

# Lavateer

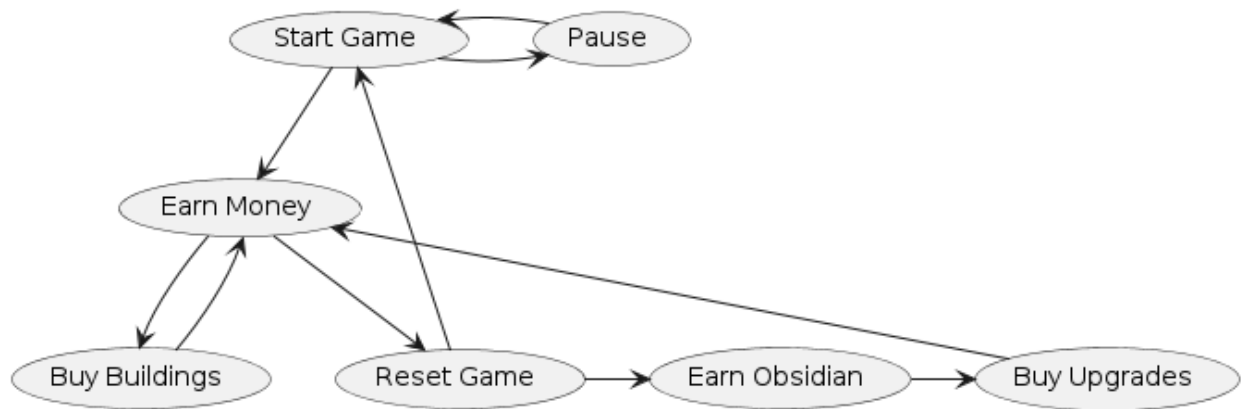
An idle game designed by Aria Seiler, Ben Graham, and Aidan Frantz

# Table of Contents

<b>Table of Contents</b>	<b>2</b>
<b>Diagrams</b>	<b>3</b>
Gameplay Loop Diagram	3
<b>Key Features</b>	<b>4</b>
Start Game	4
Pause	5
Earn Money	5
Buy Buildings	6
Buy Upgrades	6
Earn Obsidian	6
Reset Game	7
<b>Software Design Patterns</b>	<b>7</b>
EventBus	7
State Management	7
Decorator Pattern	7
Extensible Upgrade and Building System	8
<b>Sources</b>	<b>8</b>

# Diagrams

## Gameplay Loop Diagram



[www.plantuml.com/plantuml/png/SoWkIImgAStDuT881h4Kt1DpKpKLT5Foo\\_DqxHGqN1EByXHy\\_DIApMva3a85KwbbGfEfPavAPbvwSMQN6Xy1U8C2KejJeNQpON40QeeBG3AGzs6AOymtZ-fE3CbCp4FA8\\_ALu0vChGWIIWn9HNYHWGNquaEgNafm1010000](http://www.plantuml.com/plantuml/png/SoWkIImgAStDuT881h4Kt1DpKpKLT5Foo_DqxHGqN1EByXHy_DIApMva3a85KwbbGfEfPavAPbvwSMQN6Xy1U8C2KejJeNQpON40QeeBG3AGzs6AOymtZ-fE3CbCp4FA8_ALu0vChGWIIWn9HNYHWGNquaEgNafm1010000)

# Key Features

## Start Game



When you first start the game, the countdown timer immediately starts. It's an immediate frenzy, you start clicking the buildings, getting upgrades, and reading tooltips to prepare for the first loop of the game.

## Pause

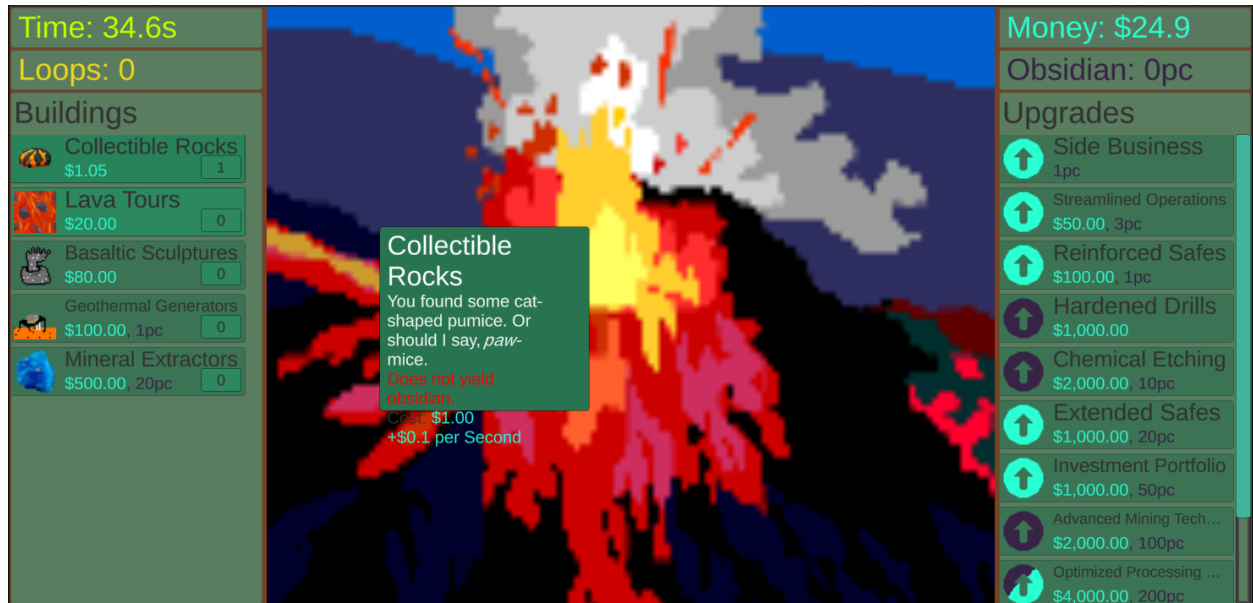


When you press Esc on the keyboard, the game will pause. This can give you a moment to catch your breath and read the tooltips for all of the buildings and upgrades, which is invaluable to planning your future runs.

## Earn Money

Each building in the game generates money, and upgrades oftentimes apply modifiers that allow you to generate even more money, which in turn allows you to buy more buildings. Money is destroyed every run, so the goal is to earn as much of it during a run as possible.

## Buy Buildings



Buildings generate money, which is the cornerstone of the game. Buildings are also the key to obtaining obsidian. Thus, the more buildings you have, the more of both in-game currencies that you'll earn.

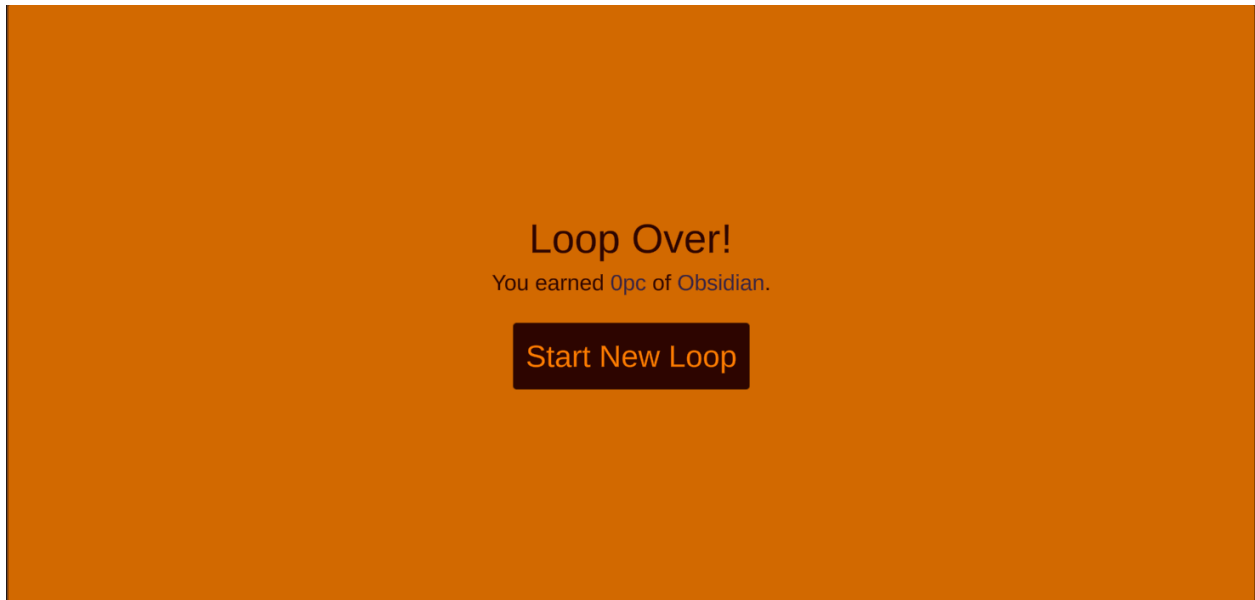
## Buy Upgrades

Upgrades are like buildings but can apply broader multipliers and only cost obsidian to buy. They won't earn you obsidian at the end of a round so you need to be selective in which upgrades you choose.

## Earn Obsidian

For every building you own (excluding Collectible Rocks), at the end of the loop the buildings are destroyed and you earn obsidian. Obsidian lets you buy special buildings and upgrades, which allows you to get bigger every loop.

## Reset Game



At the end of each loop, the game will reset and show you how much obsidian that you earned. Then, you start the game off with your new obsidian, ready to buy new upgrades and get even farther in your next run!

## Software Design Patterns

### EventBus

Using the EventBus model, UI events and Game events can be instantly reacted to by the system. This has allowed for dynamic audio and gameplay changes.

### State Management

The game contains state management info that tells it when to display the Game Over screen, the Loop Over screen, and which Upgrades/Buildings have been purchased in a given run.

### Decorator Pattern

The game modifier is a decorator, meaning it can be easily extended to add on new modifiers and upgrades. This makes it easy to add new game features and expand the idle game.

# Extensible Upgrade and Building System

By adding entries to a list with additional UpgradeInfo and BuildingInfo objects, new upgrades and buildings can be easily added to the game. They will even load the corresponding Building or Upgrade texture, making this game even more easy to extend.

## Sources

- Collectible Rock Texture: <https://opengameart.org/content/lava-rock> (by Jordan Irwin (AntumDeluge))
- Lava Tour Texture: <https://opengameart.org/content/lava-stones> (by Althaj)
- Basalt Statues Texture: (By Aidan Frantz)
- Geothermal Generator Texture: (By Aidan Frantz)
- Mineral Extraction Texture: <https://opengameart.org/content/cc0-mineral-icons> (by AntumDeluge)
- Up Arrow: [https://commons.wikimedia.org/wiki/File:Eo\\_circle\\_red\\_arrow-up.svg](https://commons.wikimedia.org/wiki/File:Eo_circle_red_arrow-up.svg) (with color modification by Aidan Frantz)
- Money Symbol: <https://www.wannapik.com/vectors/2734> (by Wannapik Studio)
- Glass Floor Texture: <https://opengameart.org/content/obsidian> (by Fupi)
- Volcano Background: <https://opengameart.org/content/volcano-pack> (by samOki)
- Mouse Button Click: <https://www.zapsplat.com/music/bright-button-click-3/> (by ZapSplat)
- End Loop Sound Effect (Volcano Eruption):  
<https://tuna.voicemod.net/sound/7c0bdb8a-0bc3-4dcc-8d93-2fc47853184a> (by elearuchangeling)
- End Game Sound Effect (Trumpets):  
<https://pixabay.com/sound-effects/success-fanfare-trumpets-6185/>