Project Breakdown by Milestones (Modules):

Module 1:

- **3D Game App: UI/ UX Framework & Game Design**

Module 2:

- **3D Game App: Landing Page**
- **3D Game App: User Authentication**
- **3D Game App: Onboarding**

Module 3:

- **3D Game App: In-Game UI Elements**
- **3D Game App: Main Gameplay**
- **3D Game App: Scoring System**
- **3D Game App: Timer System**
- **3D Game App: In-App Messaging System**

Module 4:

- **3D Game App: In-App Video/Audio Call System**
- **3D Game App: Uniuqe Username System**
- **3D Game App: Subsciption Model / Paywall**
- **Web App: Testing, Debugging & Launch**

Pre - Development:

App : Database Setup - Will be required to purchase and setup the database (by LISA) during the testing phase and prior to launching the app.

Web App Features:

UI/ UX Framework & Game Design - Develop and design the entire prototype (including all of the finalized screens that will be approved by LISA) and present/ deploy the project.

Landing Page - When App is opened, the landing page displays the app's main features/ advantages of signing up.

User Authentication - Users will be able to sign up for the app or login to an existing account. Includes "Forget Password" feature.

Onboarding - When App is opened the landing page displays the app's main features, introductory steps of the app, features and onboarding process for new user.

In-Game UI Elements - Player based three dimensional (3D) UI elements will be displayed at the top, left, right and bottom sides of the screen. These functions will also be connected to the database. Players will be able to select from stock sets of tile choices (design on back of tiles).

Main Gameplay - Main gameplay logic of the game will be implemented with a standard American Mahjong flow and scoring system applied. Game will be limited to up to four (4) players. Every turn another play will serve as the Dealer. The Dealer will always have an extra tile on hand.

Scoring System - Scoring is determined by a list of hands for the 2020 calendar year determined by the National Mah Jongg League. If initial scoring method is not adequate, FFP will implement a solution presented by Lisa.

Timer System - Users will be limited to 60 seconds to make a play when it is their turn. Timer warnings will occur at 20 seconds left, 10 seconds left, 5,4,3,2 & 1 second left. This will be represented with an animation as the timer runs down to zero (0).

In-App Messaging System- Users can communicate through an internal chat system with other users on their friends list via their unique username.

In-App Video & Audio Call System- Users can communicate through an internal video & audio call system with other users on their friends list via their unique username. Zoom API wil be implemented. If initial API implementation is not adequate, FFP will implement an alternate API or implement an API solution presented by Lisa.

Unique Username System - Users will now be able to sign up to the platform by entering a unique username. The system will perform a live check to check for the availability of that username. Upon successful verification, the user will be able to successfully register with a

unique username that other users will not be able to use once taken. This unique username will be used for In-App Messaging, Video & Calls.

Subscription Model/Pay Wall - Users will be able to sign up for an account and play on for a free during the 14 day free trial. Upon completion of the free trial the user will be charged a monthly fee to continue accessing the game site to continue playing. If initial API implementation is not adequate, FFP will implement an alternate API or implement an API solution presented by Lisa.

Account Settings - Users will be able to change user account information and change account passwords. Users will have the option to navigate to the "Help" page, log out and the "Legal" page.

Testing & Delivery - Bug Testing, debugging and prepare for delivery.

GAME LOGIC:

Equipment

- **152 tiles**
- **2 Dice**
- **4 Scoring Cards (Not included)**
- **Scoring Sticks or Coins**
- **1 Wind Indicator (optional)**
- **4 Racks (optional, but highly recommended)**
- **4 Pushers (optional, but preferred by players)**

Tiles

Your Mahjong set has 166 tiles. 152 are used in play and the rest are spares.

The 152 tiles are divided into four groups with their subgroups:

1. SUITS (108 tiles)

Circles or **Dots** (36 tiles - 4 of each)

Bamboos or **Bams** (36 tiles - 4 of each)

Characters or **Craks** (36 tiles - 4 of each)

2. HONORS (28 tiles)

Winds (16 tiles - 4 East wind, 4 South wind, 4 West wind, 4 North wind)

Dragons (12 tiles - 4 white dragons "Soap", 4 Green dragons, 4 red dragons). The white dragon tile on the left is also known as "**Soap**". Soaps can be used as zeroes when putting together certain hands.

3. FLOWERS and SEASONS (8 tiles - 1 of each)

4. JOKERS or Wild Tiles (8 tiles - all identical)

Jokers can substitute for any tile in a **Pung** (3 identical tiles), **Kong** (4 identical tiles), **Quint** (5 identical tiles) or **Sextet** (6 identical tiles). They cannot be used to substitute a tile in a Pair (2 identical tiles) or any single tile.

Dice

Two dice are used to determine the dealer (East) as well as to determine where to break the wall (explained later).

Score Cards

Scoring is determined by a list of hands determined by the National Mah Jongg League (NML). Each player keeps a card as reference for building hands and creating strategy.

Wind Indicators

Wind indicators come in different variations and are used to display the current wind (the player who starts off the round). The wind indicator is optional and not required for gameplay. It is also referred to as a better and is alternately used by a fifth person to place bets on which player will win. For wind indicators with only

Chinese characters, the translations are as follows:

東 - East (E)
南 - South (S)
西 - West (W)
北 - North (N)

Scoring Sticks and Coins

Scoring sticks or coins (round chips) are used to keep track of points and scoring. You can assign whatever point or monetary value you want to them and distribute in whatever quantity you want. The following is a suggested amount to be given to each player before the game starts:

QUANTITY	SCORING STICK / COIN	VALUE
1	9 dot / Yellow	200 points
2	5 dot / Blue	100 points
8	1 dot / Red	25 points
10	8 dot / Green	5 points

Racks and Pushers

Racks and pushers, while not mandatory, are highly recommended. Racks are assigned to each player to hold their hand of tiles. Alternately, you can line the tiles up on the table in front of you.

Pushers are "arms" that attach to each person's rack. They are very helpful when it's time to bring your portion of the wall to the center of the table for playing. Using a pusher also prevents you from accidentally exposing your hand while bringing your wall forward.

Starting The Game

A. Place one rack (and attached pusher, optional) in front of each player.

B. All 152 tiles are placed faced down in the center of the table and shuffled by all players.

C. Build the Walls. Each player builds a wall of tiles two tiles high in front of her rack as shown in the diagram below using all 152 tiles. Each wall consists of two rows of 19 tiles.

D. Determining Who is East. Each player roles the dice in turn. The player with the highest number becomes East (dealer). The player to her right is South, followed by West and then North.

E. Break the Wall. East rolls the dice and then counts off the resulting number from the stack of tiles in front of her, from right to left, and breaks the wall. For example, if East rolls an eight, East will separate eight groups of two tiles from the right end of the wall. Then, East takes the following four tiles (two from the top row and two from the bottom row).

Moving counter-clockwise, each player then takes turns where the dealer left off, taking four tiles (two from the top and two from the bottom) for herself. The process continues until each player has 12 tiles.

When all players have 12 tiles, East (the dealer) takes two additional tiles - the first and third tile from the top row (as shown below). This gives her 14 tiles. Moving counter-clockwise, the other players take one tile from the end (as shown below), giving each of them a total of 13 tiles.

Picking a Hand

Now the strategizing begins. Each player arranges the tiles on her rack in a logical order so she can start to realize her goal of putting together her mahjong hand. The goal of mahjong is to match your tiles exactly with a hand from the score card.

How To Read The Score Card

The hands on a score card are represented in numbers or letters in either red, blue, or green. The colors are not specific to any one suit, and different colors simply mean different suits have to be used. Flowers and zeroes are not considered to be part of any suit and will always be blue.

1-9	Correspond to the specific number on the tile (not including flowers)
N,S,E, W	North, South, East, West
D	Dragon
R	Red Dragon
G	Green Dragon
0	White Dragon (Soap)
F	Flower

The score card is organized into categories for hands based on common patterns:

YEAR	Patterns that make up a year, such as 2010. In such case 2's, 0's, and 1's would be used. White dragons are always used as zeros.
2468	Patterns that require even numbered tiles.
Change-up	This section varies
Quints	Hands that have at least one quint (5 indentical tiles) where at least one of which is a Joker.
Consecutive Runs	Patterns of consecutive numbers.
13579	Patterns that require odd numbered tiles.
Winds-Dragons	Patterns requiring wind and dragon tiles.
369	Patterns using 3's, 6's, and 9's.
Singles and Pairs	Patterns with single and paired tiles.

Each hand is grouped into several different combinations. Some combinations contain non-matching tiles, but most generally have two or more matching identical tiles. These are known as:

Pair	Two identical tiles.
Pung	Three identical tiles.
Kong	Four identical tiles.
Quint	Five identical tiles, with the use of Jokers.
Sextet	Six identical tiles, with the use of Jokers.

Next to each hand is the value of the hand for scoring or gambling purposes. Next to the hand is an 'X' or a 'C' indicating whether that hand is exposed or concealed (explained later):

X	Exposed
C	Concealed

The Charleston

Before actual play starts, it's time for **The Charleston**...

The Charleston is a ritual unique to American mahjong with roots to its beginnings in the early 1920's. It is an exchange of tiles that gives each player a chance to improve her hand by passing unwanted tiles face down to other players.

1)	Each player passes 3 unwanted tiles to the player to her right.
2)	Each player passes 3 unwanted tiles to the player opposite her.
3)	Each player passes 3 unwanted tiles to the player to her left, known as '**first left**'. The player is allowed to '**blind pass**' up to three tiles. A blind pass is taking the tiles received and passing them without looking at them.

The Charleston may proceed a second time if all the players agree. The second Charleston proceeds in the following sequence:

1)	Each player passes 3 unwanted tiles to the player to her left.
2)	Each player passes 3 unwanted tiles to the player opposite her.
3)	Each player passes 3 unwanted tiles to the player to her right, known as '**last right**'. The player may blind pass these tiles.

At the end of the second Charleston, a player may make an optional '**courtesy pass**'. The player may agree with the player across from her to exchange up to three tiles.

No jokers may be passed during the Charleston and courtesy pass.

During the Charleston you may want to change the hand you are aiming for. As tiles are exchanged you may discover another hand might be more ideal than the original one you had in mind.

Gameplay

The goal of each player is to win the game by being the first person to declare "**Mahjong**" by correctly creating a hand that exactly matches a hand on the score card.

Drawing and discarding tiles

Now the excitement begins as each player tries to improve her hand. Since East has 14 tiles, she starts the game by discarding a tile. If the discarded tile is not called (claimed by other players), the turn continues to the next player on the right. The next player draws a tile from the wall. The tile is taken from where the breaking of the walls was left off. When a player draws a tile from the wall, she takes the top tile if the next tile in the stack is two tiles high, otherwise, she takes the bottom tile.

The player either decides to discard the drawn tile or to place it in her hand and then discard another tile from her hand. The name of the discarded tile is announced and placed face up in the center of the table. Caution must be used here since each tile you discard is seen by the other players and it won't be long before they figure out what kind of hand you are trying to build.

If the discarded tile is not called, the turn continues to the next player on the right. The sequence of drawing, discarding, and continuing turns is repeated unless interrupted by a call.

Calling Tiles

The most recent discard may be called by any player if the tile completes a pung, kong, quint, sextet, or another combination of an **exposed hand** (a hand marked with "**X**" next to its value on the score card).

- A tile may not be called to complete a combination of the hand that requires only a single tile.

- A tile may not be called to complete a pair unless it completes a mahjong hand.

- Tiles discarded prior to the most recent cannot be called and are dead tiles.

If a player calls to take a discarded tile and it does not result in mahjong, the combination it completes must be **exposed** face up on top of their rack for everyone to see and cannot be changed for the rest of the game. The player then discards a tile and if it isn't called by another player, the turns continue with the player to the right. Note that some players may have their turns skipped when a tile is called.

There are provisions when more than one person calls:

- The player who calls a tile to complete a mahjong hand trumps calls by any other player to complete a set.

- When none of the calls are to complete a mahjong hand, the player nearest in turn receives the discard.

Note: When aiming for a **concealed hand** (a hand marked with a "**C**" next to its value on the scorecard), all of the tiles in your hand must be drawn from the wall. None of them may be called tiles except for the last tile which would allow you to declare Mahjong.

Joker Rules

Jokers can substitute any tile in a pung, kong, quint or sextet combination. They may not be used to complete a pair or single tiles in a hand.

If a player has an exposed combination with a joker substituting a tile and you have the actual tile the joker is substituting, you may exchange that tile for the joker in the following manner:

- Call a discard or draw a tile from the wall on your turn as you normally would.

- Exchange the actual matching tile with the exposed substituting joker. Multiple matching tiles may be exchanged for multiple exposed jokers.

- Discard a tile to maintain the proper tile count in your hand. After exchanging for a joker, it is not necessary to expose tiles if that joker creates a combination in your hand. Jokers exposed in **dead hands** (hands that are out of the game due to violating rules), may be exchanged.

Ending The Game

The game ends when either someone declares "**mahjong**" or when there are no more tiles in the wall to be drawn.

Mahjong

When a 14th tile drawn from the wall or called from a discard completes a hand on the score card, a **mahjong** is created. The player then declares "Mahjong" and wins the game.

The payout to the winner is based on the value of the hand and how the mahjong was created:

TYPE OF MAHJONG	PAYOUT
Mahjong made off a discard.	Discarder pays the winner double the value of the hand. All other players pay single value.
Mahjong made off a draw from the wall.	Each player pays double the value of the hand.

Mahjong made off a discard, contains no jokers, and is not from the Singles and Pairs category.	Discarder pays the winner four times the value of the hand. All other players pay double value.
Mahjong made off a draw from the wall, contains no jokers, and is not from the Singles and Pairs category.	Each player pays four times the value of the hand.

Draw

If mahjong has not been called and all the tiles have been drawn from the wall and the last discard has been made then the game ends in a draw. No payouts are made.

After The First Game

Now that the first game is complete, the position of East (dealer) moves to the person on their right. After each game, the position of East continues to move counter-clockwise. The process of shuffling the tiles, rebuilding the walls, and dealing is repeated until the games end.

Additional Rules

Occasionally mistakes are made such as erroneous discards, incorrect exposures, or calling mahjong incorrectly. In such cases there may be penalties. Below are general guidelines regarding errors:

ERROR	PENALTY
An accidentally discarded tile has touched the table or been announced.	Tile cannot be taken back.
A tile has been announced incorrectly.	Tile cannot be claimed.
A tile is called but no exposure has been made.	The call may be retracted.
An incorrect exposure has been made.	The exposure may be corrected prior to discarding.

A player has too few or too many tiles.	The player's hand is **dead** (out of the game) but will pay the winner just like all the other players at the end of the game.
Three players have too few or too many tiles.	The game is replayed.
A player's hand is discovered by another to be impossible, based on the tiles exposed on their rack.	The player's hand is dead.
Mahjong is declared in error but the hand has not been exposed.	No penalty and the game continues.
Mahjong is declared in error and the hand is exposed.	The player's hand is dead. The player pays the winner of the game.