

CpE 301L TAPJack

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Overview

- Background
- Group Roles
- Block Diagram
- Component Breakdown
- Demonstration
- Problems Encountered
- Future Steps



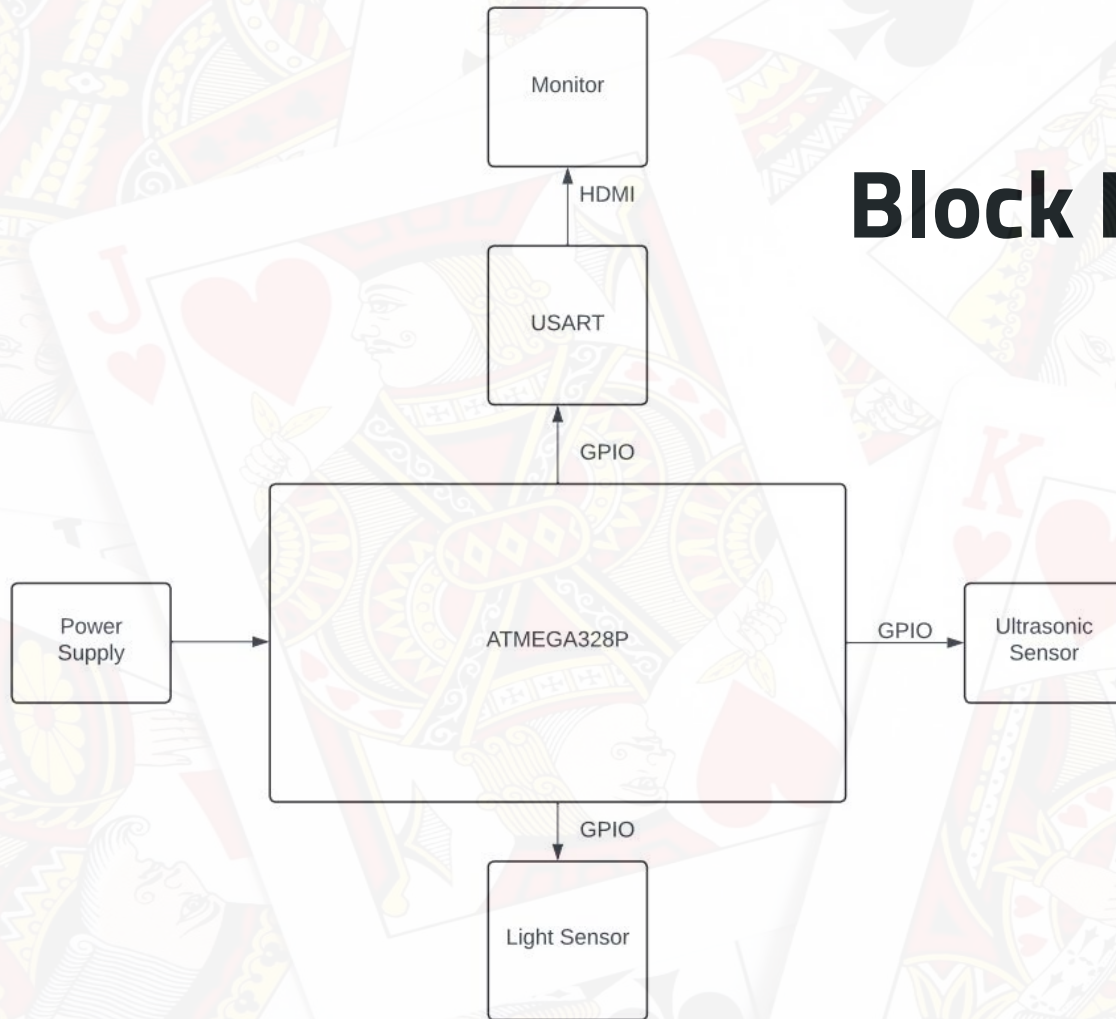
Background

- Description
 - Blackjack game
 - Object recognition
 - ASCII USART animation
 - Light Detection
- Function
 - Gaming, Automation, Spatial-Awareness Systems
- Components
 - Atmega328P
 - HC-SR04 Ultrasonic Sensor
 - USART via RS232 and MAX232N Chip
 - Monitor
 - TEMENT6000 Ambient Light Sensor
- Inputs/Outputs
 - Reset, Ultrasonic Sensor/USART

Group Roles

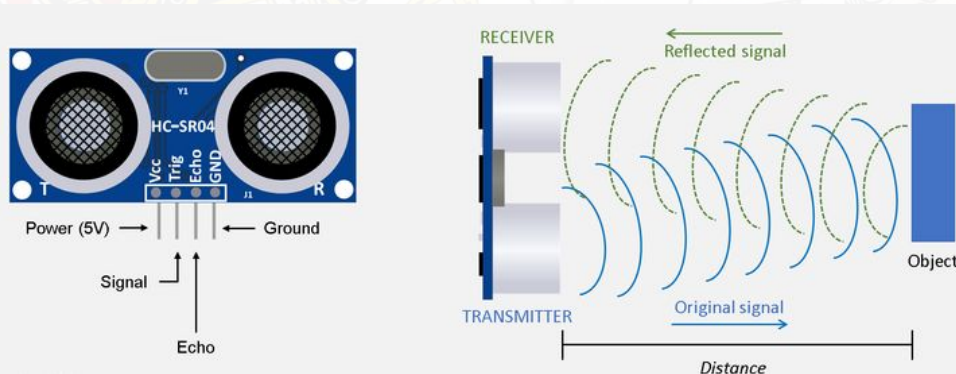
- Nathaniel Ramos
 - Blackjack Algorithm Designer
 - Light Sensor Engineer Lead
- Kevin Lei
 - Iterative USART Rendering Designer
 - Game Board/Schematic Engineer
- Quinn Frady
 - Ultrasonic Setup Design Lead
 - Game Board/Schematic Engineer

Block Diagram



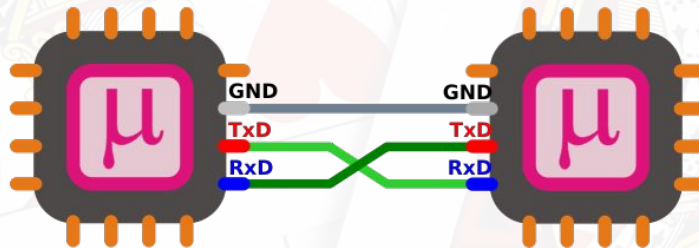
HCSR04 Ultrasonic Sensor

- Algorithm
 - Send ultrasonic pulse
 - Receives the reflection
- Measure time between pulse
- Calculate Distance



MAX232N USART

- Algorithm
 - Configure USART
 - Transmit via Transmit Buffer
 - Adjust according to Game Flow

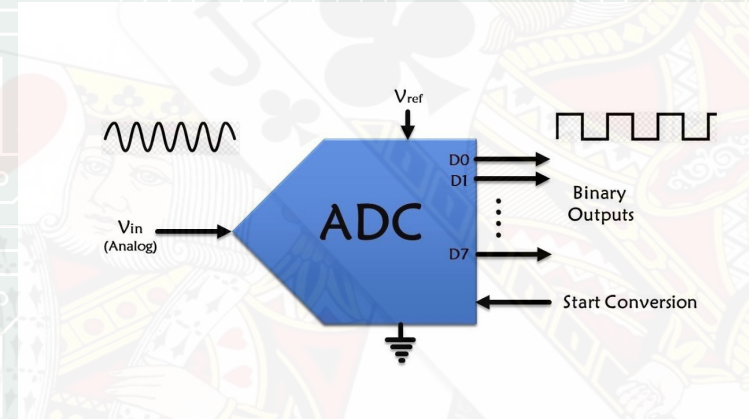




In Pursuit of True Randomness...



- Issues w/Seeding from Randnum
- Open pin reading via ADC
- Shift to Lavarand design
- Consideration of using a combination



Light Sensor



LIGHT SENSOR

- Algorithm
 - Sense luminance from surrounding environment
 - Send analog value to ADC
 - ADC converts analog value to digital value
 - Use digital value to seed RNG

Game Algorithm

- Algorithm
 - New Round
 - Deals Cards
 - Player Turns
 - Hit, Stay, Split
 - Dealer's Turn
 - Results
 - Repeat



Game Board Breakdown

The background is a solid teal color. It features a collage of playing cards, including the Jack of Hearts, King of Hearts, and Queen of Hearts, which are slightly tilted and overlapping. There are also several semi-transparent geometric shapes: a large circle with a diagonal line through it, and several smaller circles and rectangles in various shades of teal and white.

Demonstration

The background is a solid teal color. It features a collage of playing cards, including the Jack of Hearts, King of Hearts, and Queen of Hearts, which are slightly tilted and overlapping. In the upper right, there is a large, semi-transparent circular graphic with a smaller circle inside it. Along the right edge, there are several smaller, semi-transparent circles and a vertical bar composed of five rounded rectangular segments of varying heights.

Problems Encountered

- Accurately Reading Distance
- Design of the Board
 - Mounting the Sensor
 - Poor Arts & Crafts Skills
- Designing a Random Number Generator
 - Staying fair for the game
- Optimizing UI Refresh



Future Steps

- Player Selection
- Double Down
- Balance Counter
- Polish of the Ultrasonic Sensor
- VGA Implementation
- Refined RNG

Summary

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The background is a solid teal color. It features a collage of playing cards, including the Jack of Hearts, King of Hearts, and Queen of Hearts, which are slightly tilted and overlapping. There are also several semi-transparent geometric shapes: a large circle on the right side, a smaller circle below it, and a bar chart with five bars of increasing height in the bottom right corner. The overall aesthetic is modern and abstract.

QUESTIONS?

Thank you for tuning in to our
presentation...

