Design Journal

for

Gin Rummy

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# Introduction

## What is this design journal for?

This design journal is meant for a Web version of the card game, Gin Rummy. It is to be built so that games can be played against an AI opponent from any popular Web browser.

## How are the sections organized?

Most sections are ordered into the chronological order that they were done during the design process. The first section is reserved for use with the introduction and the last section is reserved for the data dictionary so that they may be found in their expected locations.

## Updating of sections

As new sections of the design journal bring to light faults or previous ignorance in the design process, older sections will be updated to try to keep the whole documentation from contradicting itself. If it is found that contradictory information still exists in this document, then the newer (later) sections should be used for determining the correct information.

## Source of Rules Used

### Link

<https://cardgames.io/ginrummy/>

### Reason

This provides a playable version of the game along with rules that are well written, easy to read, and to understand. Not all rules are used as some are house rules that I felt would worsen the game to include.

# Data Dictionary

1. Big Gin – When a player has drawn a card but not yet discarded a card and all 11 cards in their hand forms melds; It is worth 31 points extra
2. Deadwood – The cards and their points that are or will be harmful to the player that has them as they are not eliminated by being a part of a meld
3. Game – An entire playthrough of Gin Rummy with multiple rounds played until a score has been reached
4. Gin – When a player knocks with their hand having no remaining deadwood; It is worth 25 points extra
5. Hand – The (10-11) cards being held and interacted with by a player
6. Knock – When a player places a card face down onto the discard pile and their remaining deadwood (as the discarded card does not count) is 10 or less
7. Laying off – When a person knocks (not Gin) the opponent is able to ‘lay off’ deadwood by playing their cards off the knocker’s melds
8. Meld – A set or run
9. Rank – The letter or number found on standard playing cards (Ace to King)
10. Round – A single iteration of having cards dealt out, players playing, and being ended and scored when a person knocks or goes Big Gin
11. Run – Three or more cards that are of the same suit and increment by one from one another like (3,4,5), (Ace,2,3,4), (9,10,Jack,Queen,King), etc.
12. Set – A three or four of a kind for a rank like (4 of Hearts, 4 of Clubs, 4 of Spades); These are often referred to as rises
13. Shutout Bonus – If a player dominates their opponent using skill and/or luck and wins every round played in the game, then their points for that game are doubled as a reward
14. Suit – The shape/symbol found on a playing card (Diamonds, Hearts, Spades, Clubs)
15. Undercut – When a person knocks (not Gin) but their opponent ends up with less or equal deadwood then them during scoring, then the opponent wins the difference in addition to the undercut bonus of 25 points

# The SOLID Principles

## Why is this included

The SOLID principles are included in this design journal as to be a part of the design process from the get-go. Even though these principles would likely be still be applied to the design process, having them listed here can help to show areas of improvement related to them a lot quicker.

## Sources

1. https://www.digitalocean.com/community/conceptual\_articles/s-o-l-i-d-the-first-five-principles-of-object-oriented-design
2. https://www.baeldung.com/solid-principles

## S – Single Responsibility

The single responsibility principle pushes for classes to do one specific type of task and to do that task well. Instead of a MouseAndKeyboard class, a better following of this principle would be something like having a Mouse class and a Keyboard class.

## O – Open Closed

The open closed principle pushes for classes/objects to be open for extension but closed for modification. The public interface for methods should remain the same and results produced by these methods should not be altered in a way that causes breaking changes.

## L – Liskov Substitution

Liskov’s substitution indicates that a subclass should be able to be used in the place of a superclass without causing functionality to work in unexpected ways for the caller. A tabby cat should be able to be used in the place of a cat to call upon to meow, hiss, and such without performing erratically.

## I – Interface Segregation

The interface segregation principle states that an object/class should not have to fulfill contracts for behavior that does not relate to them. Having IRunningActor, ISwimmingActor, and IFlyingActor as interfaces is better than having a IMovingActor interface that requires the implementation of it to have details for running, swimming, and flying even if the actor cannot do one of these things.

## D – Dependency Inversion

The dependency inversion principle states that abstractions be relied upon rather than concrete implementations. By allowing the most abstract but relevant type to be used, reuse of code is improved, and as new features are added to systems, code can connect to the new but similar types.

# Use Cases

## Brief Overview

1. Navigating to the Webpage
2. Selecting whether to do standard Gin Rummy or ‘Around the World’ Gin Rummy
3. Select the difficulty of the opponent to be played against
4. Select the number of points to play the game for
5. Start the game
6. View the rules
7. Reposition cards in their hand
8. Make the kickoff move(s) of the game
   1. Discard draw or pass the turn
9. Draw from the deck
10. Draw from the discard pile
11. Discard a card from the hand
12. Knocking
13. Going ‘Big Gin’
14. Quitting the game
15. Restarting the game

## Navigating to the Webpage

### Scenario

Actor:

1. Player

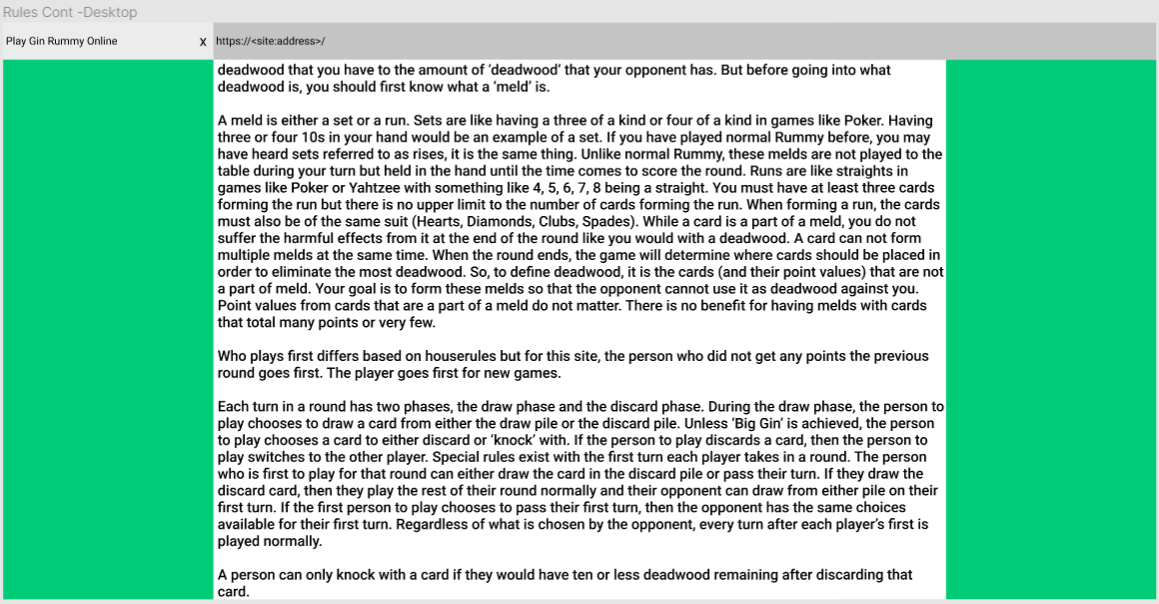
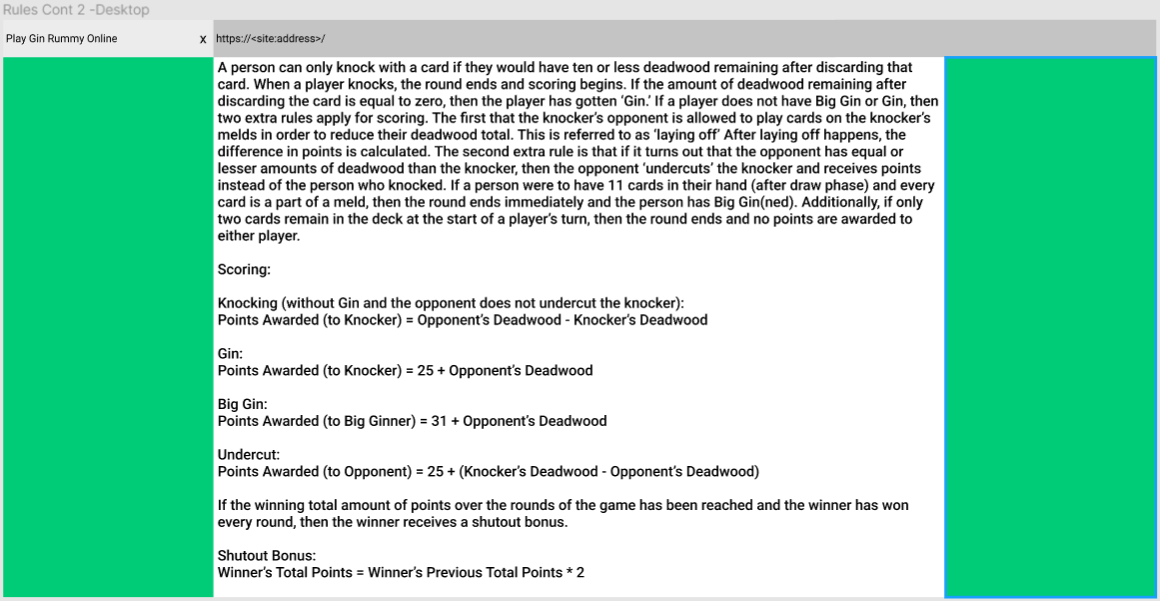
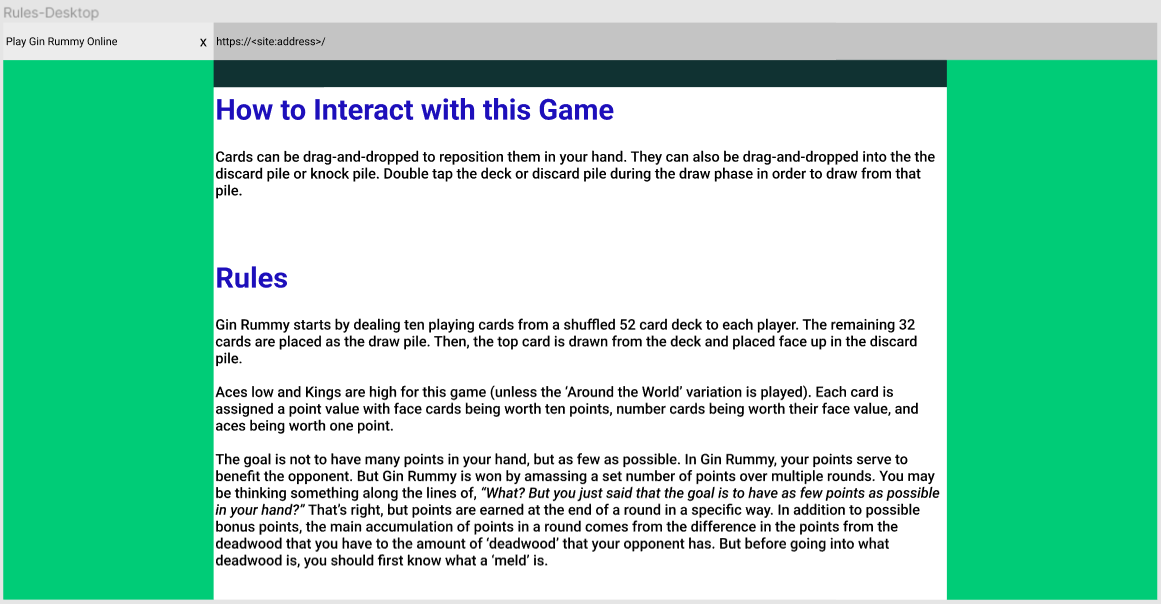
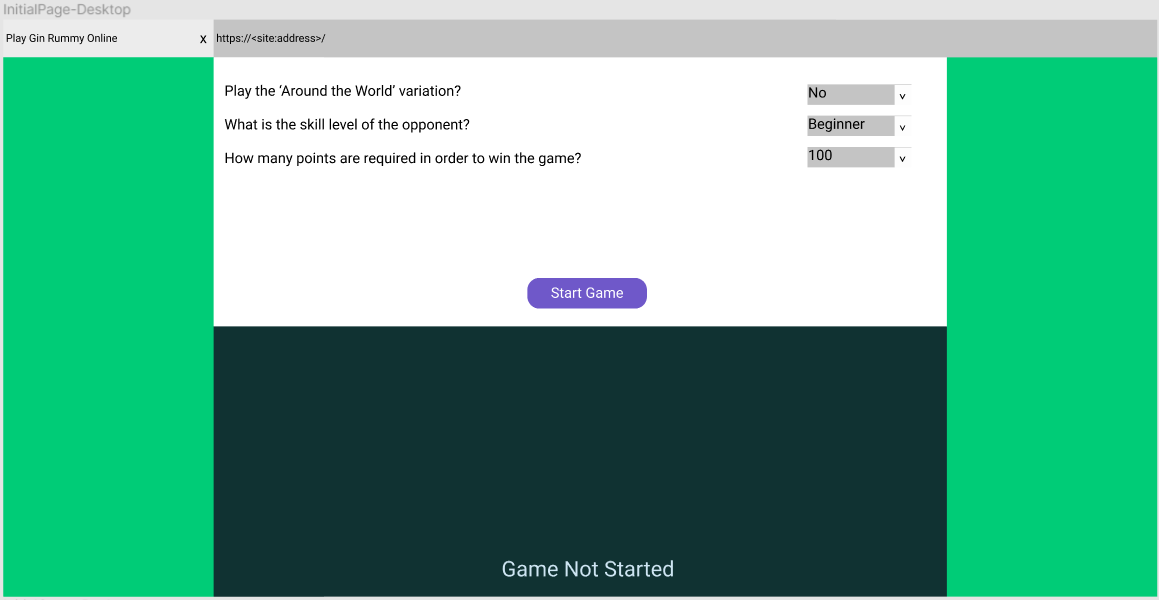
Main Success Scenario:

1. The player finds the website using their search engine or by typing in the URL
2. The player submits the URL to their Web browser or clicks on the link provided by their search engine
3. The page where the game can be played loads in front of them
4. The tab for the page says “Play Gin Rummy Online”
5. The URL they end up at is https://<site:address>/
6. If the person is on a computer or other device with a large resolution, then green borders are seen on the left and right side and the content is centered
7. The top of content contains three settings, “Play the ‘Around the World’ variation?”, “What is the skill level of the opponent?”, and “How many points are required in order to win the game?” along with dropdowns containing the default values, “No”, “Beginner”, “100” respectively
8. A purple button with “Start Game” appears below
9. A dark slate gray box appears underneath that with some centered white text stating “Game Not Started”
10. Farther down the page is a description of how to interact with the game on this page and the rules used (refer to the included design images)

Guarantee:

1. The Webpage will load
2. Settings will be available for the player to alter
3. A start game button and box for the game appears
4. Rules and interaction instructions are at the bottom of the page

### Design Images



# Functional Requirements

## Host a playable game of Gin Rummy on a Webpage

## Allow the player to choose Standard Gin or ‘Around the World’

## Provide a computer-controlled opponent for the player to play against

## Allow the player to choose a difficulty level for the game

## Allow the player to set the number of points to play until

## Start the game

## Limit the beginning of each round to either draw from the discard pile or pass the turn

## Maintain whose turn it is to play

## Have the opponent appear to take three seconds for each decision

## Allow the player to draw from the draw pile

## Allow the player to draw from the discard pile

## Allow the player to reorganize the cards in their hand

## Show the scoreboard for five seconds after each round and for ten seconds after each game

## Support drag-and-drop operations

## Display the rules for the player

## Allow the player to discard a card from their hand

## Allow the player to knock to end the round

## End the round due to a lack of cards

## End the round when a player has Big Gin

## End the game when a player has won

## Determine the best combination of melds and points to layoff

## Restart the game

## Notify of an illegal move

# Design Story

# UI/UX

## Color palette

Generated using: https://coolors.co/generate



# CRC Cards

# Design Patterns