P02: Makers Makin' It, Act I
Team Name: DeadDuckies
Roster: James Lei (PM), Kiran Soemardjo (Dev 1), Emaan Asif (Dev 2), Sarah Zou (Dev 3)
TARGET SHIP DATE: 2026-01-16

Description

We made a dumbed-down version of Civilization 6 with its city-building and tile-based expansion systems combined with a simplified research and technology progression system inspired by Hearts of Iron IV. Games will occur between two players in a lobby with a pregenerated map and spawn points opposite each other. Players take turns buying tiles, developing research and technology, constructing resource improvements and districts, pillaging each other's tiles while managing resources.

Tiles / Improvements: The map will consist of hexagonal tiles, which have different terrain types. These terrain types determine the yield of a tile, which consists of the core resources: science, gold, food, and production. Tiles may have bonus resources (e.g. wheat, sheep, diamonds) and strategic resources which provide additional yield and are accumulated each turn once the tile is improved. Improvements cost production, but, when built, they increase the yield of the tile.

Population / Workers: Tiles only generate resources for a player if they are worked. The number of tiles that can be worked is determined by the population of the civilization. Population grows each turn based on food production.

Districts: Districts can be built over a tile, replacing the preexisting yields. Commercial hubs generate gold, campuses generate science, and industrial zones generate production. City centers generate gold production, and science. Encampments will be covered later. Districts can have multiple improvements on them called buildings. They do not need to be worked. Districts also have adjacency bonuses based on the districts and improvements surrounding them.

Research / Technology: Technologies can be researched to unlock or improve units, districts, and buildings. Each technology has a fixed cost in science.

Expansion / War: Players can purchase new tiles adjacent to their current ones using gold. Units can travel into enemy territory. They can pillage enemy improvements, which removes the improvement and generates yield for the pillaging player.

Things Cut from Base-Game Civilization 6: Amenities, Religion, Culture, Settlers, Great People, Government, Naval Warfare, Post-Industrial Age Content, Natural Wonders, Turn/City-Based Production, City Health, Unit Attacking System, Maintenance

Dependencies

Framework: None
JavaScript: SocketIO (https://cdn.socket.io/4.8.1/socket.io.min.js)
Python: Flask, Sqlite3, Flask-SocketIO
APIs: None

Tasks + Assignments

Project Manager: James Lei
  - Set up SocketIO and server updates in Flask and JavaScript
  - Implement Lobby, Districts & Buildings, Start/End Game & Turn Functionalities, Encampments
  - Debugging and helping with everyone else's tasks

Dev1: Kiran Soemardjo
  - Create database structure
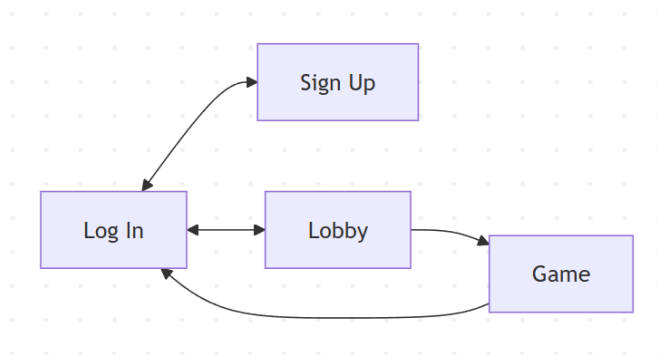 - Implement Research and Technology components

Dev2: Emaan Asif
  - Implement Authentication and Unit components

Dev3: Sarah Zou
  - Set up JSON and external resources
  - Implement UI, Map and Tile Expansion & Construction components, Pillaging

Site Map

Log In / Sign Up	- Users create accounts and log in
Lobby	- Users create a game or join other users' game
Game	- Displays the game - Can only exist in lobby

External Resources

Civilization 6 Wiki - Resource Icons & General Game Information
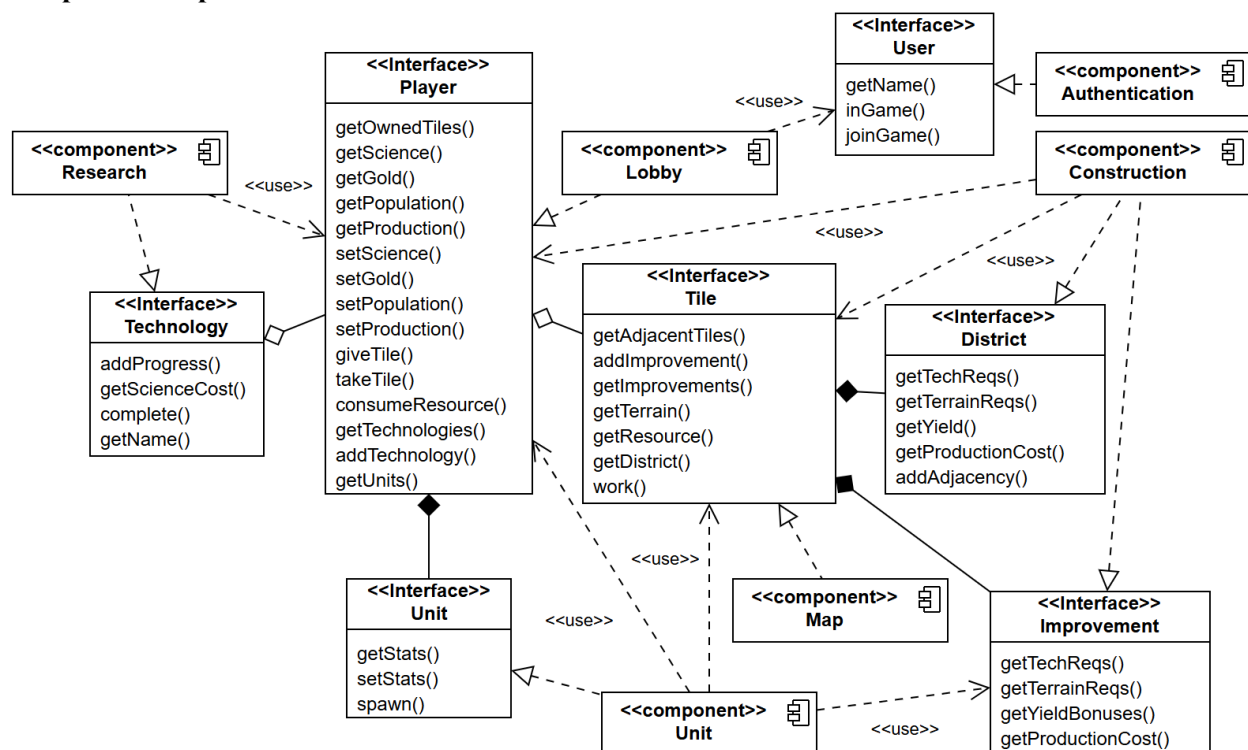(https://civilization.fandom.com/wiki/Civilization_VI)

UnTile - Tileset
(https://github.com/Malwen/UnTile-Civ6-Tileset)

Components

Authentication
- Create user accounts and logs them in
- Implements User interface

Lobby
- Displays available games and let users create/join games
- Uses User interface to associate each game with two users
- Instantiates Player interface on game load

Map
- Renders the map and the game's UI (i.e. tile, tech, unit info. resources in storage)
- Implements the Tile interface

Construction
- Builds new improvements and districts in an empire
- Uses Tile interface to check if an improvement can be built
- Uses Player interface to consume resources needed for construction
- Implements District and Improvement interfaces

Unit
- Spawns units and moves them around the map
- Handles population growth and adds workers to tiles
- Uses Improvement and Player interfaces to pillage tiles
- Uses Tile interface to determine movement cost and travel
- Uses Player interface to use resources / check technologies needed to produce units

Research
- Displays the technology tree and researches new technologies
- Implements Research Slot and Technology interfaces
- Uses the Player interface to associate research with a player and consume science

Component Map

Database Organization

Profiles		
TEXT	username	PK
TEXT	password	

Games		
INTEGER	id	PK AUTOINCREMENT
TEXT	player1	FK REF profiles(username)
TEXT	player2	FK REF profiles(username)
TEXT	winner	
INTEGER	turn	DEFAULT 1
BOOLEAN	player1Turn	DEFAULT TRUE

Resources		
INTEGER	game	FK REF games(id)
TEXT	player	FK REF profiles(username)
TEXT	name	
INTEGER	amount_stored	INTEGER DEFAULT 0

Tiles		
INTEGER	game	FK REF games(id)
TEXT	owner	FK REF profiles(username)
TEXT	terrain_type	
INTEGER	x_pos	
INTEGER	y_pos	
TEXT	resource	
TEXT	improvement	

Technologies		
INTEGER	game	FK REF games(id)
TEXT	player	FK REF profiles(username)
TEXT	name	

Districts		
INTEGER	game	FK REF games(id)
INTEGER	id	PK AUTOINCREMENT
TEXT	name	
INTEGER	x_pos	
INTEGER	y_pos	

Buildings		
INTEGER	district	FK REF districts(id)
TEXT	name	

Units		
INTEGER	game	FK REF games(id)
TEXT	owner	FK REF profiles(username)
INTEGER	x_pos	
INTEGER	y_pos	
TEXT	name	
INTEGER	health	