



# Computer Science Education Game

Capstone Project Report

**Team GJC** 

May 12, 2023

Christina Kong (ctk2@hood.edu)

Grayson Swift (gls15@hood.edu)

Jaken Whipp (jaw32@hood.edu)





# 01 The Project

Description and Objectives

# 02 Background/Project Plan

Prior Work and Solutions

# 03 Technical Description

Data Flow Diagram and Tech Stack

# 04 Accomplished Work

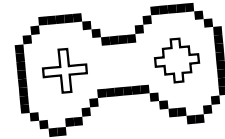
Description of Game's Features

# 05 Show-Overview

Game in-action

# Project Description

- Open-World and Visual Novel Game
- Computer Science Instructor
- NPC interactions directing users to answer CS questions
- Solving and Creating Nonogram Logic Puzzles

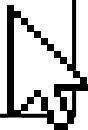




# Objectives



Encourage Computer  
Science Education



Resource for Studying  
Computer Science



Provides Challenging  
Quizzes on CS  
Knowledge



Provides Mentally  
Stimulating Logic  
Puzzles



# Background and Project Plan

## Previous MERN Projects

- Video Game Information App
- Todo List App

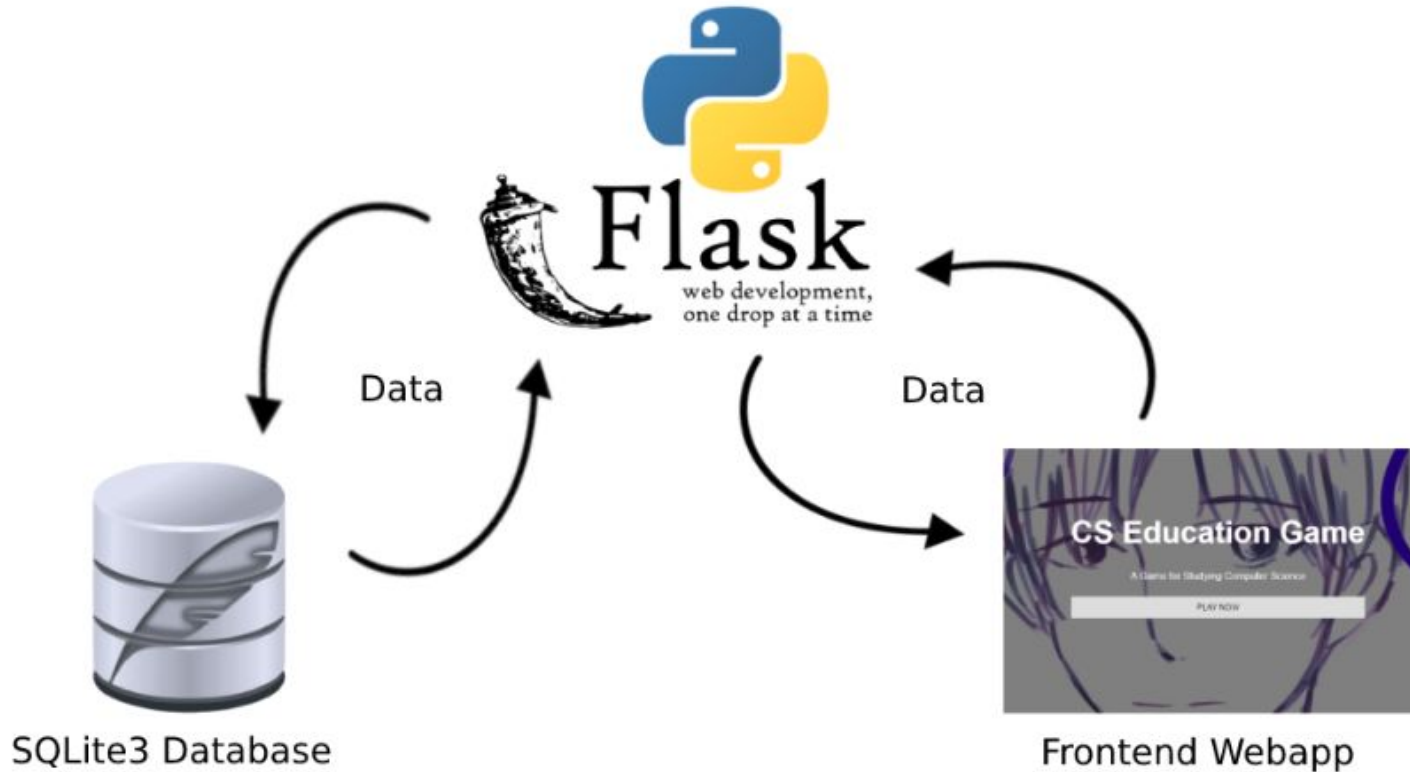
## Prior Flask Project

- Photo Management App

1. Provided prior knowledge with languages
2. Construct similarly to previous Flask projects but  
integrate JavaScript elements



# Data Flow Diagram





# Technical Description

## Development Stack

- Backend
  - Python, Flask, SQLite3
- Frontend
  - HTML, CSS, JavaScript

## Platforms/Tools

- Spyder (Python IDE)
- Visual Studio Code
- Tiled





# Features

- Authentication
- Open-world Environment with Several Locations
- Player Movement through Environment
- NPC Interactions with Dialogue
- Visual Novel Interface for Question Functionality
- Puzzle Library, Playability, Creation
- Question Creation





# Overview

Hello, world!



## FAST TRAVEL

Office    Hallway

Classroom    Schoolyard

## CONTROLS

W = UP  
A = LEFT  
S = DOWN  
D = RIGHT

## STUDENTS

1 2  
3 4



Which deadlock condition is described by a resource which is assigned to exactly one process?

Hold-and-Wait

No-preemption

Circular Wait

Mutual Exclusion



# Overview

## Nonogram Puzzle

Congrats! You Won with No Mistakes! :D

Instructions

	5	4	6	3	7	2	1	2	7	2	7	2	1	2	7	2	6	3	5	4
10																				
3 2 3																				
3 2 3																				
3 2 3																				
3 2 3																				
8																				
1 6 1																				
2 2																				
10																				
10																				

Restart

Instructions

	5	4	6	3	7	2	1	2	7	2	7	2	1	2	7	2	6	3	5	4
10																				
3 2 3																				
3 2 3																				
3 2 3																				
3 2 3																				
3 2 3																				
8																				
1 6 1																				
2 2																				
10																				
10																				

Restart



# Lessons Learned

- Plan prior to Coding
  - Canvas fueled mid-development swap from Python, Flask, SQLite3 to MERN and then back again
- Comments are Key
  - Without comments, it is difficult to understand someone else's code
- Backup Work Regularly
  - Minimizes code loss when working
  - Upload to GitHub or make local copies





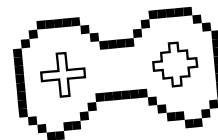
# Future Work

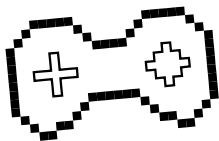
- Uploading Questions to the Database by CSV file
- Map Traversal using doors and Map Collisions within Canvas
- Changing Sprite Image based on Directional Movement



# DEMO

Demonstration of Computer Science Education  
Game





# Thank You!



CREDITS: This presentation template was created by  
**Slidesgo**, and includes icons by **Flaticon**, and infographics  
& images by **Freepik**