you want your cannon balls to fly.

## A PIRATE IN MOTION REMAINS IN MOTION

Newton's First Law. When you send a pirate to another tower, you cannot interfere with his behavior until he reaches his destination. Because of this, you need to be absolutely sure you want to send that pirate away, and suffer the travel time it will take, because once he's gone you can't simply call him back.

## DESIGN SPECIFICATIONS

### THE CHARACTER OBJECT

Both our Pirates, and our Ninjas inherit from the same Character object. The only real difference between them is in their coloration.

#### GEOMETRY SCHEMATIC

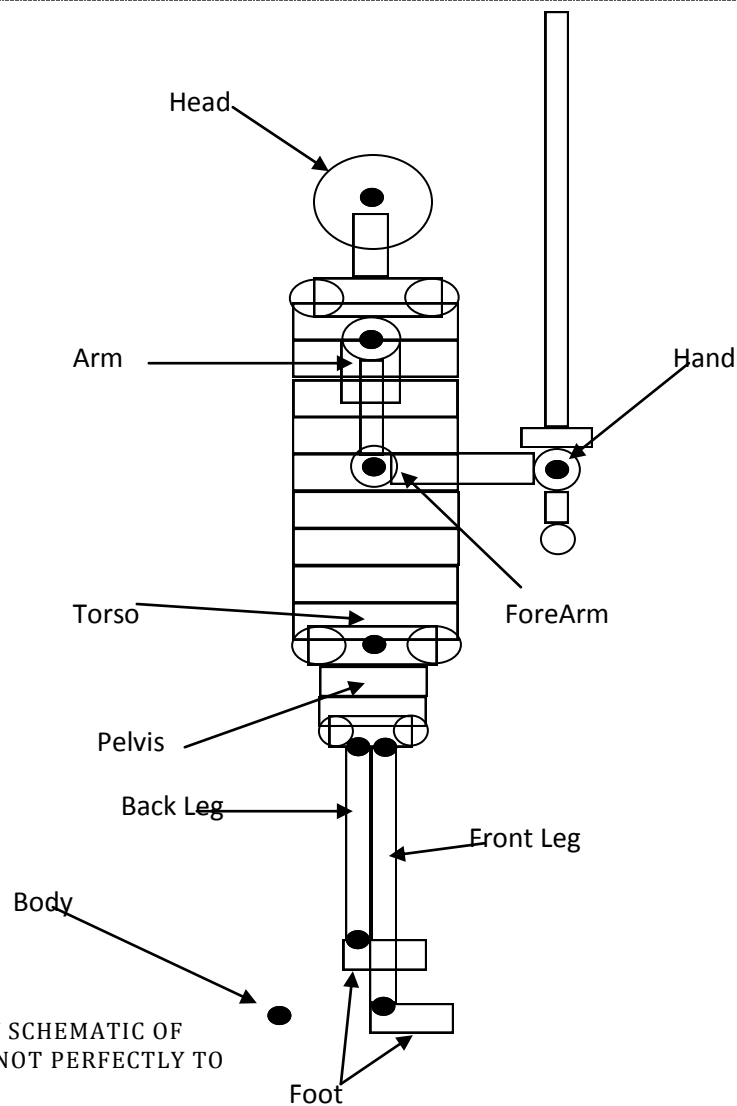


FIGURE 2 GEOMETRY SCHEMATIC OF BODY SCENE NODE (NOT PERFECTLY TO SCALE)

In this extremely crude schematic of our Character's geometry, the solid black circles represent the pivot points for their respective scene nodes. The detached pivot point is the one used for the entire body.

## DATA STRUCTURE DIAGRAM

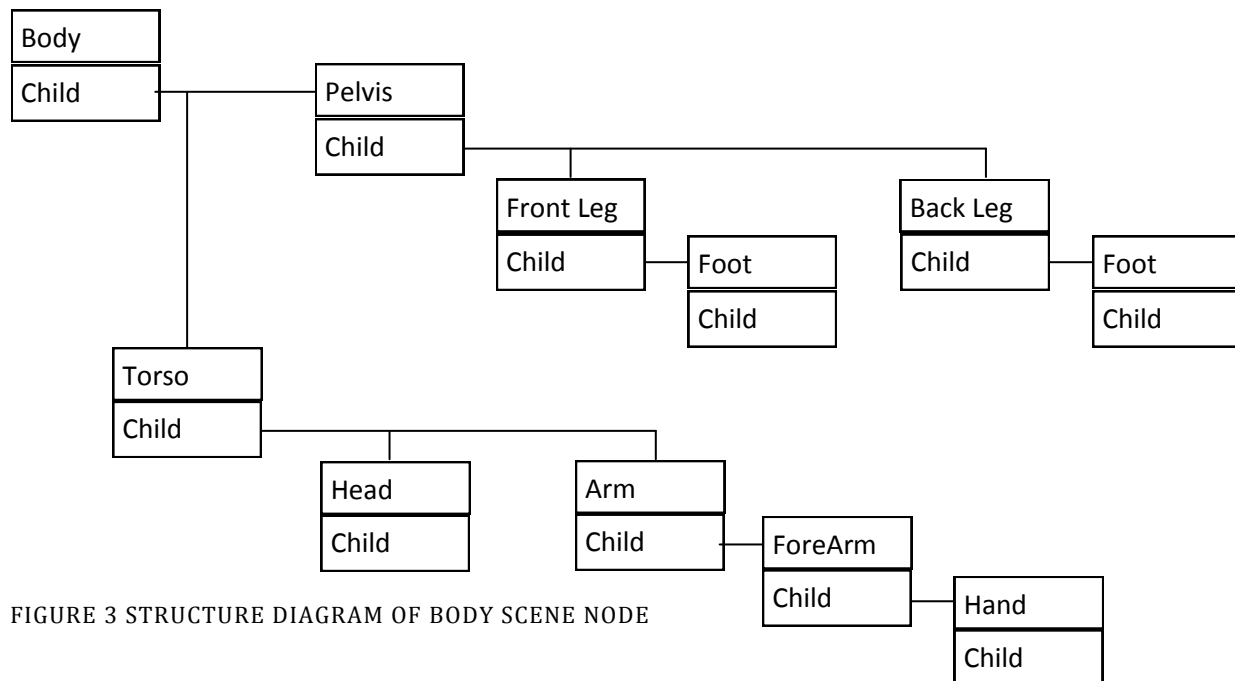


FIGURE 3 STRUCTURE DIAGRAM OF BODY SCENE NODE

This diagram shows the way our scene node objects are interrelated and structured to make up our character's body. Each Character object has a reference to a body object which contains all of its art. Each body part inherits from Scene Node, and has a primitive list housing all the rectangles and circles which make up the geometry seen in the previous diagram.



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## EVALUATION

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From the onset this was a rather ambitious project given the limited time frame. While a number of desired features didn't make it in to the final build, overall we are very happy with the feature set that we have delivered.

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## KNOWN BUGS

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Sporadic behavior has been observed regarding the drawing layers of certain MFC elements. In Particular, the frame around the text displaying the status of Deployment Mode has occasionally been drawn over the text itself, rendering it impossible to tell which mode you are currently in. Changing this text (by changing the mode with the hotkey) causes the Enabled/Disabled text to be drawn, correctly, on top of the frame again. We can't currently establish the circumstances leading to this phenomenon, as we have been unable to reliably reproduce this bug.

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## LIMITATIONS

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One key feature mentioned in our proposal that ended up being cut from the final build is collision between ninjas and pirates. Due to certain other design decisions along the way, the sheer number of ninjas in the world towards the end of the map would make it impossible for a player to safely deploy pirates between towers.

A second feature that got implemented well enough for game play but not as well as we would like is collision between cannon balls and the ninjas. Currently, cannon balls test for collision with the bounding box of a ninja's scene node, which due to a number of factors is considerably larger than the ninja's actual primitive art bounds would be. This can occasionally lead to circumstances where a Ninja is killed by a Cannon Ball that appeared to have missed them.

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## FUTURE VERSIONS

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One key element that we never implemented but would like to is an exploding particle system for when a cannon ball is destroyed. Our cannon balls have a finite life in order to limit the firing range of any individual tower. When our cannon balls are removed from the world due to reaching this lifespan, as opposed to hitting a ninja, it can lead to some confusion as an otherwise perfectly flying cannon ball suddenly just disappears.

The other key feature to implement in future versions is new maps. The way we developed our map system it would be possible, though not entirely easy, to add new map designs and pathing and have the game rotate between maps as the player beat them.