Project Name: 31 Game

Project Description:

31 is a simple draw and discard game. This project will create a player versus computer version of the game. Players are dealt and maintain three cards in their hand. The goal is to collect cards in a single suit worth the closest to or exactly to 31 points..

Goals:

- ✓ In each hand of the game, be the first to collect near or exactly 31 points in a single suit.
- ✓ Losing a hand incurs the loss of a token.
- ✓ A player loses the game when he loses all of the game tokens including the last chance token.

Rule Set: (Here's how we play!)

Rule	Context Sensitive Rules
The player can exit the game at any time via clicking on the quit button.	
At the beginning of the game each player is given three Game Tokens.	
When a player has lost his last token he is given a Last Chance Token.	
When the player has lost his Last Chance Token then the game is over.	
A standard 52 card deck is used.	
A player's hand consists of three cards. A hand is scored according to the cards' values and suits.	❖ Cards 2 - 10 are worth face value (3 is worth 3 points, 4 is worth 4 points...) ❖ Cards J, Q, and K are all worth 10 points each. ❖ Ace is worth 11 points. ❖ The hand's worth is the highest number of points that can be found in any one suit. ❖ Exactly 31 points is earned if the hand has an ace and two ten -point cards all in the same suit.
A unit of game play is called a "round".	❖ A round begins with the cards being **dealt** to each player. ❖ Each player takes his **turn** until one player has 31 points or one player "knocks" and the other player takes one more turn. ❖ When the above has occurred, both players **lay down** their cards. ❖ The player with the lower score loses a token. At this point the round is over. ❖ At the end of a round if both players have at least one token (of any kind) then play continues with another round. If not, then the game is over and the player with at least one token is the winner.
The "deal" begins a round.	❖ The computer plays the part of dealer. ❖ Starting with the human player, three cards, one at a time, are dealt to each player. ❖ The computer player's hand is dealt face down. ❖ The human player's hand is dealt face up. ❖ The top card of the deck is turned face up and placed in the discard pile. ❖ All remaining cards are placed in the deck pile.
At any point in time, if a player has exactly 31 points then they immediat**ely go to Lay Down and win the** hand. This is handled by the computer.	
Starting with the human player, each player takes a **turn.**	❖ If the player is close to 31 points and believes that he has more points than his opponent can achieve in one more turn he may "knock" by clicking on

	the knock button. At this point the UI is updated so that the players know that a "knock" has happened. The rest of the turn is forfeited and the opponent has just one more turn before both players lay down their hands and see who wins the round. This must happen at the beginning of a turn.
	❖ The player, not choosing to "knock", either clicks on the top of the deck or clicks on the top of the discard pile. That card is moved to his hand.
	❖ The player must discard a card of his choice to the discard pile by clicking on the card. If a player picks up the top card on the discard pile he may not discard that card in this turn.

	❖ The turn is over and other player's turn begins
	   ○ If this player "knocked" then the other player gets one more turn.
	   ○ If no player has "knocked" then the other players get a turn.
	   ○ If a player has "knocked" and it was not this player then stop turns and go to Lay Down.

Lay down.	❖ The computer's cards are turned face up. ❖ Each player's hand is scored and the points are displayed in the UI. ❖ The player with the lower score loses a token. ❖ In the case of a tie then no one loses a token.

Input:

Device	Button	Context	Function
Mouse	Left_Release	on Deck or Discard pile	Begin player's turn or ignore if turn already begun.
	Left_Release	on Player's card	Activate discarding card logic.
	Left_Release	on Play, Quit, Knock Button,	Activate the underlying button.

Environment:

The main level playing area houses the cards for the game and the UI. The space houses the deck of cards, the discard pile, the computer player's face down, the computer player's tokens, the player's cards face up and the player's tokens.

Player:

In each hand, the player holds no more than three cards and attempts to collect as close to or exactly 31 points in any one given suit. At the start of the game, each player is given three game tokens. Each hand that a player loses results in losing one token. When the player's tokens run out he is given one last chance token and when that is lost, the game is over.

UI:

The User Interface needs to supply the player with feedback:

- ❖ The name of the game
- ❖ The number of game tokens that each player currently has
- ❖ An icon representing that a player has knocked

- ❖ Each player's points
- ❖ An icon to indicate whose turn it is
- ❖ The knock button
- ❖ The quit button

Tokens:

These are objects that the player uses to represent the player's score. Each player starts with three game tokens. Every hand that a player loses they lose a game token. When all game tokens are lost then the player receives one last chance token. When that token is lost, the game is over. The player with tokens left is the winner.

Pseudo-code & Flowchart
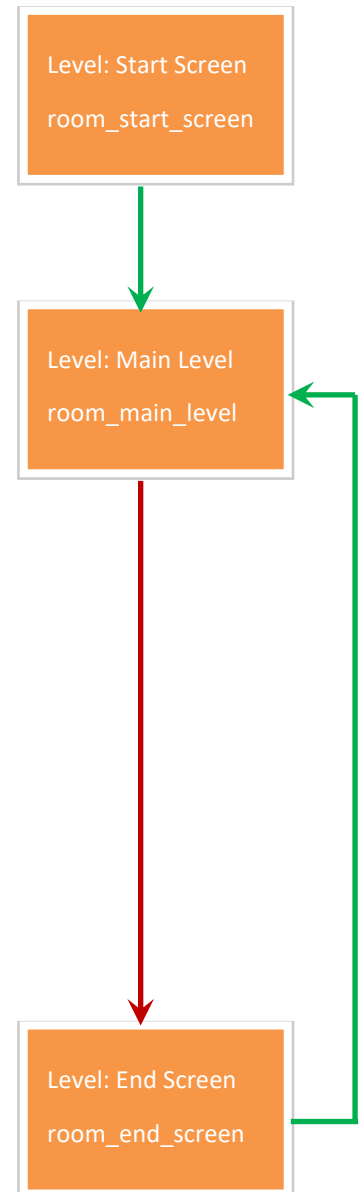
Start Screen

If the "Play" button is clicked,

      Then move on to the Main Level.

If the exit is clicked,

      Then quit the game.

Else,

      Keep displaying the Start Screen.

Main Level

When time to deal a round:

      Shuffle the deck

      Deal the cards

      Place the deck in the playing area

      Set turn variable to "player"

      Update UI

      Score both hands

      If either hand's score = 31

            Perform Lay Down

      Else,

            Start turn.

When Left_Released is used on deck_pile card:

      If the player's turn and a card has not been picked,

            Then remove the top card from the deck

            and place card in player's hand.

      Else,

            Ignore.

When Left_Released is used on discard_pile card:

      If the player's turn and a card has not been picked,

            Then remove the top card from the discard_pile

            and place card in player's hand.

            Display the card that was "under" the top card.

      Else,

            Ignore.

Level: Start Screen

room_start_screen

Level: Main Level

room_main_level

Level: End Screen

room_end_screen

→ Mouse input

→ Game Over

When Left_Released is used on a player's card:

    If the player's turn and a card has not been discarded,

        Then move the card to the discard pile

        If this was not the card just picked up

            Move the picked up card to this position.

        Perform End of Turn.

    Else,

        Ignore.

When Left_Released is used on knock button:

    Set the knock variable to true

    Set the who_knocked variable to "player"

    Display "Knocked" message

When End of Turn:

    Score hand.

    If hand's total = 31

        Perform Lay Down.

    Else if knock has occurred and final turn has been taken

        Perform Lay Down.

    Else,

        Set turn to other player

        Update UI with turn arrow.

When Computer's Turn:

    Score hand.

    If hand > 26

        Knock

    Else if discard_pile card improves hand

        Move to computer's hand and discard appropriate card.

        Perform end of turn.

    Else

        Move deck_pile card to computer's hand

        Discard appropriate card

        Perform end of turn.

When time to Lay Down:

       Turn over computer's cards

       Score both hands

       Update UI

       If player's score > computer's score

              Remove computer token

       Else if computer's score > player's score

              Remove player token

       If time for last chance token

              Display it

       Else if game lost

              Go to end screen and end game.

End Screen

If the "Play Again" button is clicked,

       Then move on to the Main Level.

If the exit is clicked,

       Then quit the game.

Else,

       Keep displaying the End Screen.

Room Information:

	Start Screen	Main Level	End Screen
Room Name	room_start_screen	room_main_level	room_end_screen
Resolution	1024 x 768	1024 x 768	1024 x 768
Background(s)	back_start_screen	back_main_level	back_end_screen
Goals	❖ Introduce the player to mouse control. ❖ Click the play button to start the game.	❖ All playable content is contained in this level. ❖ Beat the computer.	❖ Allow the player to see who won. ❖ Click either the play again button or the quit button.

Assets:

Sprite Name	File Name
spr_cards_hearts	cards.png
spr_cards_diamonds	cards.png
spr_cards_spades	cards.png
spr_cards_clubs	cards.png
spr_card_back	cards.png
spr_token_game	game_token.png
spr_token_last_chance	last_chance.png
spr_title	title.png
spr_play	play.png
spr_knock	knock.png
spr_quit	quit.png
spr_knocked	knocked.png
spr_your_turn	your_turn.png

Background Name	File Name
back_start_screen	start_screen.jpg
back_main_level	main_screen.jpg
back_main_layout	main_reference.jpg
back_end_screen	end_screen.jpg

Object Behaviors:

Object	Behavior
card	Holds a playing card.
deck_pile	Represents the deck in the playing area.
discard_pile	Represents the discard pile in the playing area.
title	A UI piece that displays the name of the game
play_button	Advance from the room_start_screen or room_end_screen to the room_main_level and begin play.
knock_button	Signal to the other player that you have knocked.
quit_button	From either the room_main_level or the room_end_screen exit the game.
player_card1 player_card2 player_card3 player_card4	Placeholder for one of the cards in the player's hand.
opponent_card1 opponent _card2 opponent _card3 opponent _card4	Placeholder for one of the cards in the computer's hand.