



MesoMerchant

Ancient Mesopotamia Trading Game





Team 4 SE Development

Software Team on MesoMerchant

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Overview

Problem

- Goal was to create a game that could teach 6th Graders about Ancient Mesopotamia.
- The game would take place in Ancient Mesopotamia, a geographic region in Modern Day Iraq around 2000 B.C.
- The game would teach about this period through:
 1. NPC Dialogue
 2. Object Interaction
 3. Assets and Setting

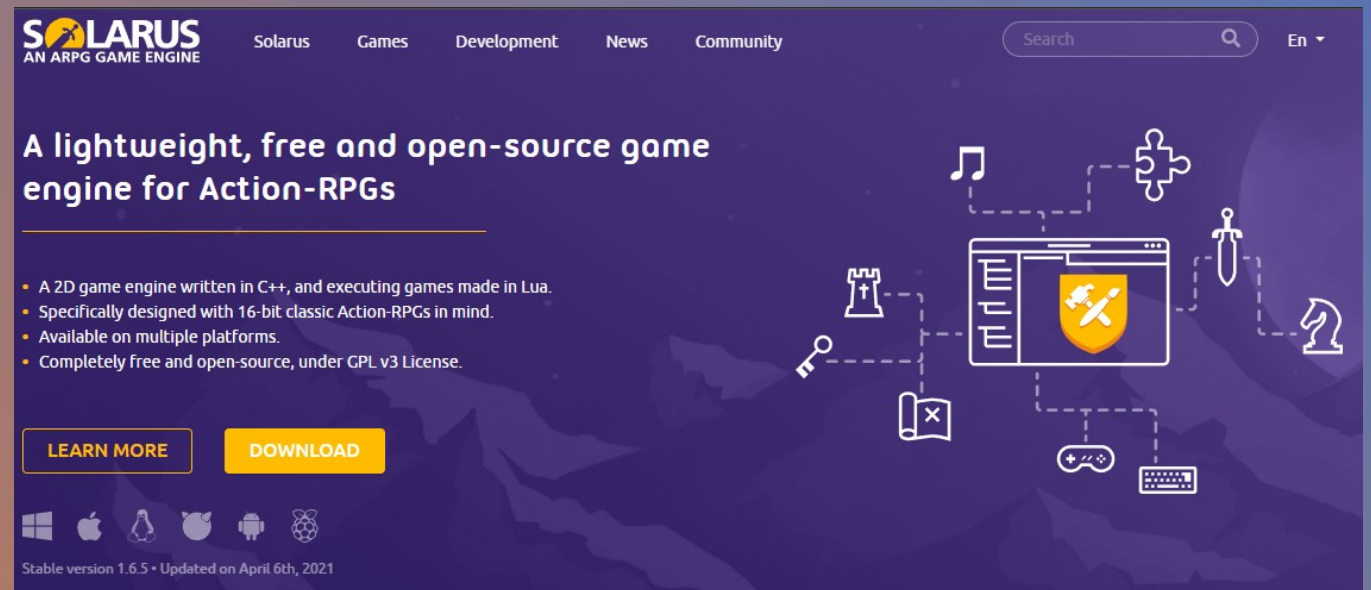




Solarus Game Engine

Technology

- Engine was needed to handle rendering and other common game functions
- Three Engines were investigated:
 1. Solarus Engine
 2. Unity Engine
 3. Gamemaker Studio Engine
- Solarus was chosen
 - Pros
 - Language of Solarus Engine was LUA, which is a language comparable to Python and not exceedingly difficult to learn
 - Solarus implemented organizational features like Map and Sprite management very well
 - Cons
 - The engine does not have large usage, which reduces the availability of support on the topic



Chistopho Games, <https://www.solarus-games.org/en>

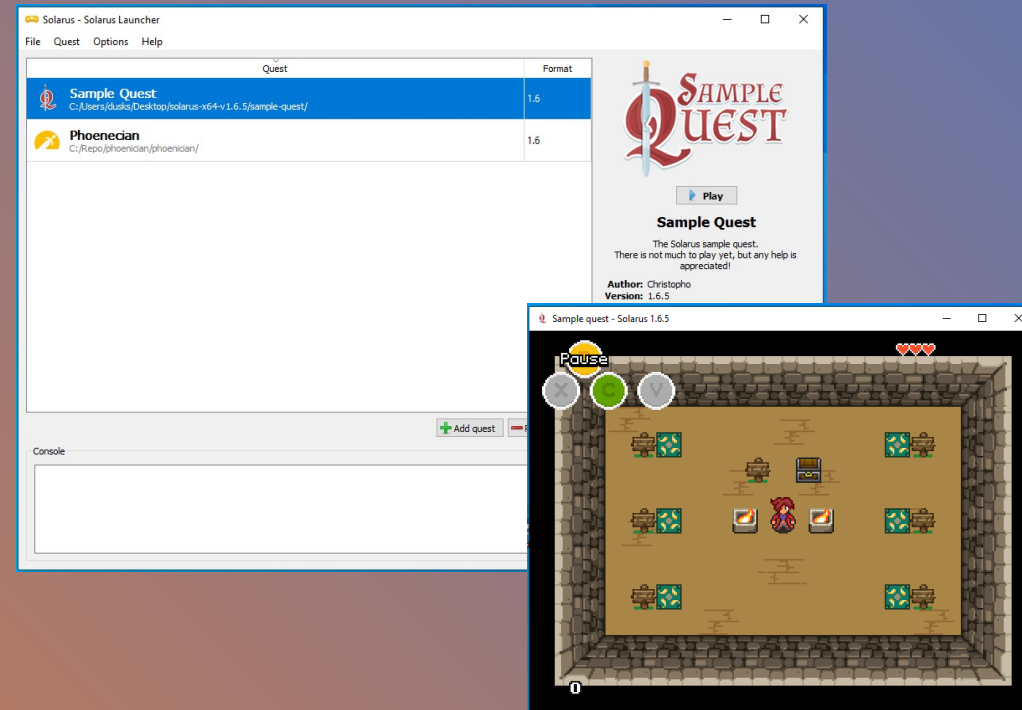




Solarus Game Engine

Technology

- Solarus is a game engine and editor that uses ROM-like files to create games called “Quests”
- It is meant to build and play 16-bit Classic ARPGs



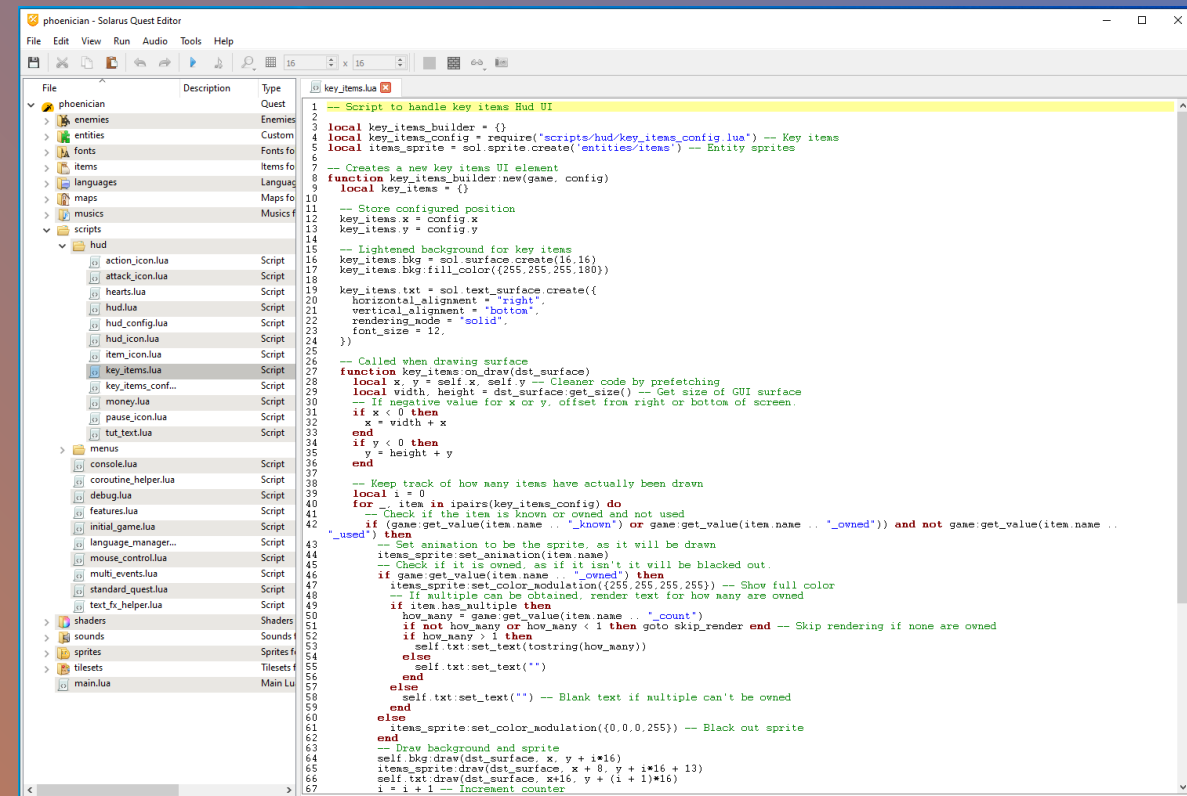
Chistoph Games, <https://www.solarus-games.org/en>



Solarus Game Engine

Methodology

- The game would teach about Ancient Mesopotamia through:
 1. NPC Dialogue
 2. Object Interaction
 3. Assets and Setting
- Solarus Editor would allow us build, collaborate, and implement game mechanics.
- Other supporting resources like Azure DevOps (Repository), Discord, and Google Drive would be use to centralize resources and manage documents.
- Agile Methology was used to create consistent “full game” deliverables.



Solarus Engine Editor, Custom UI Scripting in LUA



Solarus Game Engine

Methodology

- Core mechanic of MesoMerchant is trading items in order to progress to next level.
- Item inventory on top-right keeps track of the items you have and are looking for.
- Reinforced Learning helps players learn about Ancient Mesopotamia through:
 - NPC Dialogue
 - Teaches staple crop is Barley
 - Object Interaction
 - Feeding Sheep and Trading teaches about how excess crops were used
 - Asset and Setting
 - Items and Town Re-Inforce Mesopotamia Geography, Barley, and Sheep as Livestock information



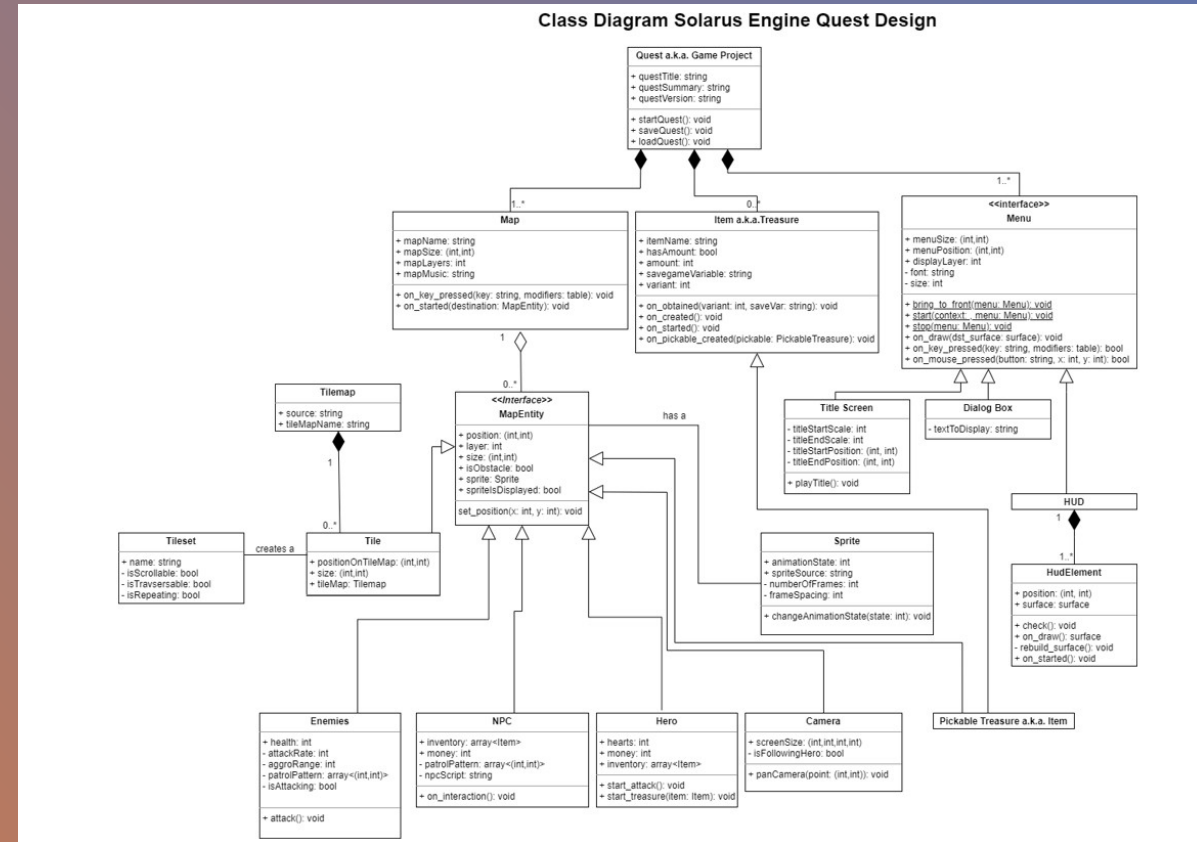
Learning Outcomes Example, In-Game Capture from MesoMerchant



Solarus Game Engine

Architecture

- Solarus based around “Quests” which is equivalent to the full game
- LUA programming and scripts are driven by Map and Interaction events
- Necessary to build scripts to accomplish UI design and trading functionality
- Necessary to design Maps that contain necessary assets to teach learning outcome

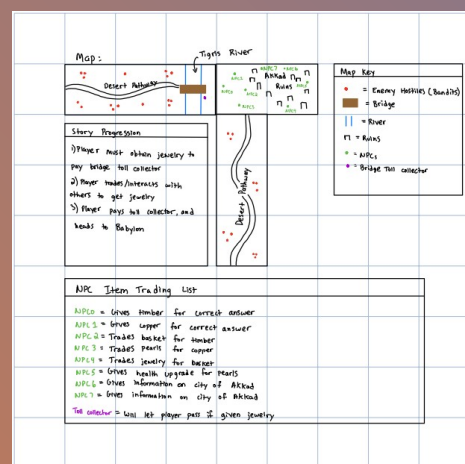
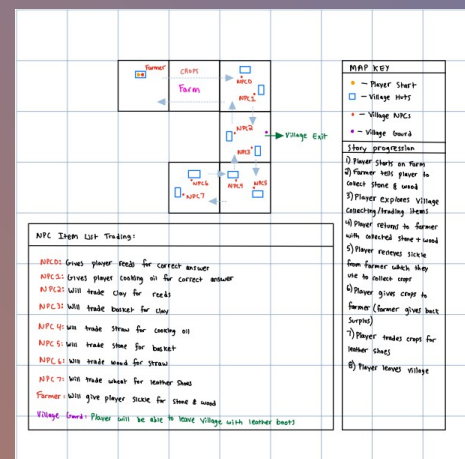


Solarus Engine Class Diagram Structure

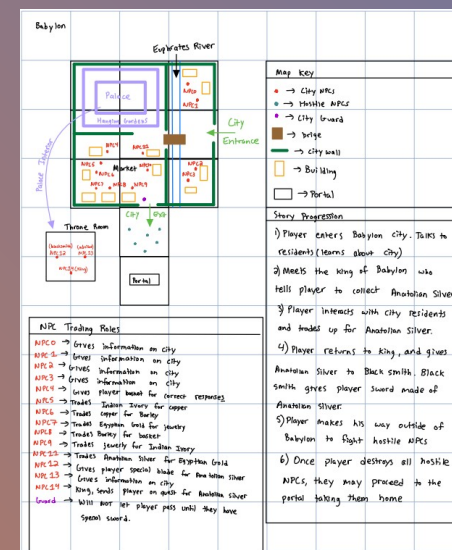
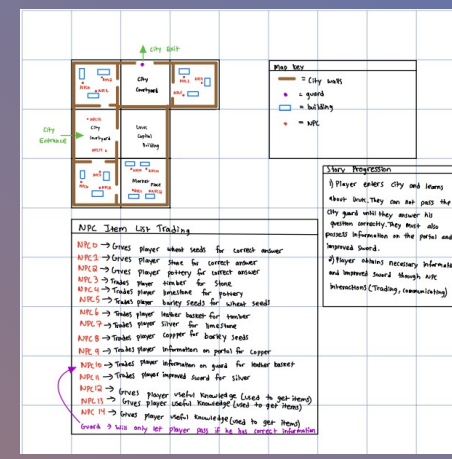
Level Design and NPC Scripts

Level Wireframes

- Map Wireframes Detailed:
 - NPC Locations
 - Map Locations and Tile Placement
 - Trading Order
 - Key Trading Items
- Ri Village, Euphrates River, and Babylon Implemented



Map Wireframes





Level Design and NPC Scripts

Dialogue and NPC Scripts

- Dialogue and NPC Scripts were critical in explaining how the story progressed
- Historically relevant Dialogue was created to teach:
 - Irrigation, Farming, and Trading and it's importance in Mesopotamia
 - Hammurabi's Code and the Legal Precedent in Babylon
 - Epic of Gilgamesh
- 40+ Lines of Created for Dialogue for 18 NPCs, and 10 Unique Items, 7 Unique Game Mechanics, all with Historical Accuracy and to Ancient Mesopotamia
- Sample Dialogue:
 - Thank you for the cedar wood. Gilgamesh and his close friend, Enkidu, once journeyed through a cedar forest. Eventually, they returned home on a raft made of the very wood that makes up the forest. (Storytelling from the Epic of Gilgamesh)

-Merchant 3 (Babylon 2_2)
-Merchant 4 (Babylon 2_3)
-Merchant 5 (Babylon 2_3)
-Merchant 6 (Babylon 2_3)

-10 Hostile NPCs:
-Hostile 1 (Babylon Outside_1_2)
-Hostile 2 (Babylon Outside_1_2)
-Hostile 3 (Babylon Outside_1_2)
-Hostile 4 (Babylon Outside_1_2)
-Hostile 5 (Babylon Outside_1_2)
-Hostile 6 (Babylon Outside_1_2)
-Hostile 7 (Babylon Outside_1_2)
-Hostile 8 (Babylon Outside_1_2)
-Hostile 9 (Babylon Outside_1_2)
-Hostile 10 (Babylon Outside_1_2)

Dialogue depends on NPC + items carried/item

Stage 1 (Collect Missing Information)
Local Historian: "Welcome to the city of Babylon. I am close to finishing my novel on King Gilgamesh. I need information to make it complete. If you come and help me, I will shall give you a reward for your efforts!"

If in possession of 3 stone tablets, "Wow, you are a great creation of my novel. I'm thinking of calling it the Epic of Gilgamesh. Anyway, here is something I picked up for you. It's a silver piece. [Used to pay guards]
+Gives Anatolian Silver piece [Used to pay guards]
-Removes Stone Tablet

Local 1: "I will give you information on Gilgamesh's journey to trade]"

If in possession of a garment, "Thank you for the cedar wood. Gilgamesh and his close friend, Enkidu, once journeyed through a cedar forest. Eventually, they returned home on a raft made of the very wood that makes up the forest. (Storytelling from the Epic of Gilgamesh)"
+Gives Stone Tablet
-Removes garment

Mesopotamia Research Notes



Mesopotamia Trading (Sources:
<https://www.historyonthenet.com/mesopotamian-merchants-2>)

- Southern Mesopotamia was well-irrigated which allowed for the growth of fruits and vegetables, nuts, dairy, fish, and meat
- Region was also rich in mud, clay, and reeds (used for building)
- Mesopotamia relied on trade for other essential goods
- Trade Development
 - Transportation of goods became easier with the use of oxen and sail
 - Heavy bulk goods could travel via ox carts
 - Long-distance travel carried out by caravans (Donkeys can carry roughly 150 lbs of goods)
 - Craftsmen created variety of trade goods
 - fine textiles
 - sturdy/nearly mass-produced pottery
 - leather goods
- Jewelry
- Basketry

Level 1 - Ri Village:
-Teaching Outcome
-Irrigation, Staple Crops, Trading

-Teaching:
-Object Interaction
-NPC Dialogue
-Assets/Setting

-4 main NPCs:
-tutorial person (village_1_1_inside, 192, 104)
-barley farmer (TBD)
-merchant (TBD)
-livestock farmer (TBD)
-guard (TBD)

Dialogue depends on NPC + items carried/item state.
Could use invisible items?

Stage 1 (tutorial talk):
*(Substage) - Has not talked to Tutorial Person. Player can't leave house.
(NPC) Tutorial Person: "This is Ancient Mesopotamia. You are a laborer in the town of Ri Village. Your goal is to discover and collect items to leave the village. Items you are looking for or own will show up in the top right hand corner."
*(Substage) - Has talked to Tutorial Person: After completing talk with Tutorial Person the player will be able to leave the house.

Stage 2 (fix irrigation then reap barley):
*(Substage) - Has not gotten barley: Player can't leave farm.
(Stage Description) Farm has a river that is diverted with irrigation over a few tiles. The irrigation is 5 tiles long, but the water flow is blocked in the middle and does not reach the empty crop area.
(NPC) Barley Farmer - State: No Items: "We divert water from the Tigris River to grow our barley crops. Nothings seems to be growing now, something must be wrong. Can you take a look around and see if you can fix it?"

*(Object) Working Irrigation: "Water seems to be flowing from the river into this irrigation."
*(Object) Broken Irrigation: "Something seems to be blocking the irrigation." or "The irrigation here needs to be repaired."

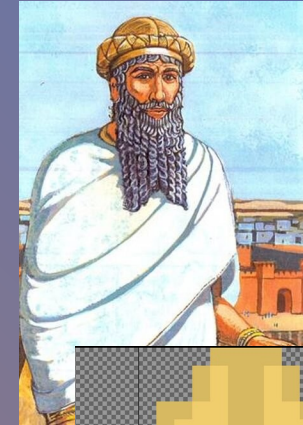
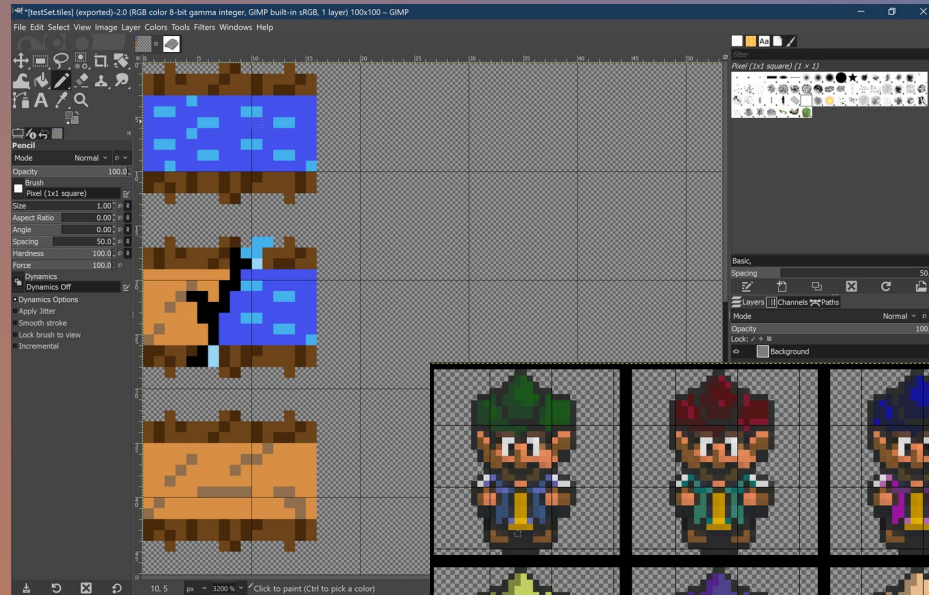
Map Scripts and Dialogue



Asset Creation

Asset Creation

- Assets were critical to storytelling
- In some cases, assets were available in asset packs that came with the game
- In other cases, assets and animations had to be built by hand



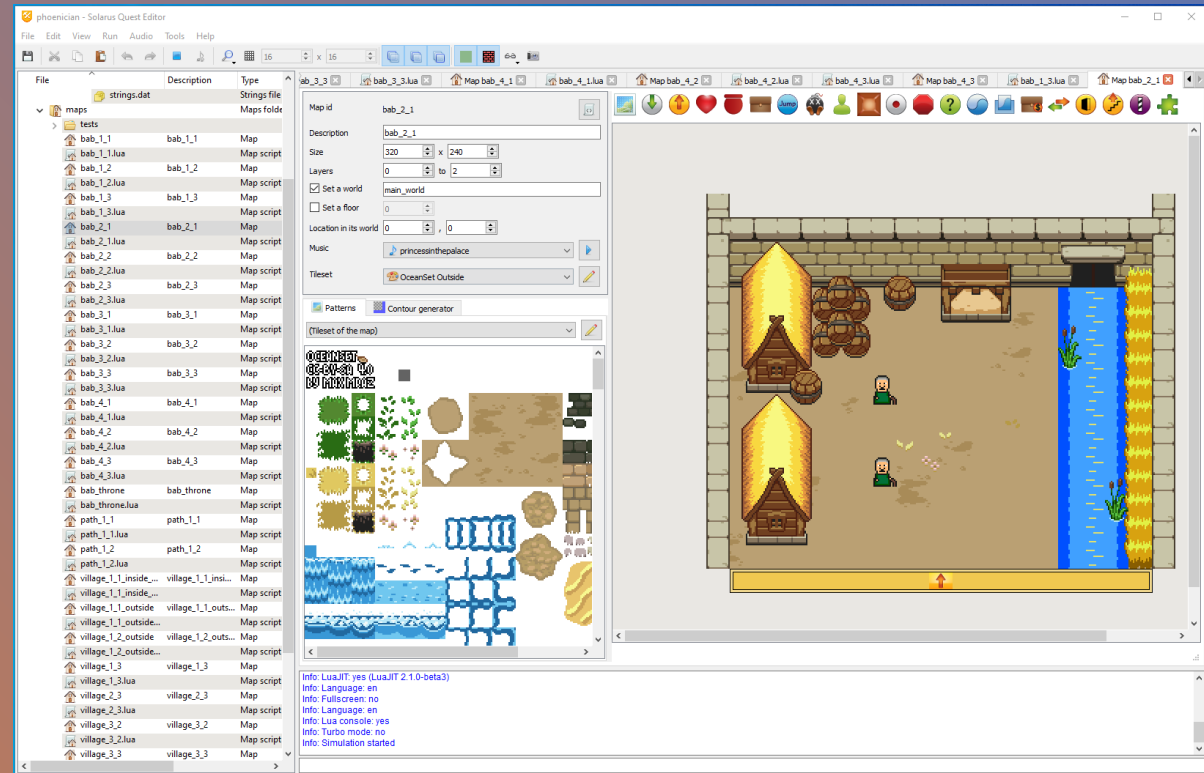
Left: Asset Creation, Right: King Hammurabi and Created Model,
(image <https://www.thetakegallery.com/home/hammurabis-solution-to-student-debt>)



Asset Creation

Map Implementation

- Maps were one of the most central parts of the project
- LUA Scripting elements, storytelling elements, teaching elements, assets, and game interaction all came together on Map Tiles
- 22 Map Tiles Built and Implemented

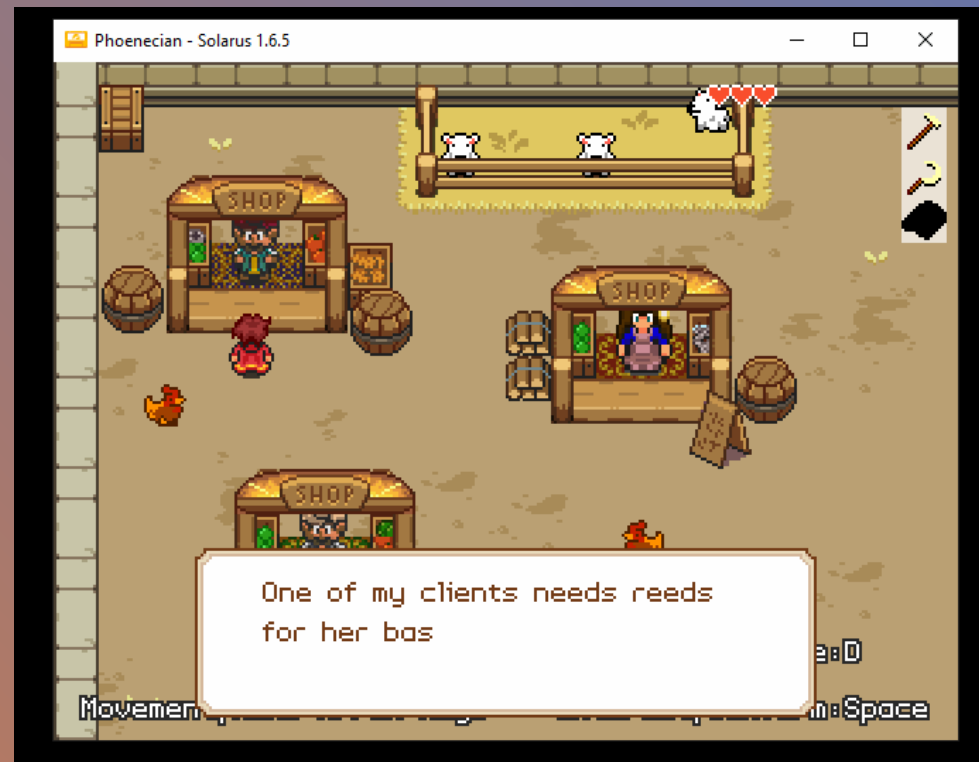


Map Editor

Engine Implementation

Core Features

- Core feature involves a Ask, Find, Complete Mechanic
 - Ask
 - NPC asks for historically relevant item
 - Find
 - Player finds item through trading, NPC interaction, or other game interaction
 - Complete
 - Player finds item, trades it, and is given a reward
- Programmed UI + Standard_Quest System
 - Using LUA scripting, dialog and items are added to Standard_Quest system
 - This allows for modular addition of NPC Trades and UI Item Tracking

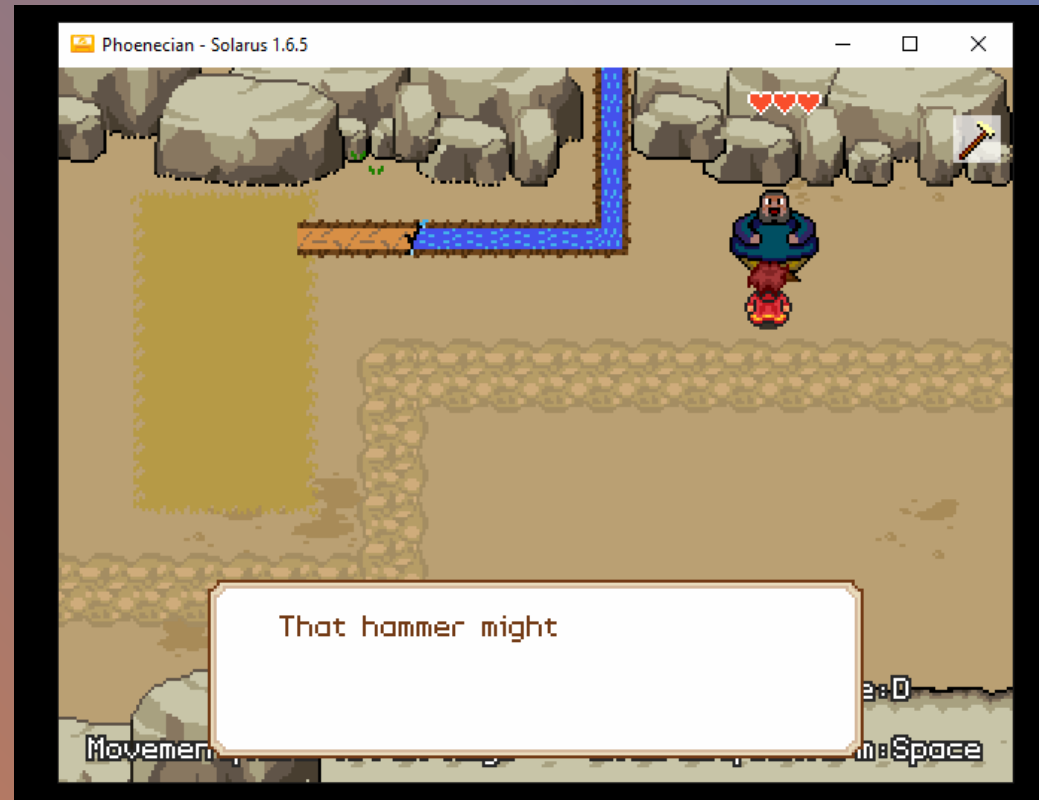


Trade and Find Mechanic

Engine Implementation

Lua Implementations

- Additional LUA was used to script:
 - Mining, Cutting Trees, Farming Barley, Reaping Barley
 - Animations to Items
 - Enemy NPC Movement
 - Object Interactions
 - Dialogue
 - Item UI
 - Barrier Implementation
- MesoMerchant consists of 7+ Major Features and consists of 60+ Minor Implementations, in addition to the base engine implementations



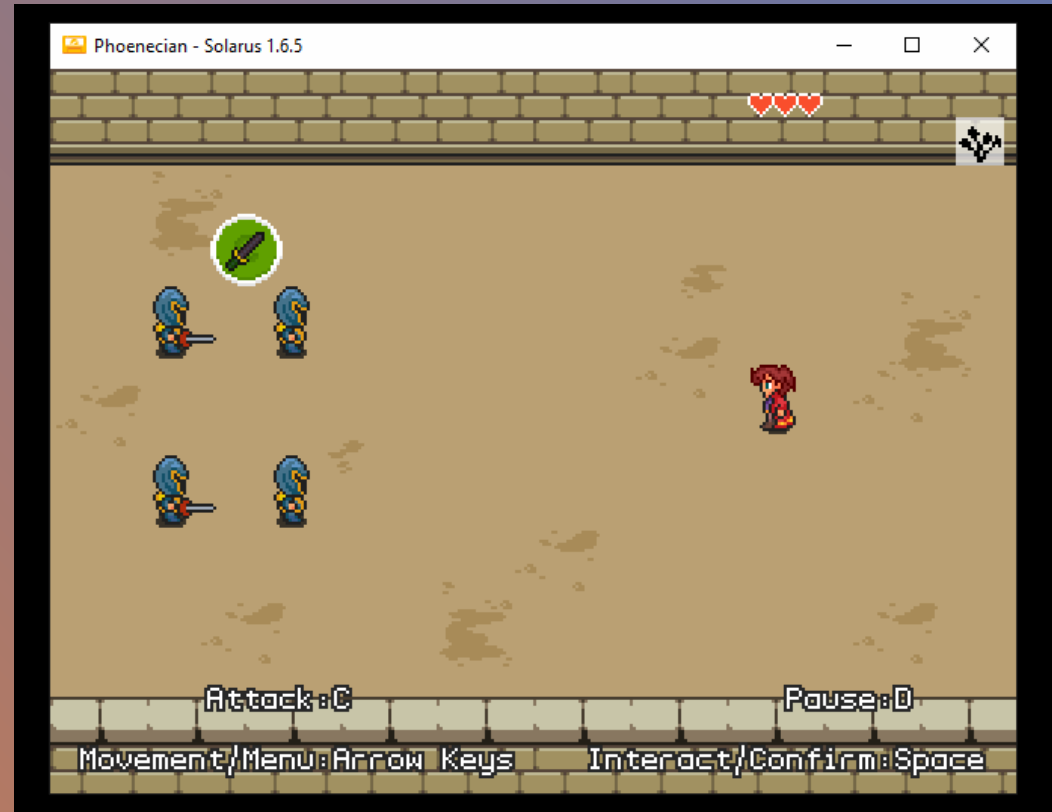
Custom Interactions, Animations, and Game Logic using LUA



Finished Game

Accomplished

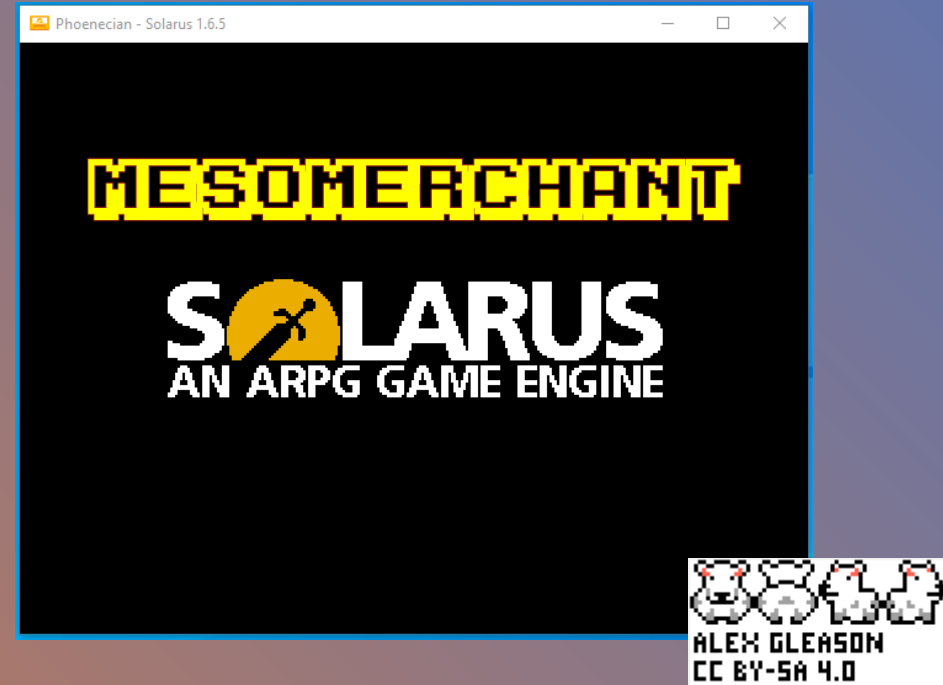
- Two fully playable Maps: Ri Village and Babylon
- 7 Song Unique Soundtrack
- Journey to Babylon:
 - You look like a merchant trader! The path to Babylon is outside this door. It's a great big city, the largest you've ever seen! **Take some of the trade goods you've earned and trade them there, in Babylon!**
- Feed sheep, learn to farm, fight bandits, trade items, and meet King Hammurabi!
- Core trading mechanics, dialogue, and settings implemented.





Future Work

- City of Uruk
 - Add in the Uruk, another famous Mesopotamian City.
 - Add in and Meet King Gilgamesh!
 - Add more items and traders.
 - Possible Items to Add:
 - Devotional Figurines
 - Persian Tin
 - Make sheep follow you around.





References

1. Hammurabi's Solution to Student Debt

Stanger

<https://www.thetakegallery.com/home/hammurabis-solution-to-student-debt>

2. Ancient Mesopotamia for KidsGeographyThe Land Between Two Rivers

<https://mesopotamia.mrdonn.org/geography.html>

