Test Report

Ongoing Bug Log

This is a list of bugs we kept as we were going along, so that we had a list of bugs we knew needed to be fixed in the game. Once they had been fixed we marked them as corrected.

Date Tested	Added By	Problem	Defect(D) Enhancement(E)	Corrected
08/02	Dave	A star not finding optimal path	E	Y
08/02	Jordan	Line of sight method not working correctly	D	Y
10/02	Jaeren	Enemies walk through and paint walls	D	Y
11/02	Jaeren	Pickups are being over-wrote by enemies	D	Y
15/02	Zoe	Player dying at health 5	D	Y
18/02	Jaeren	When player dies pickups are being drawn in wrong position	D	Y
22/02	Dave	Enemies not targeting a player after he has respawned	D	Y
22/02	Zoe	Enemies spawning on top of each other and then cannot move	D	Y
22/02	Zoe	Enemies not targeting players that were on the far left of the map	D	Y
24/02	Jordan	Enemies still shooting a player that was already dead	D	Y
26/02	Jordan	Players do not walk to end position at end of the wave	E	Y
26/02	Zoe	Negative enemy count on bank and city map	D	Y
27/02	Jaeren	Enemies do not follow there own path	D	Y
28/02	Dave	Players re-spawning and then instantly dying	D	Y
28/02	Jordan	Enemies spawning on the far left and not moving	D	Y

01/03	Jordan	IP's showing wrong on screen	E	Y
01/03	Jordan	Character doesn't display for client	D	Y
01/03	Jordan	Game Panel does not display for clients	D	Y
01/03	Jordan	Client recieves many out of order packet exceptions	D	Y
01/03	Jordan	Null pointer exception in peer reciever	D	Y
05/03	Jordan	Online players not respawning	D	Y
05/03	Jaeren	Enemies only targeting the host online	D	Y
07/03	Dave	The wrong player respawning (the host) when another player dies	D	Y
15/03	Dave	Players not correctly walking to the next map on multiplayer games	E	Y
16/03	Jordan	Some players advancing map, while others didn't online.	D	Y
17/03	Jaeren	Some (not all) characters are not being deleted across the network	D	N
19/03	Zoe	Severe lag in online mode	D	N
19/03	Zoe	All players disconnect when host starts a game	D	N
19/03	Jordan	No timeout when trying to join a game that you aren't on the same network	E	N
19/03	Dave	Arrowhead not pointing in the correct direction	D	Y
19/03	Dave	Arrowhead throwing an exception that stops the rest of the draw method	D	Y
20/03	Dave	Arrow to other players not pointing in the correct direction online.	D	Y
21/03	Jaeren	Sound doesn't play on clients computer across the network	E	Y
21/03	Jaeren	Pickup created packets are not being sent	D	Y

Penetration Testing

These are specific test cases we took to try and break our game, when the game was

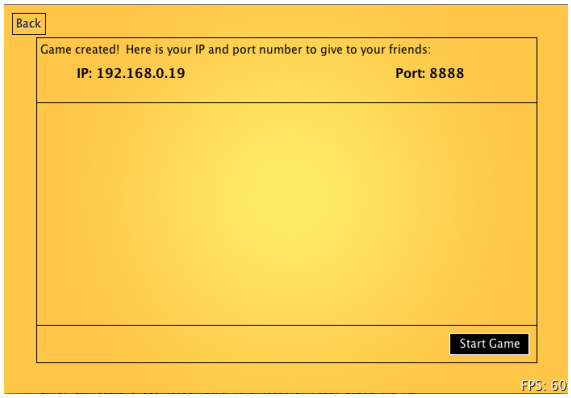
finished.

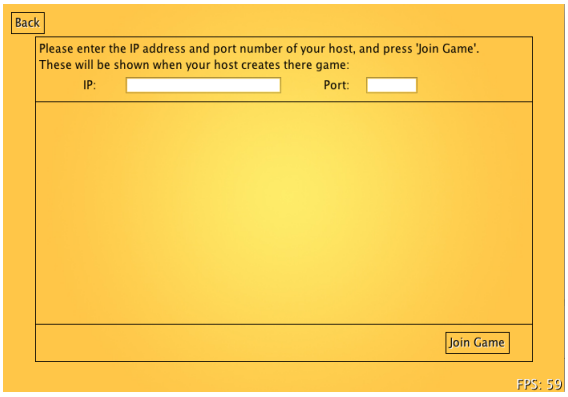
Date Tested	Test	Expected Outcome	Correct	Defect(D) Enhancement(E)	Corrected
15/03	Walk to left of the map and hold left	Should not be able to move - and no exceptions should be thrown	Y	N/A	N/A
15/03	A star search with no target	Enemy should not move	Y	N/A	N/A
17/03	A star search with two players	A star should target the closest player	Y	N/A	N.A
17/03	Enemy's target is dead	Enemy should not shoot	Y	N/A	N/A
20/03	Draw an arrow to a teammate that is dead	Arrow should not display	Y	N/A	N/A
01/03	Walk up to another player and try to walk through him	Player should not be able to move through the other player	Y	N/A	N/A
05/03	Walk up to an enemy and try to walk through him	Player should not be able to move through the enemy	Y	N/A	N/A
10/03	Shoot at another player	Other player should not take damage and the bullet should pass through him	Y	N/A	N/A
18/03	A star search for 30 enemies simultaneously on bank map	All enemies should find their target	Y	N/A	N/A
18/03	A star search for 30 enemies simultaneously on city map	All enemies should find their target	N	E - Added a timeout for searches that take too long	Y
18/03	Wave finishes on single player game and new map needs to be loaded	Players should all walk to the exit on the map and then go onto the next map.	Y	N/A	N/A

18/03	Wave finishes on multiplayer game and new map needs to be loaded	Players should all walk to the exit on the map and then go onto the next map.	N	E - This feature was too buggy therefore we disabled it on multiplayer games	Y
20/03	One player quits from an online game	All players should quit out of the game and be shown the disconnected screen	Y	N/A	N/A
20/03	The host goes to the main menu after all players are connected to a game	All players should be shown a disconnected screen	N	E - The player leaves the game from the lobby, however a game could not be started, as the host is not there to start the game	Y
20/03	Typing in a wrong IP	User should be shown a timeout message	N	E -Doesn't timeout	Y
20/03	Typing in your own IP	You shouldn't be allowed to connect to yourself	N	E -Allows you to and does not play	Y
20/03	Trying to join lobby with no internet connection	Should show error message	N	E -Gives you an exception	Y
20/03	Quitting an online game and then starting a single player game	Should play just like a normal single player game	N	D -Enemies do not try and shoot you	Y
22/03	Shooting an enemy in the corner of the player	Should result in the enemy losing health	Y	N/A	N/A
22/03	Start a single player game, then quit and play an online game	Should result in online game playing fine	Y	N/A	N/A
22/03	Create a wave with 200 enemies	Enemies should gradually enter	Y	N/A	N/A

Usability testing

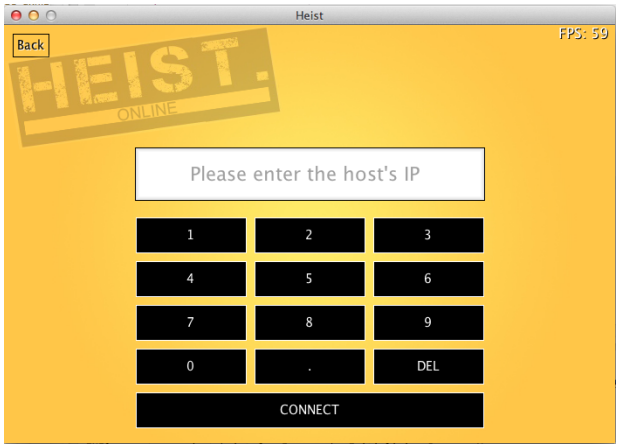
On the 27th of February a number of groups met up and tested each others games. When we showed off our game, we also asked their opinion on the usability of the system. Our main areas of interest were ease of starting a single player game, host or join a game, and seeing useful information while playing. This was what the game looked like, when we gathered our feedback.

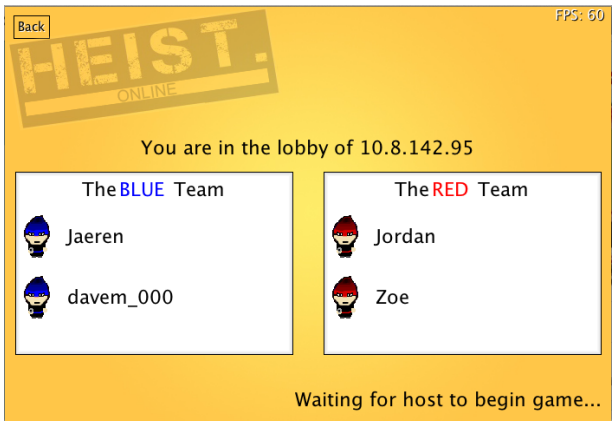


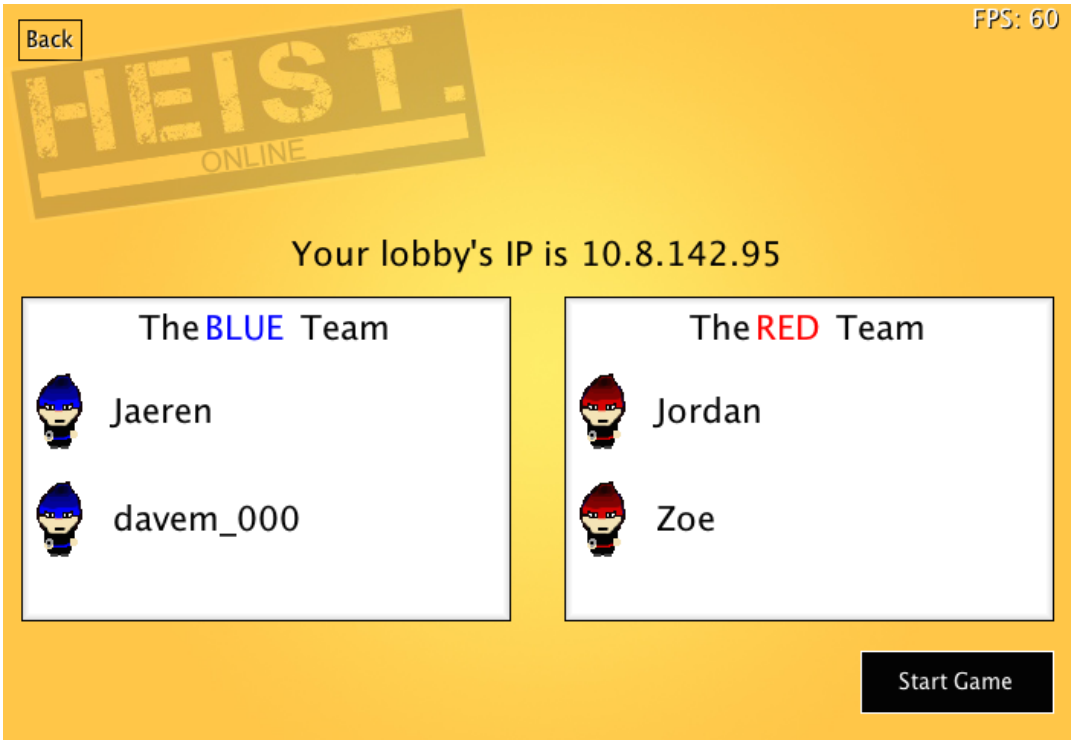


The general response was that the game info panel was too big and took up too much of the screen. A lot of people did not like the way they had to host and join a game, they found that the text fields were too small, and that they did not know see why the user had to enter what port the game is on, when it was hard coded to create on port 8888.

Taking this feedback into account for the final version of the game, we have moved the game info panel to the bottom of the screen, and is now much smaller, but still holds all the information. The host and join panels have now changed to add a bigger text field, and also an on screen keyboard for people who find that easier. The port is hard coded, so users do not have to enter that information, for those who do not know what it is. This is what the new User Interface looks like:







Unit Testing

We created a number of JUnit tests which were used throughout the development of our game, to test that our main functionality still works while we are making changes to other

aspects of our program. Here is a list of the different types of JUnit tests we carried out and there purpose:

Collision Detection

Our collision detection tests were to make sure that you could never go enter a gridSquare that was marked false. We created two different types for Player and Enemy movement
EnemyMoveTest.java - Tests an enemy making 10,000,000 random moves around the map and then removes him. It then compares that collision map with a freshly made collision map. If they are different that means he has moved into a false square and painted it true
PlayerMoveTest.java - Testing the same but for player movement.
BulletTest.java - Checking that creating and moving bullets never create an exception

Network Packets

To send our networking packets we have to pack them into a byte array, then when we recieve them we unpack them back into our own object. Therefore to make sure we are packing them and unpacking them correctly, we create two packets pack one, and then unpack another into another packet. We then check they are the same, and if they are then then our pack and unpack methods are working. The packets that we test are (BulletArrayPacket, CharacterDiedPacket, ConnectRequestPacket, PeerListPacket, PeerPacket, PickupCollectedPacket and PickupCreatedPacket.

Objects Testing

Pickups - To test our pickups we made sure that they were always being generated in bounds, and on squares that were true and were accessible to the players. If it throws an ArrayIndexOutOfBoundsException or is generated in a false grid square, then the test has failed, else it has passed

Integration Testing

We first created our entire single player game, so that we had an entire module that we knew worked, and that our core functionality that was tested in our JUnit tests worked. We then started to create our online game.

We used the SVN from the start of the project, so that all of our work was integrated. Apart from at the start when we created our individual prototypes, which needed to be integrated together, all of our work was integrated instantly. We made sure we only committed pieces of code that worked, so that progress of our other team members was not limited.

When creating our online game we then added pieces of functionality gradually so that we knew which piece was causing the problem. Once we had our single player game, we added online play with just two players moving around the map and updating the collision map. Once we successfully implemented this feature we then managed to send bullets across the network, so that players could shoot. We then added enemies, that would be sent from the host. Lastly pickups were added and our entire game was mapped into online play.