TIME BENDERS

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GAME MANUAL

Build Instructions

Sonia - Simple Instructions

Time Benders uses the sound library Sonia to handle all of its sounds. In order to install Sonia simply install it from [this link](#) and install it as you would any library for Processing.

Sonia - Detailed Instructions

1. [Download Sonia](#)
2. Extract the .zip folder
3. Copy the "Sonia_#_#" folder into "/Processing/libraries/" (#s simply denote the version number)
4. Run Time Benders!

The game runs slowly!

Because of the amount of effects and calculations going on (such as particle effects, random seed calculations, lots of collision detection, writing and reading from files, etc) Time Benders may run slowly on slower processors. The most common cause is the scrolling background used in the main game. To remove the scrolling background go to the *main* file and find the line *scrollingBack.display();* which should be no further than 40 lines after *void draw()*. Now simply add two backslashes before *scrollingBack.display();* so it looks like *//scrollingBack.display();*.

Here is a screenshot of the change.
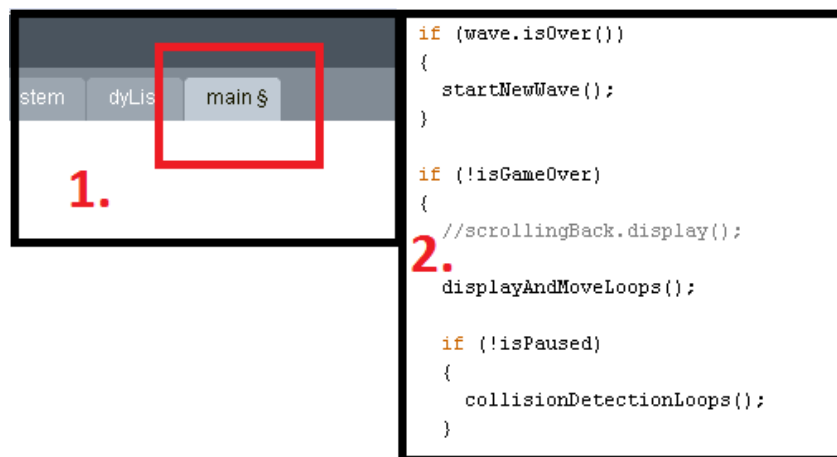
Now just save and run the game and it should be running much smoother!

Note: Time Benders must be run normally and *not* from Present Mode. Time Benders uses its own method for full screen, windowed and resolution modes and Present Mode is not needed or supported.

Overview

Time Benders is a fast-paced, wave-based, arcade shooter that has you blasting through asteroids to build up high scores and in-game currency. The objective is simple: survive the oncoming waves of asteroids for as long as possible. Once your ship is inevitably destroyed the game is over. However, There is a small addition of complexity. You have three different bullet colours available which must match the asteroid you're shooting at. If the colours don't match the asteroid will not be destroyed.

Like any good arcade game it is based on high scores and leaves the frills of story and static game overs behind.

Beyond the core concept Time Benders also adds a few more mechanics to aid your venture to the top of the high scores. At your disposal is the ability to freeze time. Once you accumulate enough time freeze charges you are able to release them and carelessly wade through the asteroids destroying them and collecting the minerals they drop. In correlation with your ability to freeze time you also have 8 unique power ups available for purchase with the minerals you collect. Power ups from rapid fire to deployable floating mines are purchasable from the in-game store to further help your fight.
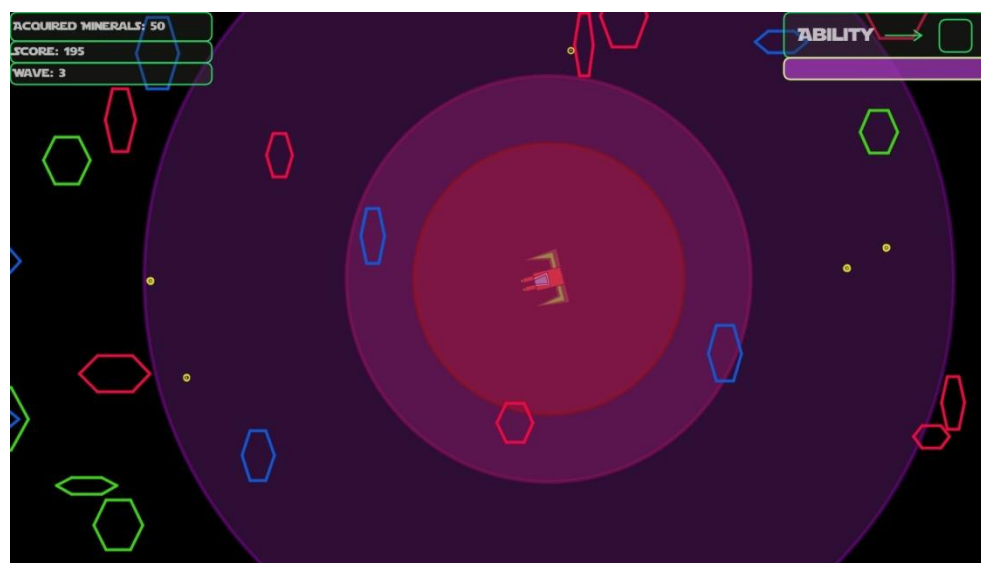
Controls

|	
Up, Right and Left Arrows	Movement
Down	Brake
Left or Right Shift	Use Power Up
W	Green Bullet
A	Red Bullet
D	Blue Bullet
S	Store Open/Close
E	Use Time Freeze Charge
V	Save Game
Num 1 - 8	Quick Buy Keys
ENTER	Skip Intro/Credits, Submit High Score Name

Walkthrough and Guide
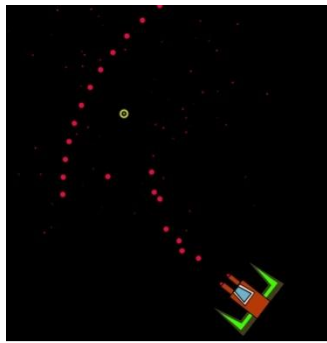
Heads Up Display:
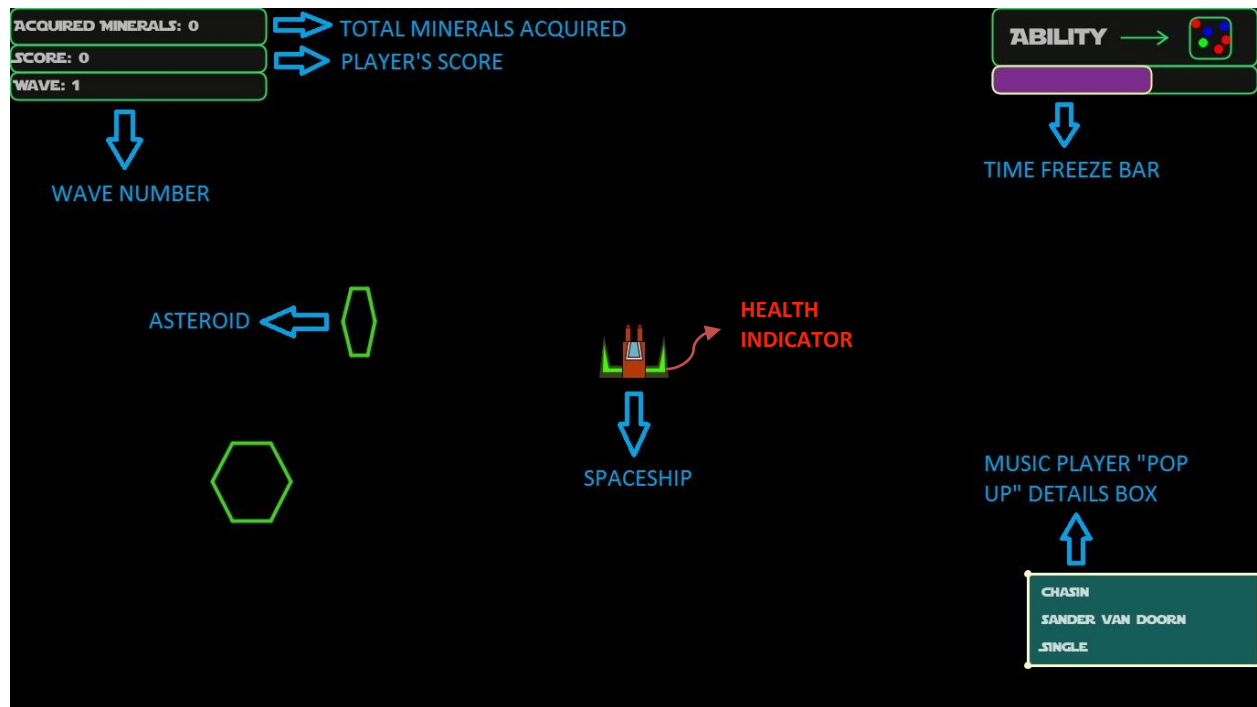
Time Freeze Ability:

Main Ability in the game. Freezes all objects for a period of time. Can be used once the time freeze bar is full.
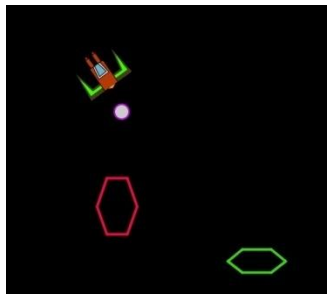
Power Ups:
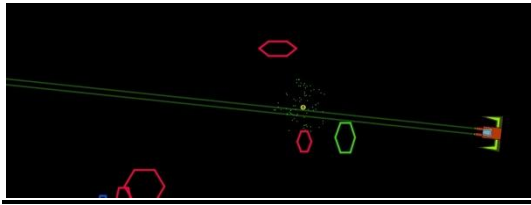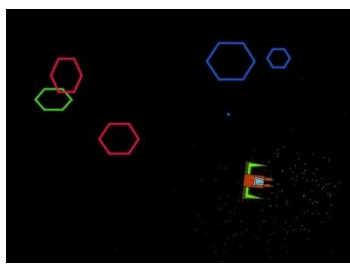

Laser Pointer is used for higher accuracy.

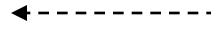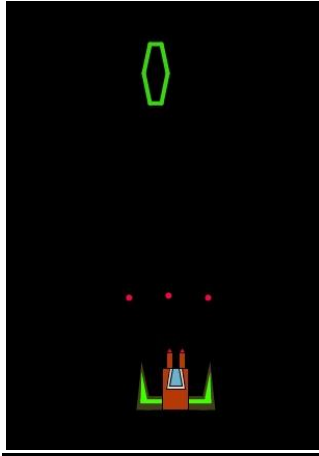**Rapid Fire** is used for increasing the rate of fire.

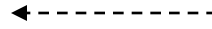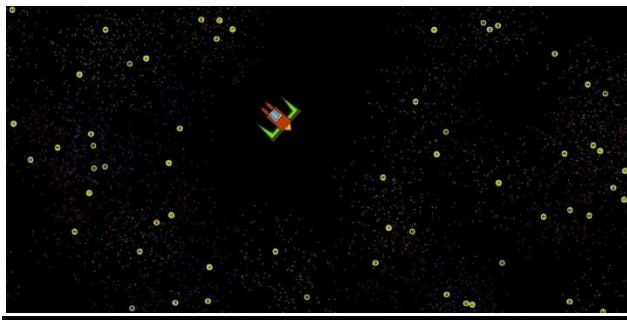**Mine** can be planted anywhere on the screen for an asteroid to collide with.

RGB Bullet destroys any coloured asteroid.

Rock Seeker acts like a heat seeker. When shot, it finds the nearest *same coloured* asteroid and destroys it.

Spreader shoots three bullets at once in different directions.

Super Nova destroys all the asteroids in the wave.
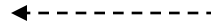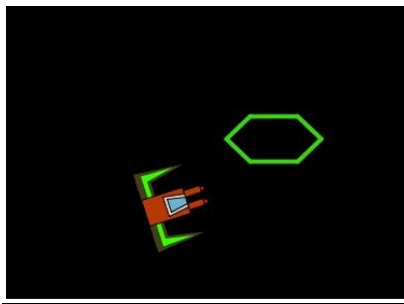
Insta Brake stops the spaceship as soon as the brake button is pressed.

Time Benders is a game about experimentation and has no concrete winning state. This removes any objectively superior strategy but there are some things to consider which may improve your chances of obtaining the high score.

Tips:

- Spend your minerals wisely. Depending on the situation you find yourself in you'll have to decide whether to continue saving for the more expensive power ups or use a more affordable one in order to continue surviving.
- Use Supernova to farm minerals. If you've been able to get a large quantity of minerals or find yourself in situations with many asteroids it may be worth buying Supernova in order to farm the minerals and score faster. It destroys everything on screen and will

allow you to quickly collect the minerals afterwards filling up your Time Freeze bar and increasing your total amount of minerals faster. Chain them together for an even larger bounty!

- Practice with Laser Pointers. They can be helpful for getting used to the speed and trajectory of bullets in relationship to your ship. Since the bullet will follow the pointer parallel (assuming you're still) you can have an easier time becoming accustomed to the bullet path. Laser Pointers are fairly cheap and may be worth using for your first few playthroughs.
- Take your time. There's no need to rush and especially when you're first learning the controls and getting a feel for the ship movement it's good to slow down by tapping brake and gas to travel at a slower pace. This way you will be able to dodge asteroids easier and be a helpful precursor to dodging at higher speeds with more asteroids on screen.
- Experiment. Time Benders has a small but varied bunch of power ups and gameplay options allowing you to find a game style that you enjoy. So try every power up with and without freezing time, and see what happens. The high score awaits!

Playtesting Reports

Playtesting was very helpful in our efforts to make the game as playable and as appealing to players as possible. When issues were brought up repeatedly we made efforts to fix them while keeping our design goals at the focus.

Many of the original reports claimed that there was not enough player choice and that controls were difficult. The ship was said to be too fast or hard to control and that ramming asteroids had no repercussions on the player beyond a health decrease. Players did however believe that their goal was clear and they enjoyed the originality of the bullet to asteroid colour matching as well as the endlessness of the wave system.

In our next update we fixed up some of the control issues by slowing the ship down and implementing a system to allow multiple key presses to be read and acting upon at the same time.

In the next wave of reports we had some who were confused about controls thinking that it was broken while others mentioned how well the controls felt. Certain elements such as the health bar being on the ship were not apparent to all play testers. The ship moving mechanic seemed to be received well. Several mentioned the lack of penalty for ramming again. Many requested that each bullet colour has a dedicated button to switch.

Following this update we once again reworked some controls. We added dedicated bullet switches and removed duplications of controls that did the same thing to remove confusion. We also removed mineral drops from asteroids that had been rammed and not shot. This way the player was punished for ramming.

In the final batch of play tests we received minor issues with screen size affecting gameplay. We did however have a handful of play testers who were pleased with the tightness of the controls while only a minority still had trouble.

For our final fixes based on play tests we added a resolution option to allow for different monitor/resolution sizes to be supported and made sure the controls were as tight as we could make them.

Implementation

We used a number of unique algorithms for calculations in Time Benders. We had to add a way to grab multiple key presses and register them, calculate ship angle on turning, read and write to files for config, save state and high scores saving and loading, required a special timer and many more. These were built as we needed them and in retrospect some planning beforehand may have been helpful. Our focus on aesthetic design also required quite a bit of class and inheritance structure in order for things to remain clear and relatively modular.

AI Logic is very simple. Asteroids are spawned and created randomly in one line of code that sends information to the constructor. We create a number of random floats (which are all limited by us) and then sent to the Asteroid constructor which creates a new object with a random colour, size, speed and direction. This allows us to have a random game but balanced game each time.

Collision detection is another big part of Time Benders and was something we *did* plan from the start. We created a base structure called Obj which holds x, y, width and height. We then inherited all objects requiring collision from this object. Then we created a collision check function which takes two Objs and checks to see if their points overlap anywhere. This only works on rectangle collision boxes but they can be fit to any shape (though long angled shapes would pose a problem if attempted). We went with this as it is one of the simplest and quickest forms of collision and pixel accuracy wasn't required.

Design Notes

When we initially started development, asteroids were one of our first priorities. Balancing their speed and size was fairly easy and luckily proved to be of no issue. We made sure their size was maxed at a point where it was clearly visibly larger than other asteroids without taking up an unnecessary amount of screen real estate. Their minimum size was set to be easy to see while providing a bit more challenge to hit. Speed took a bit longer as asteroids moving too fast can cause an annoyance for the player. Slow asteroids don't have this problem as they can simply be seen as a settling point in the speed of the game and let the player take an easy shot. The speed was a trial and error process to make sure the asteroids weren't colliding unexpectedly with the player or going too fast to react to.

The ship speed we had a bit more trouble with but thanks to the play testers we were able to find a speed that was not too fast yet not too slow. The addition of braking made this even easier as the player was now expected to slow themselves down to an extent.

Reflection

Happy Thoughts

We are both extremely happy with the way Time Benders turned out. From concept to development to our final product, it gave a lot of headaches but was very much worth it in the end.

Some of our favourite aspects of Time Benders are…

- The Main Menu and Menu interaction. The system for adding the menu turned out to be very easy to work with and incredibly modular. Adding new sub menus was as simple as constructing a new Menu and adding a few update functions. This made the creation of the Main Menu relatively painless.
- Multiple key press registration. When we started with the ship movement it was very difficult to control. Only one press was registered at a time by Processing so you were unable to turn and move forward. With someone as simple as adding to an ArrayList we were able to register many keys at once.
- Time Freeze Bar/Power Up Timer. These two timer displays are simple implementations but were very satisfying to complete. They overlay the Power Up equipped or the Time Freeze Bar with a tinted timer that gives the player a visual but non-numeric representation of the time remaining.

- Asteroid spawning. Having asteroids be created dynamically based on a random seed was very accomplishing and adding a lot to our game. A level based game just wouldn't have worked well with the arcade feel but having the asteroids endless and random feels very right.
- The Music Player. The music player was a late addition but one that turned out very well. It displays the current song playing when a new song begins. It also avoids repeats and when the playlist is over it starts again with a new random order. Plus it looks really cool!

More Time for Time Benders

One Power Up that I personally (Scott) have regrets of my inability to cram in is turrets. I always have loved using turrets in video games from the first time I got to use the turret glove in Ratchet and Clank: Going Commando. I was hoping we would have time to implement turrets in some way but sadly we didn't have time to draw them so implementation was definitely not going to happen. If we had even one more week I would have made sure they got in there! Another Power Up Hrishi had in mind was something like the Spartan Laser from Halo. The Spaceship would have charged up and shot an extremely powerful laser blast that would have destroyed every asteroid in its path. Unfortunately we did not have enough time to implement that either.

Turrets and the Spartan Laser were the only things on our checklist that didn't get done. From our original plan to every subsequent additional idea was implemented successfully otherwise.

Bug Report

- You are unable to run the game in Present Mode or it will crash immediately. Present Mode is no longer needed however as we have our own implementation of full screen.
- You cannot Export as Application regardless of whether Run in Present Mode is checked.

External Credits

Art Assets

http://www.universe-beauty.com/albums/space/Star-field-hubble-deep.JPG

http://win8art.com/uploads/posts/2012-09/1347713418_2560x1600.jpg

http://minorplanetcenter.net/blog/wp-content/uploads/2012/01/Green-Lantern-flying-through-asteroids.jpg

Fonts

http://font.cc/421-Star-Jedi.ttf.html

http://www.dafont.com/space-age.font

http://www.dafont.com/ultimate-midnight.font

http://www.fontsaddict.com/font/firefight-bb.html

Sound and Music

We do not have specific links to sounds but they were downloaded from http://www.freesound.org. All sounds were heavily edited afterwards.

http://www.beatport.com/track/fire-breazze-original-mix/1582812

https://soundcloud.com/adamk/in-a-mirror

http://www.youtube.com/watch?v=2WPCLda_erI

http://www.beatport.com/track/lick-the-rainbow-original-mix/1834862

http://www.beatport.com/release/language/892088

http://www.beatport.com/track/everyday-netsky-remix/2082889

http://www.beatport.com/track/chasin-original-mix/3486018

http://www.youtube.com/watch?v=Dz1J2SRIcdo

Internal Credits

	Design	Implementation	Documentation
Hrishi Mukherjee	70%	40%	40%
Scott Andrechek	30%	60%	60%

Thank you for playing Time Benders! We hope you enjoy playing it as much as we enjoyed making it.