Immortal Blade

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Technical Specifications

1. When the player clicks the start game button, the system will change the page and display a view of all characters and enemies for the game.

2. When the player is finished selecting the characters and enemies for the game, the system will continue and start the gameplay. If no characters or enemies were selected, the system will prompt the user to make selection.

3. When the player is finished selecting the characters and enemies for the game, the system will allow the user to start the game by and display the battlefield and menu.

4. When the gameplay begins, the system will display all characters and enemies on the screen with the appropriate menu to interact with the game.

5. When the game has begun, the system will display clear visual indicators that will highlight the current turn in the round.

6. During the gameplay, the system will provide an option for the player to pause the game by clicking the pause button and resume the game by clicking continue or resume.

7. When the game is paused, the system will provide an option to restart the game with the same characters in the initial state by clicking the restart button.

8. When the game is paused, if the player clicks on exit, the system will change the page to the main menu. Then if the player selects a new game, the previous game state will be reset to allow for a new selection of characters and start a new game.

9. When the player hits the pause button, an image of the controls will display, alongside a resume and exit.

10. When the game is paused. Display a button that will display a description of the mechanics of the game.

11. When the player clicks on the tutorial button, before the character selector, display changes to the tutorial. After the character selection page, this option is removed.

12. The gameplay page initiates with all characters and enemies displaying their current health. As unit health changes, the health displays changes accordingly.

13. As the game progresses, enemies will display their aggro targets. As the value changes internally from attack actions, the target display changes based on the highest aggro value.

14. When it is a character's turn, their action list will display. Once their turn is up, the action will change to the characters action list.

15. The player will check if the character has a valid status in order to choose what move they would like their character to do.

16. The player has to set a specific target so the character knows where to perform the abilities that they were told to perform.

17. A player can take a variety of turns in one go as long as the character has enough Action Points(APs), so that the user can play the game in a smarter way rather than the game moving on after one ability

18. Next to the battle menu there should be a Resources tab where the player will be able to see the status of your character and the abilities to choose from.

19. The player will be notified that they have won the game and that it’s over with a winning screen.

20. The player will be notified that they lost the game and that the game is over by a losing screen being displayed.

21. The player will be able to play again if they would like to restart a match.

Use Case Scenarios

Player Using Battle Menu	Check Character Stats
	See Active Character Resources
	See Active Character’s Available Actions
	See Description/Cost of Available Actions
	Select Action from List of Available Actions
	Deselect Action Before Choosing Target

External Interfaces

This system will use an external database to store information about characters and enemies. When the game is loaded, players will be provided with a list of characters and enemies to choose from that is populated by this database.

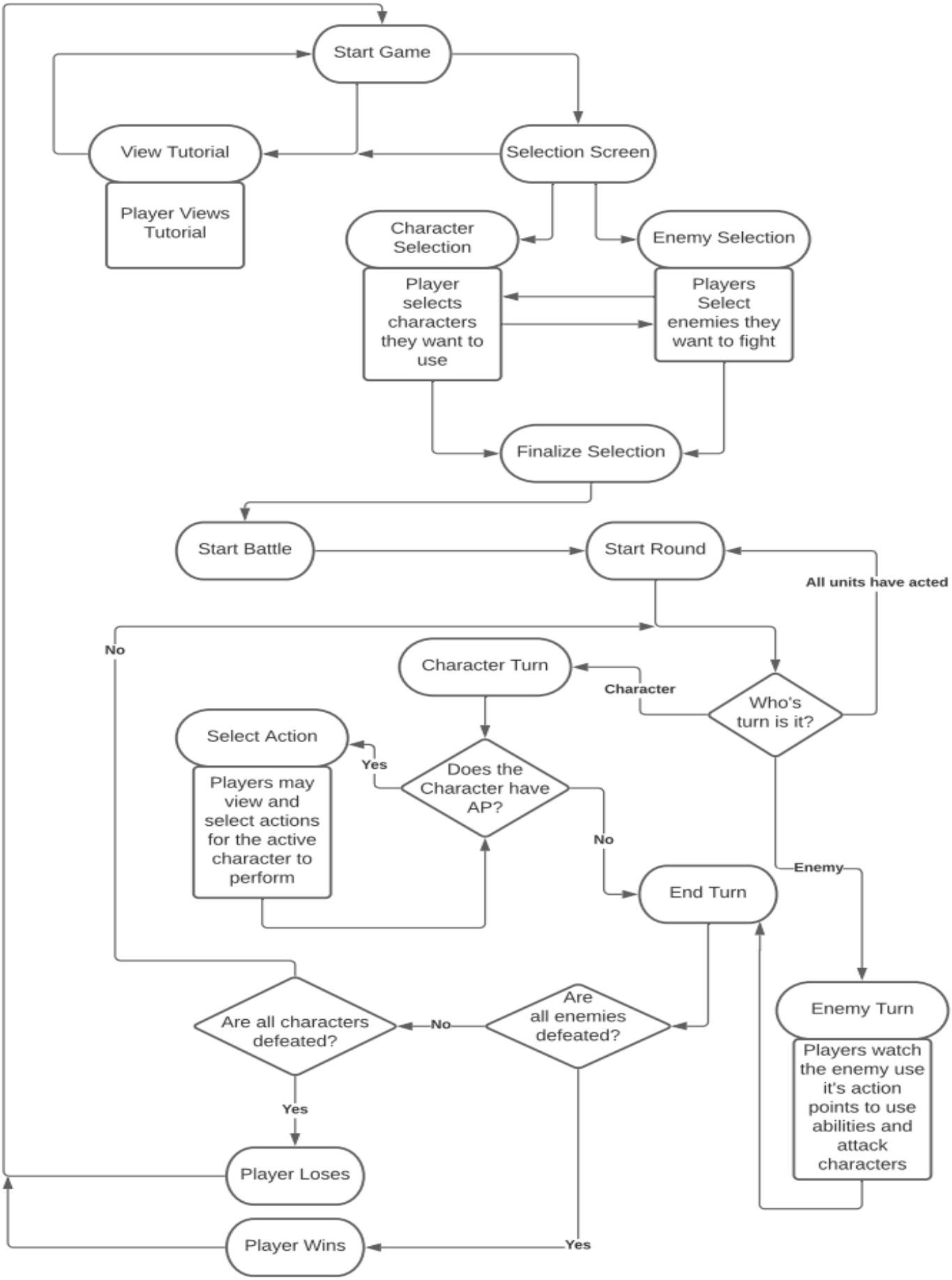
API Calls

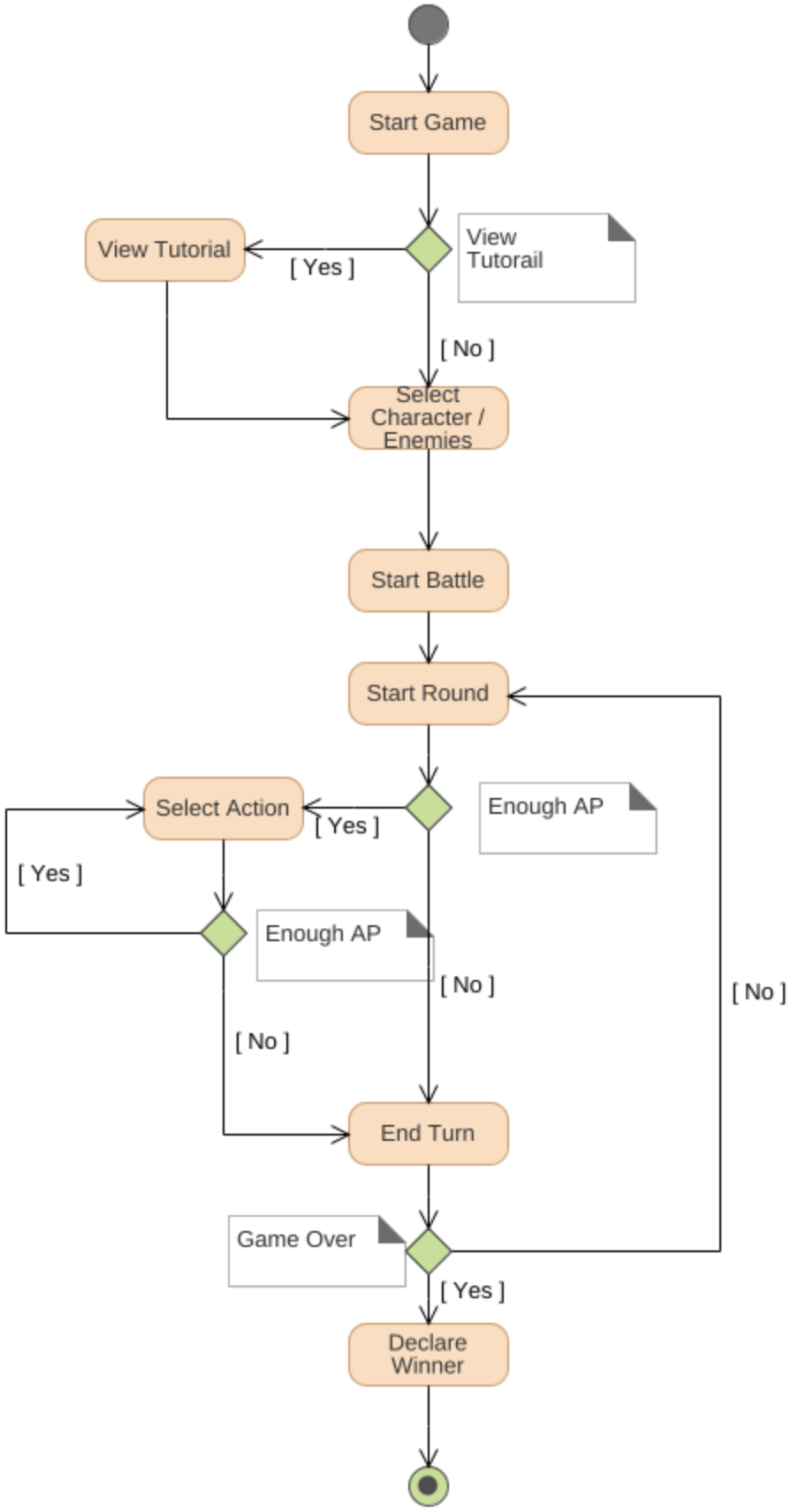
There will be one call when the program starts to populate the selection screen. It will retrieve names and descriptions from the database for the available characters and enemies.

Once the player has made their selections and starts the game, there will be a second call that retrieves all of the data for each character and enemy they selected.

Stretch Goal: There will be a login system for players so that they can store selections so that they can re-try previous battles. This will require sending and retrieving player data to and from the database.

List of Steps/Activity Diagram




Start Game
View Tutorial
[Yes]
View Tutorail
[No]
Select Character / Enemies
Start Battle
Start Round
Select Action
[Yes]
Enough AP
[Yes]
Enough AP
[No]
[No]
[No]
End Turn
Game Over
[Yes]
Declare Winner

Class Diagram

Unit

Variables

Stats
- Base Strength
- Strength Modifiers {}
- Base Willpower
- Will Modifiers {}
- Base Dexterity
- Dexterity Modifiers {}
- Base Focus
- Focus Modifiers {}
- Base Defense
- Defense Modifiers {}
- Base Agility
- Agility Modifiers {}

Resources
- Max Health
- Current Health
- Max Action Points
- Current Action Points
- Max Essence
- Current Essence
- Tension

Other
- Actions {}
- Resistances {}
- Damage Bonuses {}
- Evasion Chance
- EvasionModifiers {}
- Block Chance
- BlockModifiers {}
- Status

Methods

- PerformAction(Action, Targets)
  Run **This.SelectTargets(),** then perform one of the unit's available actions.
- TakeDamage(inDamage, Caster)
  Reduces damage from attack based on defense, resistances, evasion chance, and block chance. Then reduces **CurrentHealth** by the remaining number. <Caster value only used by Enemies>
- EssenceBurn(difference)
  Reduces **CurrentHealth** based on difference
- CheckHealth()
  If **CurrentHealth** <= 0, set **Status** to Incapacitated and **CurrentHealth** to 0
  If **CurrentHealth** > 0 AND **Status** == Incapacitated, set status to active
- CheckModifiers()
  Call ChangeDuration, and removes any with a duration <= 0.
- CheckAP()
  If ap is lower than lowest action ap cost, end turn.

Action

Variables

AP Cost
Essence Cost
Caster
Targets {}
Category
Revive
Targets
PotentialTargets {}
TargetConditions

Methods

- SpendResources()
  Spends AP and increases Essence of the caster. Then if CurrentEssence exceeds MaxEssence, set current equal to max and run **Caster.EssenceBurn(difference)**
- FindTargets()
  Populate **PotentialTargets** with targets based on **TargetConditions**
- PopulateTargets()
  Run **Caster.SelectTargets** to populate **this.targets**

Character <Extends Unit>

Variables

Evade Pity
Block Pity

Methods

SelectTargets(Action)
Take Player Input to select targets from **Action.PotentialTargets** for the action being performed

Attack <Extends Action>

Variables

Accuracy
Critical Chance
Damage Ratio
Number of Hits
Attribute

Methods

- Attack(Number of Hits, Targets)
  For each target in Targets, Run **Damage()** for each **Number of Hits**
- Damage(Hit(), Crit(), MyStr/MyWill, MyBonus {}, Damage Ratio,)
  If **Hit()** returns true, calculates the amount of damage dealt to the target.
  Also calls the target's **TakeDamage()** Function.
- Hit (Accuracy, MyDex/MyFocus, MyTension, TargetAgility)
  Returns true or false based on wether or not the attack hit.
- Crit(CriticalChance)
  Returns true if the attack scored a critical hit.

Modifier

Variables
Name
Modifing Stat
Effect
Duration

Methods
- ChangeDuration()
  Subtracts 1 from each modifier duration, and removes any with a duration <= 0.

Round Counter

Variables
TurnOrder []

Methods
- PopulateTurnOrder()
  Populate TurnOrder lis with all units by agility, randomizing any equal scores.
- TakeTurn()
  Iterate though TurnOrder, giving unit action.

Enemy <Extends Unit>

Variables

Aggro Table

Methods

- TakeDamage(inDamage, Caster)
  In addition to the normal effects of TakeDamage, increase the Caster's aggro in Aggro Table
- PopulateAggro()
  At the start of battle, add all chracters to the table at 0.
- UpdateAggro()
  Find the lowest value in the table, then subtract all values in the table by that number, then set the aggro of any incapacitated characters to 0.

SelectTargets(Action)
For each target in **Action.PotentialTargets**: Choose targets starting with the character who has the most aggro for the action being performed
If multiple characters have the same aggro, or if enemies are being targeted, then randomly select the target.

Support <Extends Action>

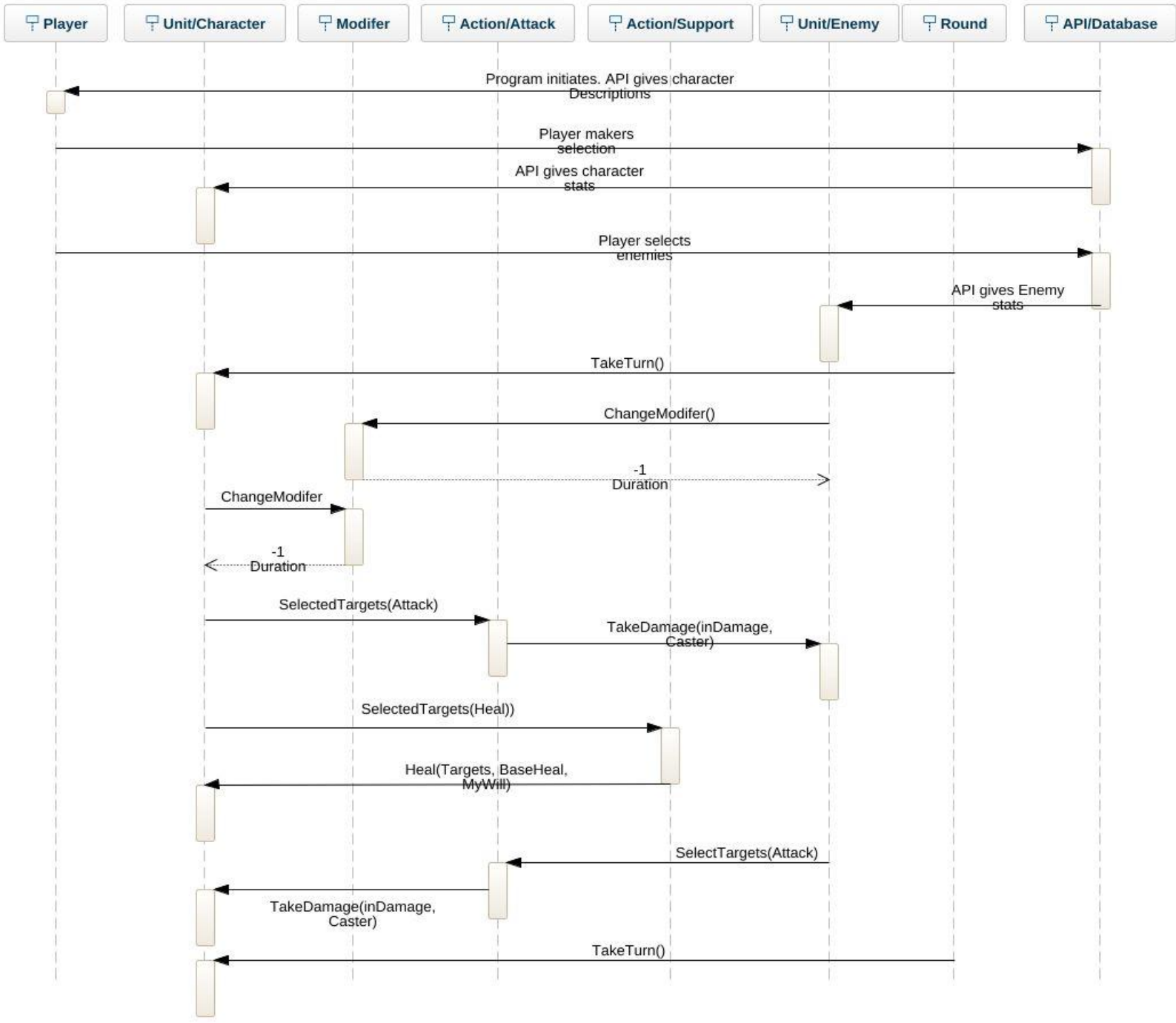
Variables

BaseHeal
ModList {
  name:
  stat:
  value:
  duration:
}

Methods

- Heal(Targets, BaseHeal, MyWill,)
  If **BaseHeal** is Not Null: For each target in **Targets** that is NOT incapacitated, Increases the target's **CurrentHealth** based on **BaseHeal, MyWill**, and a precentage of the difference between the targets **MaxHealth** and **CurrentHealth.**
- Modify(Targets, ModList)
  If **ModList** is Not Null: For each target in **Targets**, apply each modifier in ModList
- Revive(Targets)
  For each target in **Targets** that is Incapacitated: Increase the target's CurrentHealth based on **BaseHeal** and **MyWill,** and run **Target.CheckHealth()**

Sequence Diagram



Class Responsibility Collaboration chart

Unit Character	
Responsibility	Collaborators
Start turn	Round
Check modifiers and lower duration	Modifier
Attack enemy	Action/ Attack
Heal party character	Action/ Support
Take damage to character	Action/ Attack
End turn	Round

Modifier	
Responsibility	Collaborators
Check modifiers and lower duration	Unit Character
Check modifiers and lower duration	Unit Enemy

Action/ Attack	
Responsibility	Collaborators
Attack Enemy	Unit Character
Attack Character	Unit Enemy

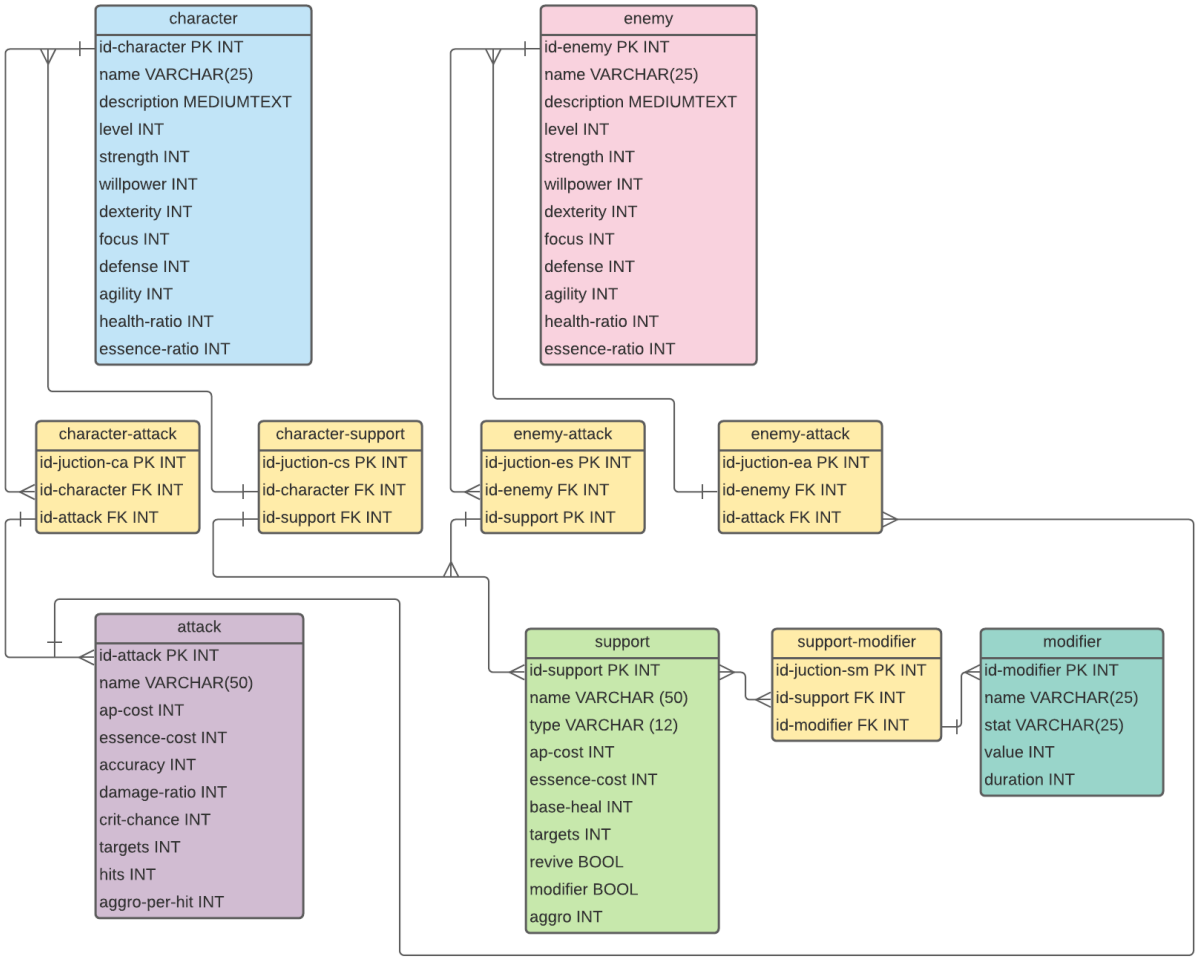
Action/ Support	
Responsibility	Collaborators
Heal party character	Unit Character

Unit Enemy	
Responsibility	Collaborators
Start turn	Round
Check modifiers and lower duration	Modifier

Attack Character	Action/ Attack

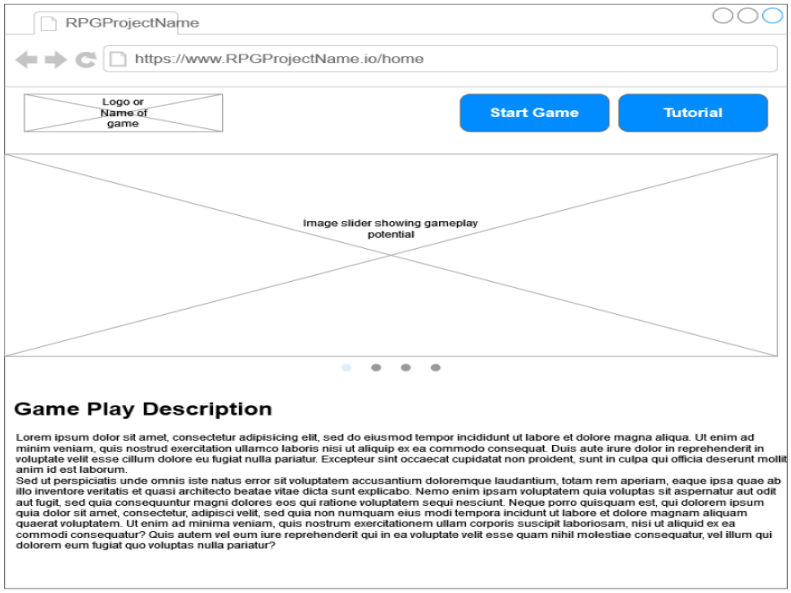
Round	
Responsibility	Collaborators
Start turn	Unit Character
Start turn	Unit Enemy

Entity Relationship Diagram

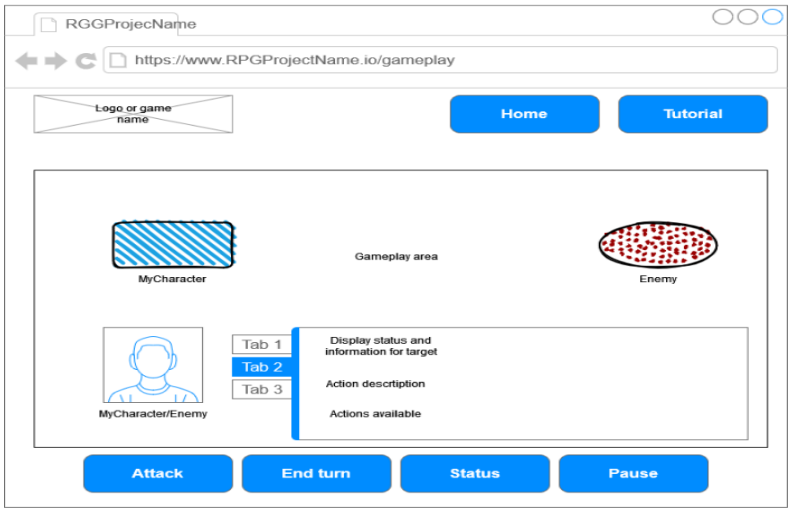


Wireframe Diagram

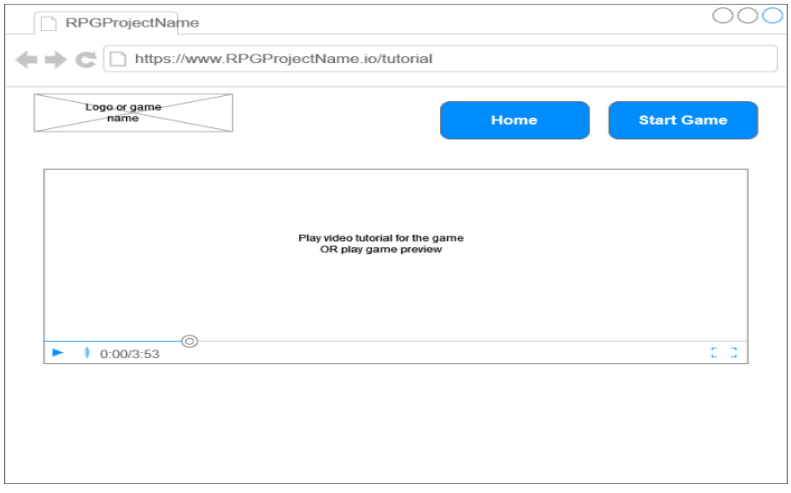
Homepage



Gameplay Page



Tutorial Page



Task Object Responsibility Chart

Object	Responsibility
Unit - PerformAction()	Call functions from the selected Action class to perform said action
Unit - EssenceBurn()	Take a value passed from Action.SpendResources() and use it to calculate how much to reduce the unit's currentHealth by.
Unit - CheckHealth()	Any time the value of currentHealth changes, set status to the correct value: - good: currentHealth/maxHealth > 0.5 - low: 0.5 >= currentHealth/maxHealth > 0.25 - critical: 0.25 >= currentHealth/maxHealth > 0 - incapacitated: currentHealth = 0
Unit - CheckModifiers()	Iterate through the unit's list of modifiers, call that modifier's ChangeDuration function, and then remove any modifiers that have a duration of 0 or less.
Unit - CheckAP()	Get the AP cost of each action in the unit's list of actions, then force the unit to end it's turn if it does not have enough AP to use any of those abilities.
Character - SelectTargets()	Using the input action's number of targets, take user input to select targets for the action.
Character - TakeDamage()	Take an integer value passed from Attack.Damage() and apply values from the object calling TakeDamage() to modify the original amount. Then reduce the object's currentHealth value.
Enemy - PopulateAggro()	Add each Character participating in the battle and add them to the enemy's aggro table
Enemy - UpdateAggro()	At the end of the enemy's turn, find the character in the enemy's aggro table that has the lowest amount of aggro. Then, subtract that amount from all entries in the table so that the lowest value is set to 0 and thus becomes the new baseline value
Enemy - SelectTargets()	For each target from the input action, select the highest value in the enemy's aggro table that has not already been selected as a target. Randomize tied values.
Enemy - TakeDamage()	Take an integer value passed from Attack.Damage() and apply values from the object calling TakeDamage() to modify the original amount. Then reduce the object's currentHealth value. Then, use the attack's aggro per hit value to update the caster's entry in the aggro table.

Action - SpendResources()	Spend AP and Essence from the unit running the current action, and then run essence burn if the essence cost of the action exceeds their maximum essence
Action - FindTargets()	Create a list of potential targets for the action
Action - PopulateTargets()	Use the unit's select targets function to create a list of selected targets
Attack - PerformAttack()	For each target in the list of selected targets, run the deal damage function a number of times equal to the attack's specified number of hits.
Attack - DealDamage()	Run the attack's hit and crit functions to determine the amount of damage dealt by the attack, and then pass that value on to the target's take damage function.
Attack - Hit()	Use the stats from the target and the unit performing the action to determine the hit chance for the atack, then run the helper class's two random number function to determine whether or not the attack hit the target. Returns "miss" "hit" or "bonus" depending on the result.
Attack - Crit()	Uses the helper class's single random number function to determine whether or not the attack scores a critical hit based on the attack's critical chance.
Support - Heal()	If the support action has a base heal value, then increase the target's current health based on the action's base heal, the caster's willpower, and the target's missing health (max health minus current health)
Support - Modify()	If the support actions list of modifiers is not empty, add each modifier in the list to the target's list of modifiers
Support - Revive()	If the action allows targets to be revived, allow incapacitated targets to be healed using the support actions heal function. Otherwise, do not allow them to be targeted by the action.
Modifier - ChangeDuration()	Have the modifier increase or decrease it's own duration by the specified amount.
Game - PopulateTurnOrder()	Sort every unit participating in the battle into a list based on their agility value.
Game - TakeTurn()	Iterate through the list generated by the populate turn order function. Have each unit in the list take their turn when they are called by this function.

Helper - OneRandom Number()	Randomly generate an integer value between 1 and 100, and return the result (return it in an array to be consistent with the output of two random numbers?)
Helper - TwoRandom Numbers()	Randomly generate two values between 1 and 100, and return an array containing both results.