Product Documentation 1

He Jiang, Julius Martinez, Lewis Williams, Samuel Love, Tianyu Ji,
Tom Wells, Vlad Postmangiu Luchian, Yandong Guo

Contents

Installation guide - Developer

This guide demonstrates how to get DungeonCrafter set up for development within the IntelliJ IDE. The guide explains the prerequisites required along with how to configure IntelliJ to run the LibGDX project.

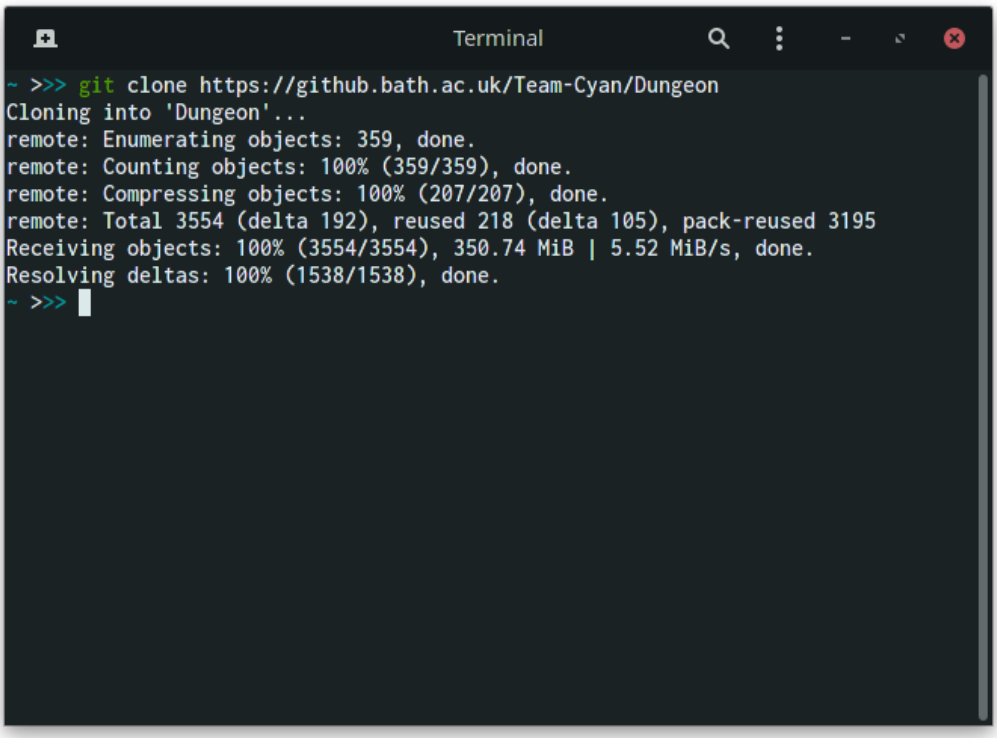
Installing JRE8:

In order to compile the code, JRE 8 is required, this can be downloaded from the link here

Installing GIT:

In order to copy the code to your personal machine, GIT is required, GIT can be downloaded from the link here, alternatively you may install it using your preferred package manager on Linux.

To copy the project files from the GIT repository to your local machine run ‘git clone’ followed by the project directory (https://github.bath.ac.uk/Team-Cyan/Dungeon) which can be accessed here. This will create a folder named ‘Dungeon’ with all project files inside.

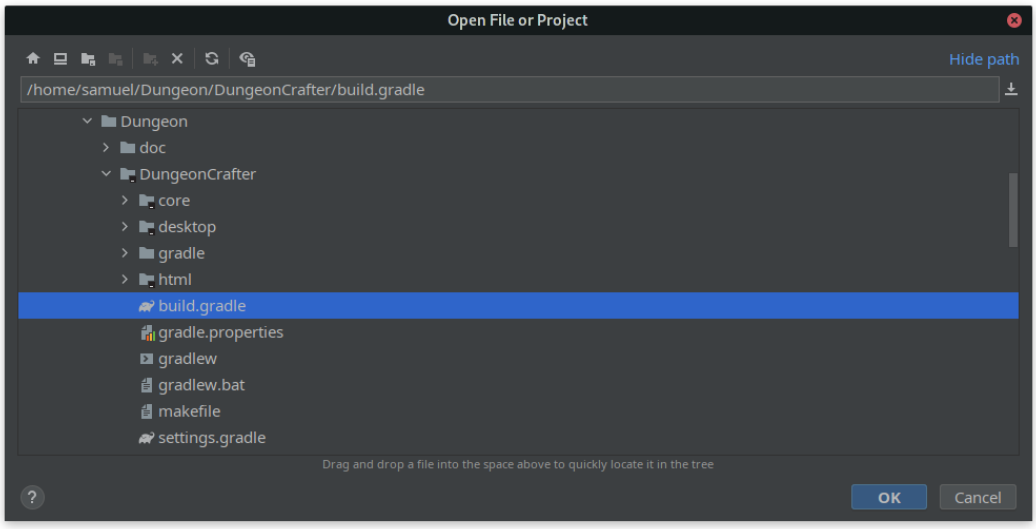


Installing IntelliJ:

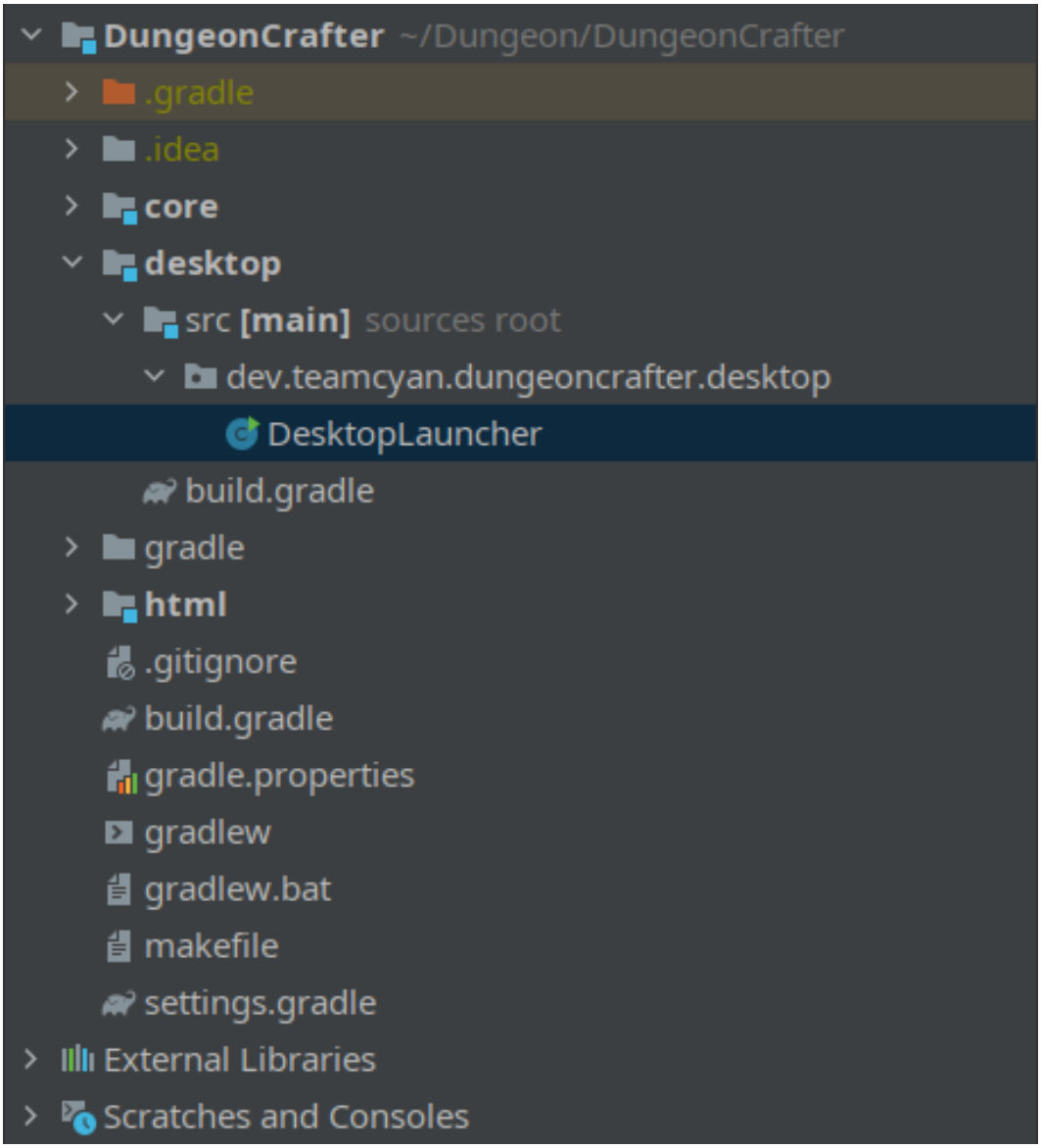
The IntelliJ IDE can be downloaded from the link provided here

Configuring IntelliJ:

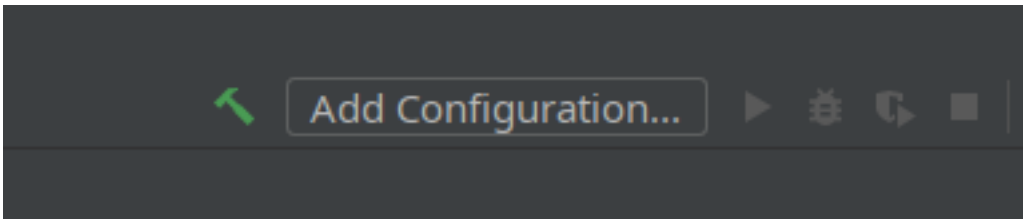
Select open file or project within IntelliJ and navigate to the file 'build.gradle' within the folder DungeonCrafter.



Once the project has opened navigate to and open the 'DesktopLauncher' file within 'desktop/src . . . '



Once the file is open within IntelliJ, a run configuration need to be created to instruct IntelliJ on how to run the project. Select the 'Add Configuration' box to add a new configuration.



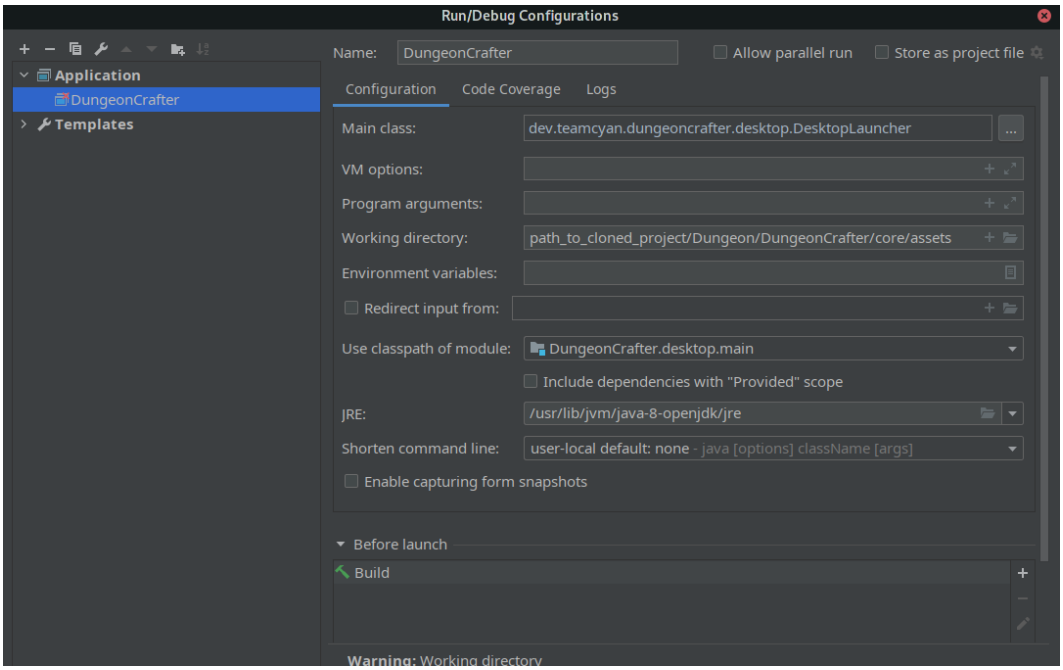
Select DesktopLauncher as the main class from the drop down list.

The working directory needs to be set to the 'assets' folder within the DungeonCrafter folder.

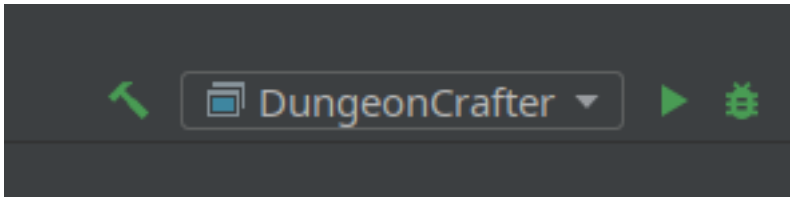
Select 'DungeonCrafter.desktop.main' from the 'use classpath of module' dropdown menu.

Select the installation location of the Java Runtime Environment Version 8

Click 'Apply' or 'Ok' on the bottom right of the configuraton window



Once this has been completed, the add configurations button will be replaced with the configuration that has just been created. To run the code, click the green triangle to the left of the DungeonCrafter configuration. To debug the project, select the green bug to the right of the green triangle.



Installation Manual - User

Cross platform compatibility was at the heart of this project. To achieve this we used Java and LibGDX.

The team agreed that given more time we would have looked into porting this to HTML and mobile.

Notes

Links

- releases page is the SSO for our application releases - please alway use the latest version

Depenedency

- !!! It is very important to use JRE 8 !Link to the official repository!

Linux and MacOS

1. Download and install JRE 8 for your Distro
2. Download the latest `DungeonCrafter-v1.0.jar`
3. Open a terminal at this location
4. Run `export JAVA_HOME=$(/usr/libexec/java_home -v 1.8)` to set your JRE to 88
5. Run `java -jar ./DungeonCrafter-v1.0.jar` to play the game

Windows

1. Download and install JRE 1.8 for your Distro
2. Download the latest `DungeonCrafter-v1.0.jar`

3. Go to `Start -> Control Panel -> System -> Advanced`
4. Click on Environment Variables, under System Variables, find PATH, and click on it.
5. In the Edit windows, modify PATH by adding the location of your jdk8/bin directory to the beginning. If you do not have the item PATH, you may select to add a new variable and add PATH as the name and the location of the directory as the value.
6. Close the window.
7. Reopen Command prompt window, and run java -version to test if the version has changed
8. Open a terminal at the location of your download
9. Run `java -jar ./DungeonCrafter-v1.0.jar` to play the game

Maintenance Guide

Into the dark is a Java programme based on the libGDX framework.

Prerequisites

- Java Development Kit 8+ (Must be JDK)
- libGDX

The only direct prerequisite needed to contribute to the game is libGDX. All the indirect prerequisites needed to setup libGDX (including JDK) and extensive set up guides for several IDEs can be found here. We highly recommend following libGDX's setup guides before moving on.

Getting the sources

Follow your preferred cloning process of a git repository. This is the link to the git:

`https://github.bath.ac.uk/Team-Cyan/Dungeon.git`

Project organization

Make sure to satisfy all the prerequisites before moving on.

Javadoc can be found here.

Introduction

libGDX comes with a predefined structure optimized for multiplatform development. In this project, this structure is represented inside the DungeonCrafter directory. Two kinds of subdirectories exist: platform-specific directories (highlighted yellow in the directory screenshot) and a logic directory (highlighted red in the directory screenshot). Platform-specific directories only consist of code specific to the respective platform, while the logic directory holds all the project's actual platform-independent logic. The platform-specific code accesses the logical code and makes it accessible to the respective platform. For more information on platform-specific setups in libGDX, refer to libGDX.

Platform support

Into the Dark is currently set up to only work on Desktop. You find all the desktop-specific code in DungeonCrafter/desktop. If you want to extend the game to work in a browser or on iOS or Android, please refer to libGDX's guides.

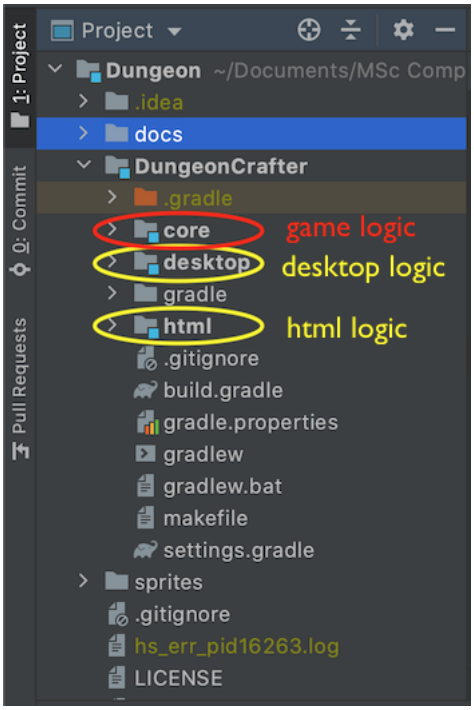


Figure 1: directory screenshot

Game Logic - MVC

The game logic is found in the DungeonCrafter/core directory. The game is structured by the Model-View-Controller pattern (MVC) according to this libGDX's specific MVC-guide. The controller logic of the game is found in the DungeonCrafter file. The view logic of the game is spread over several classes in the screens directory. The model logic of the game is spread over several classes in the classes directory.

- /core(/src/devteamcyan/dungeoncrafter)
  - /classes (MODEL)
    - GameModel.java
    - GMap.java
    - GEPlayer.java
    - ...
  - /screens (VIEW)
    - BaseScreen.java
    - MainMenuScreen.java
    - MainMenuScreen.java
    - ...
  - DungeonCrafter.java (CONTROLLER)

Controller The controller holds the current game model, the audioManager, KeyListener, and assetManager. Furthermore, the controller takes care of initializing and changing between all the game screens. If a new game screen is set up, it needs to be initialized in the controller.

View The view logic is spread over several screen classes. Depending on the current location in the game, a different screen is active. There is an abstract BaseScreen class, from which all the other screens inherit from. New screens have to inherit from BaseScreen.

How to add a new screen

1. Create new class inside the screens directory.
2. Make sure the class inherits from BaseScreen.
3. Make sure the class overrides the following methods: (init(), draw(), keyDown(), keyUp(), keyTyped(), touchDown(), touchUp(), touchDragged(), mouseMoved(), scrolled(), pause(), resume(), hide())
4. Go to DungeonCrafter and initialize the new screen in the loadScreens() methods like the other screens.
5. Switch to screen by calling changeScreen(NEWSCREEN.class) on your controller instance.

Model The model logic is spread over several classes, but all the information will be held by a GameModel instance. The map, the player, the sidekick pebble, and enemies originate here. Therefore, if you want to add enemies to the game, change positions of any character, etc. this is the class to go to and make the according changes.

GMap - level Map The structure of the GMap is based on a layered approach. There is a foreground layer, a background layer.

Note:

- Reverse gravity blocks are added to the background layer.
- The properties of each block are embedded in their respective tiles
- The tiles are not embedded into the map to keep them lightweight. Rather, they are linked at run time using libGDXs capabilities
- We recommend you use Tiled Map Editor if you want to create your own levels.
  - probably the best way to do so would be to copy one of our maps and then modify it

You can find the GMap and some other tests and examples in ./core/assets/tile

---

Further Modules and extensions

GMap Generator The game's GMap implementation was thought in such a manner to allow for further extensions with a GMap Generator. But like all projects, we were constrained by time and resources and this has sadly remained a nice //TODO

- The current GMap implementation was thought around the ease of integration with a procedurally generated map
- Using a lightweight wrapper to the libGDX TiledMap this can be done efficiently and with no high resource needs
- Research has led to a few conclusions which should be considered when implementing the map generator
  - the map generator should not be completely random, as this would not produce the wanted result
  - there should be rules which tell the generator how many blocks can be one next to another, and of what type

- a good implementation would be to use a gradient noise generator algorithm like Perlin Noise
- a great implementation would take into account the level's difficulty.
- due to the use of the native libGDX, the map can be generated live during the game, so in theory it should be able to create an inifinite map. The format in which the map is saved is lightweight as well `.tmx`

Audio Management For a nicer gaming experience, Into the dark includes audio. The audio is managed by the AudioManager class. It differs between background music and gameplay sound effects. - Add new music: 1. Add sound file to DungeonCrafter/core/assets/sounds directory 2. Add new Music variable to class like this: `public Music newMusic;` 3. Initialize it with music file from assets in the Constructor like this: `this.newMusic = Gdx.audio.newMusic(Gdx.files.internal("sounds/newMusic.*"));` 4. Play music by calling the controller's audioManager instance like this: `controller.audioManager.startMusic(controller.audioManager.newMusic, intentedVolume);` 5. Stop music by calling the controller's audioManager instance like this: `controller.audioManager.stopMusic(controller.audioManager.newMusic);`

- Adding new sound effects:
  1. Add sound file to DungeonCrafter/core/assets/sounds directory
  2. Add a new Sound variable to class like this: `public Sound newSound;`
  3. Initialize it with sound file from assets in the Constructor like this: `this.newSound = Gdx.audio.newSound(Gdx.files.internal("sounds/newSound.*"));`
  4. Add new logic to `startMusicStr()` like this: `if(toPlay == "__uniqueSoundIdentifier__"){newSound.play();}`
  5. Play sound effect by calling the controller's audioManager instance like this: `controller.audioManager.startMusicStr("__uniqueSoundIdentifier__");`

Physics Into the dark's physics are implemented from scratch. The same laws are applied to all characters, but movements are dependent on different conditions. Therefore, every character class (e.g. GEPlayer, GEPebble, GEEnemy, etc.) has its own position setters. In detail, x-coordinates and y-coordinates are set separately by the methods `setX()` and `setY()`. To understand or even change the physics, you have to have some understanding of velocity, acceleration, gravity (as a form of acceleration), and resistance. Also, have in mind that those concepts have to be adopted from a continuous form to a discrete implementation. If you have that understanding, you will be able to understand the code and make adaptions in your favor.

Some easy but fun changes include: - Change of gravitational force: Change the GRAVITY constant in GameElement from 9.81 [m/s^2] to something different. For

less gravitational force, decrease the value. For more gravitational force, increase it. - Change of jumping height: Change the JUMPACCELERATION constant in GameElement from 230 to something different. For lower jumps, decrease the value. For higher jumps, increase it. - Change of character's deceleration ability: Change the RESISTANCE constant in GameElement from 0.2 to something different. For weaker deceleration, decrease the value. For stronger deceleration, increase it. - Change of character's acceleration ability: Change the ACCELERATION constant in GameElement from 5.0 to something different. For weaker acceleration, decrease the value. For stronger acceleration, increase it.

User manual

Welcome to Into the Dark

You're awoken by the echoes of crumbling rocks and dripping water. As your vision adjusts to the dim lighting your eyes trace the outline of a large underground cave with seemingly unexplored caverns scattered into the distance. The path directly in front of you is blocked by large immovable boulders, and while you have no memory of how you've ended up in this place you're well aware you need to leave as soon as possible. Fortunately, your mission won't need to be completed alone, a newfound mineral-based friend has been waiting by your side for you to emerge from your slumber. Pebble, your assistant is here to offer advice on how to navigate this foreign environment. He's seen travellers become lost in this labyrinth before and knows humans can only stay in this area for a limited amount of time before their sanity fully debleats. Pebble is aware of the traps and pitfalls you will encounter while working your way through the cave and will provide guidance as you make your attempt to escape. Pebble has been cast aside by his rock community for being too small and now dedicates his time to help rescue humans from the rock lair as an act of defiance.

Main menu screens:

To start a new game click on the 'New Game' button. You will then be taken to the difficulty selection screen. Your difficulty level will affect the amount of time you have to escape.

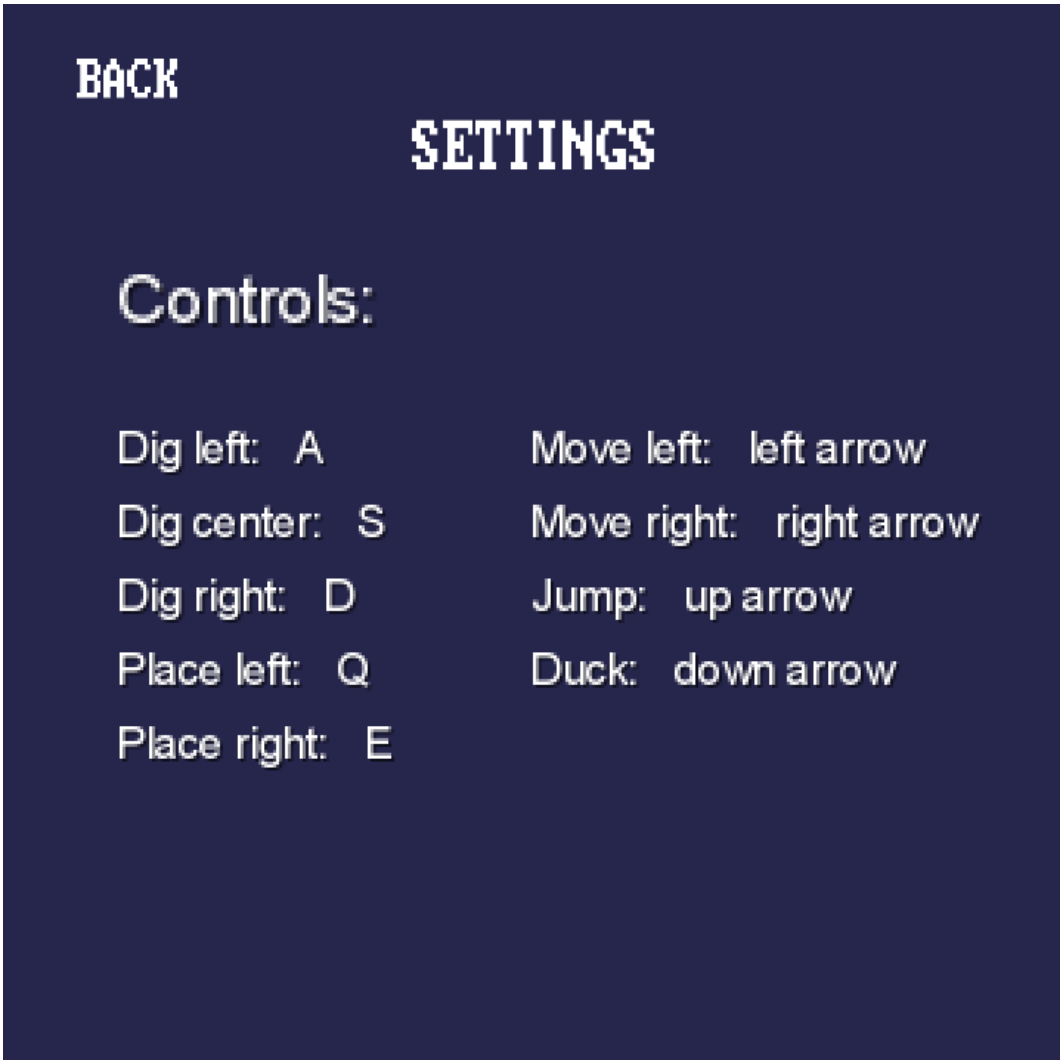
Easy: 1500 seconds

Medium: 750 seconds

Hard: 300 seconds

To load an existing game select the 'Load Game' button. This will reload the game at the point you were at before exiting to the main menu.

To view game controls select the ‘Settings’ button. This will launch a screen with all key bindings listed



To exit the application, select the ‘Exit’ button.

In-game menu screens:

Inventory

Want to improve your health to fight those enemies or place with different blocks? All this can be done in the inventory. Simply click the inventory button in-game. This will take you to inventory menu where you can see the amount of each block you have as well picking which block you want to place. You will also see options to upgrade your armour and when you have enough iron or gold; 30 to be exact.

Remember the more amour you have the longer you can fight enemies

Credits

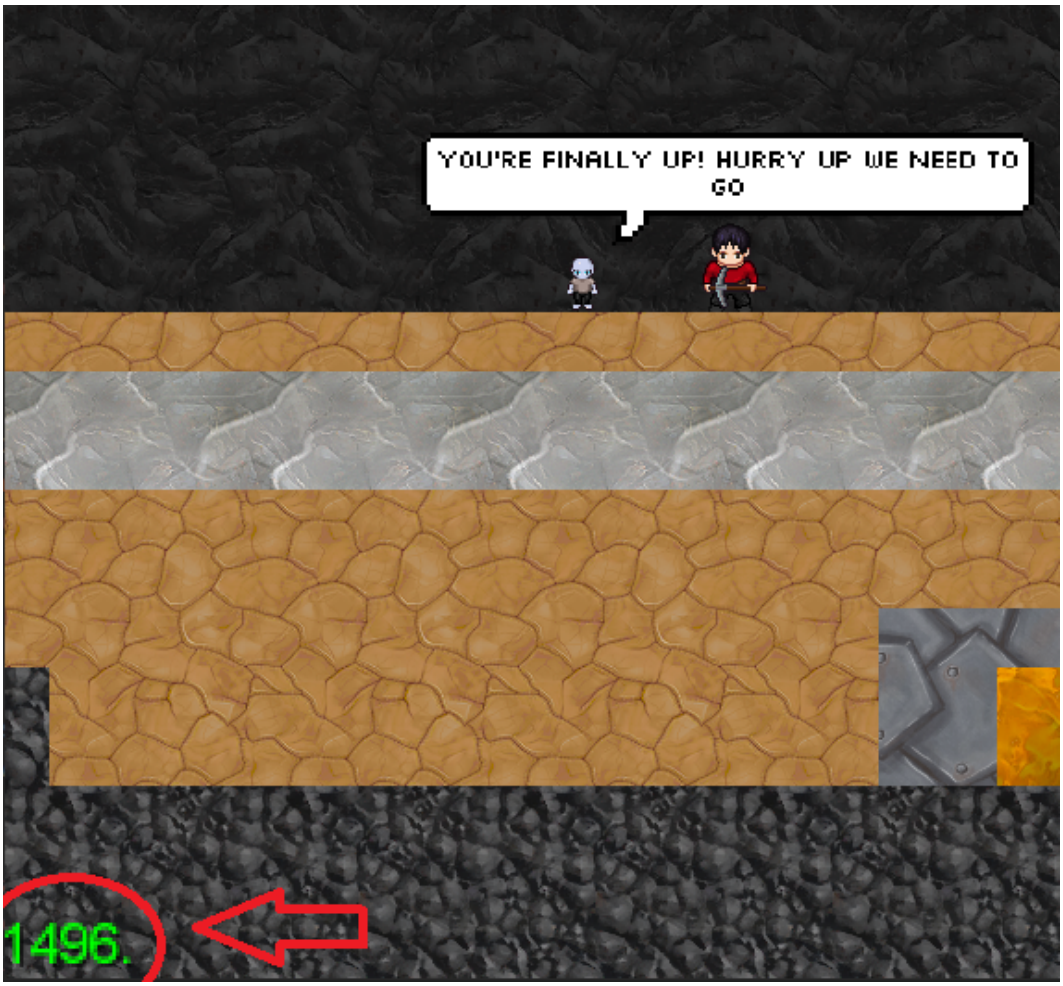
Upon completing the game the credits screen will activate, this will provide information about the creators of the game. After the credits sequence has completed buttons will appear to allow you to either return to the main menu screen or to exit the application.

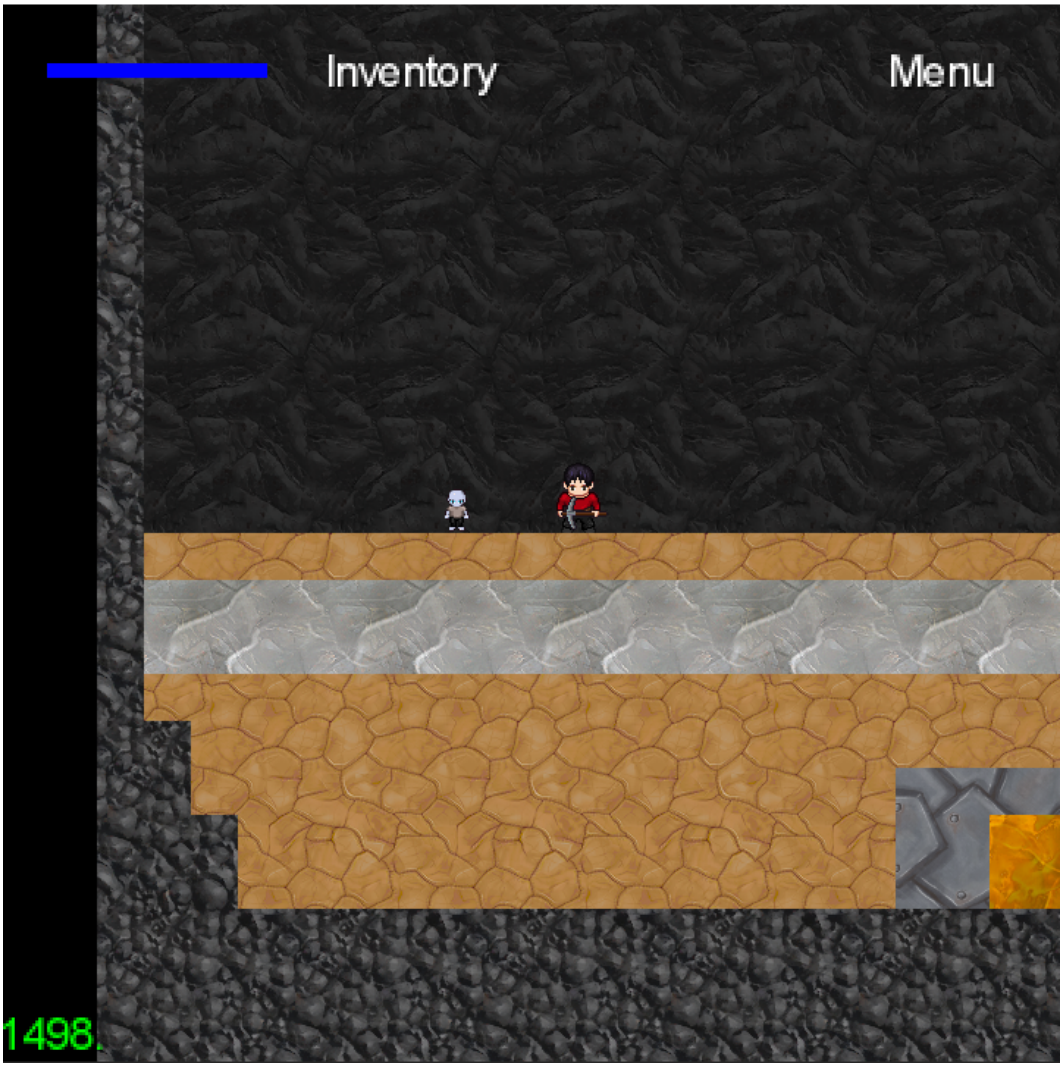
Pebble Speech:

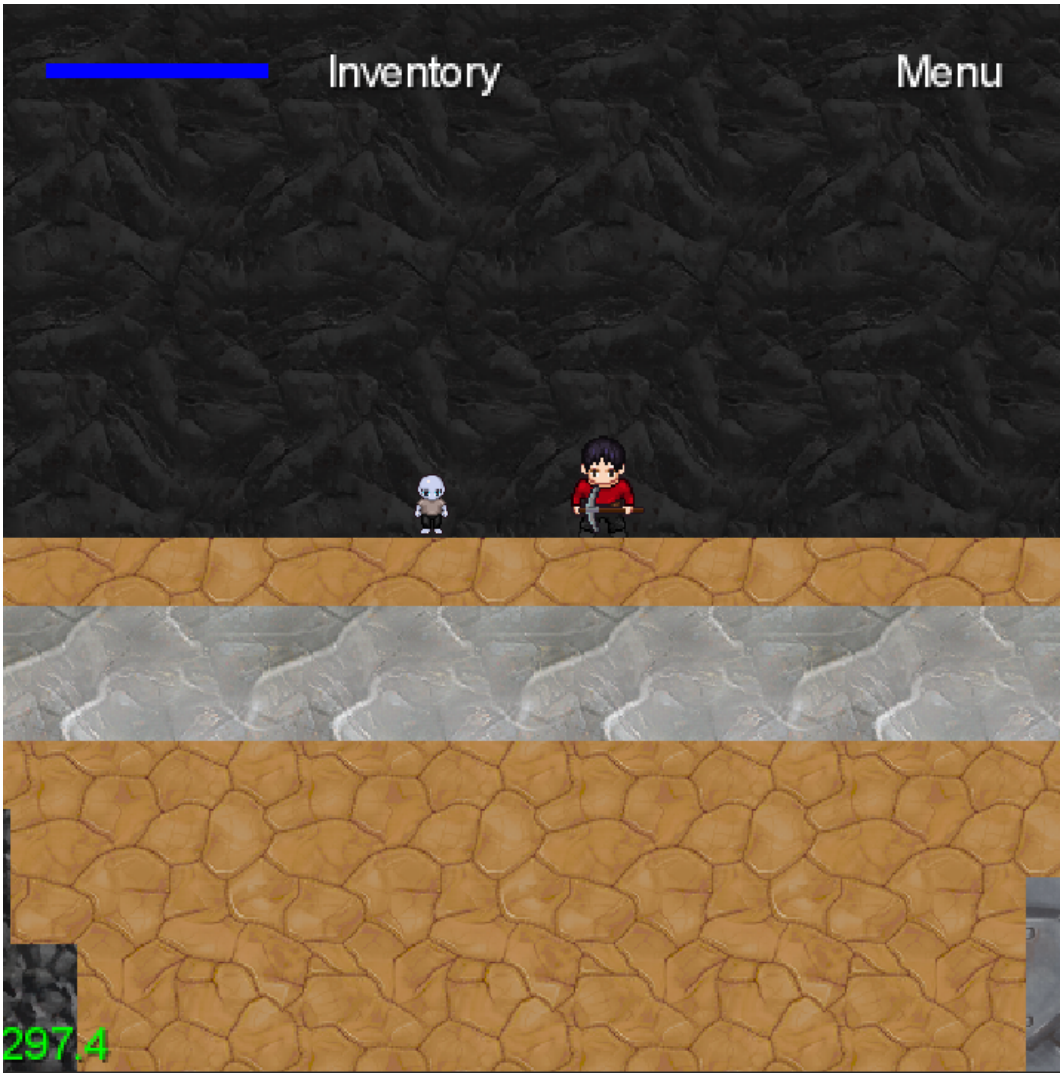
Throughout the game, Pebble can give you advice on how to complete the game. Listen carefully you might learn something new!

Timer:

Be mindful of your remaining time! Once you start a new game the timer will immediately begin counting down. The colour of the timer will fade from green to red as your elapsed time increases. In addition, the zoom on the camera will increase as time elapses and your sanity decreases. This will lower your field of view and make it harder to navigate the terrain.




Inventory
Menu
1498



Movement:

Movement in Into the Dark is performed using the arrow keys, hold the left or right arrow keys to move side to side, press the up arrow key to jump and hold the down arrow key to crouch.

Click here to see walk left

Click here to see walk right

Click here to see crouch

Click here to see jump

Mining:

Mining can be carried out in any direction to mine down press 'S' to mine left press 'A' to mine right press 'D' to mine up press 'W'. The blocks below have the following properties:

- Dirt block - Health 100
- Stone block - Health 200
- Iron block - Health 300
- Gold block - Health 400
- Obsidian block – Health 500

Digging up and down will break three blocks at a time. Digging left and right will break two blocks at a time. Make sure to check the GIF to see the mining.

Click here to see mining left

Click here to see mining right

Click here to see mining up

Click here to see mining down

Placing block:

Throughout the game, you will need to place blocks to reach areas. All you need to do is press 'Q' to place a block to the left or 'E' to place right. From here it up to you to imagine how you can place the blocks together. Remember, you can always change the block by going to the inventory screen. Make sure to check the GIF to see placing.

Click here to see place left

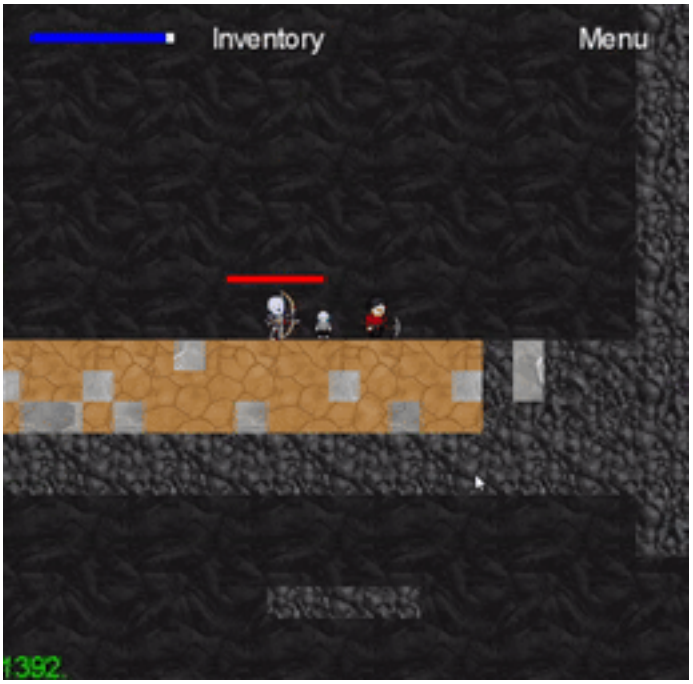
Click here to see place right

Upgrading armour:

Taking a few arrows will hurt so to improve your health you can upgrade your armour. Mine both iron and gold within the game and when you have 30 you will be able to upgrade that specific armour set in the inventory screen. The option to craft the armour will light up when you have enough.

Archers:

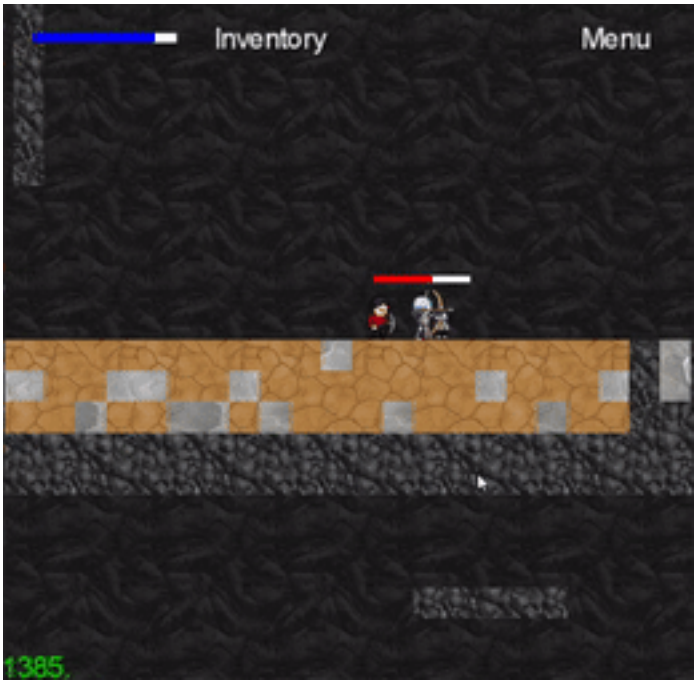
The rock people have archers throughout the dungeon so lookout. These will track and shoot arrows at you and if you are close, they will chase you. So, it is up to you what you do: run away, fight, or build around them. Make sure to look at the GIF to see the full shooting animation.



Click here to see archer shooting

Attack

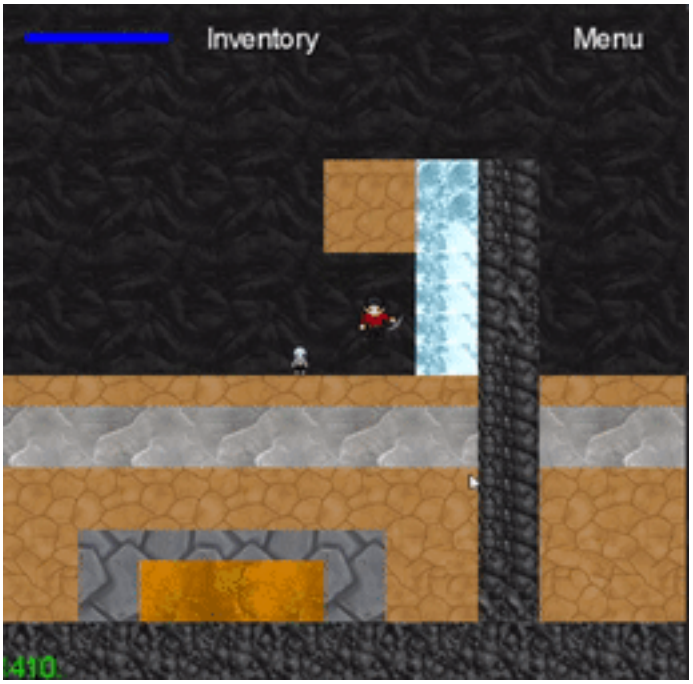
To battle the enemies throughout the map you will attack them with your pickaxe, which is done by holding down the spacebar. Make sure you are close enough to hit them and you will see their health go down until they die.



Click here to see the attack animation

Anti-gravity block:

You will notice a light grey coloured block in various place within the map. These are anti-gravity blocks and when you walk over them the gravity reverses, shooting you up the map. Once you exit the block the gravity returns to normal. Make sure you do not lose pebble flying about!



Click here to see anti-gravity animation

Boss:

Located in the dungeon there will be room where the king of all the rock people resides. Here you will fight him to win the game. He will follow you and swing his battle hammer to kill you, so be creative with how you fight. Once you have killed the king the game is complete.

Death:

If you are unlucky enough to lose all your health to arrows or the battle hammer, you will die, and the game run will end. The credits will pop up and at the end you will have an option to go back to the main menu so you can play again or close the program. We know which choice is better. Check the GIF to see the death animation.

Click here to see the death animation