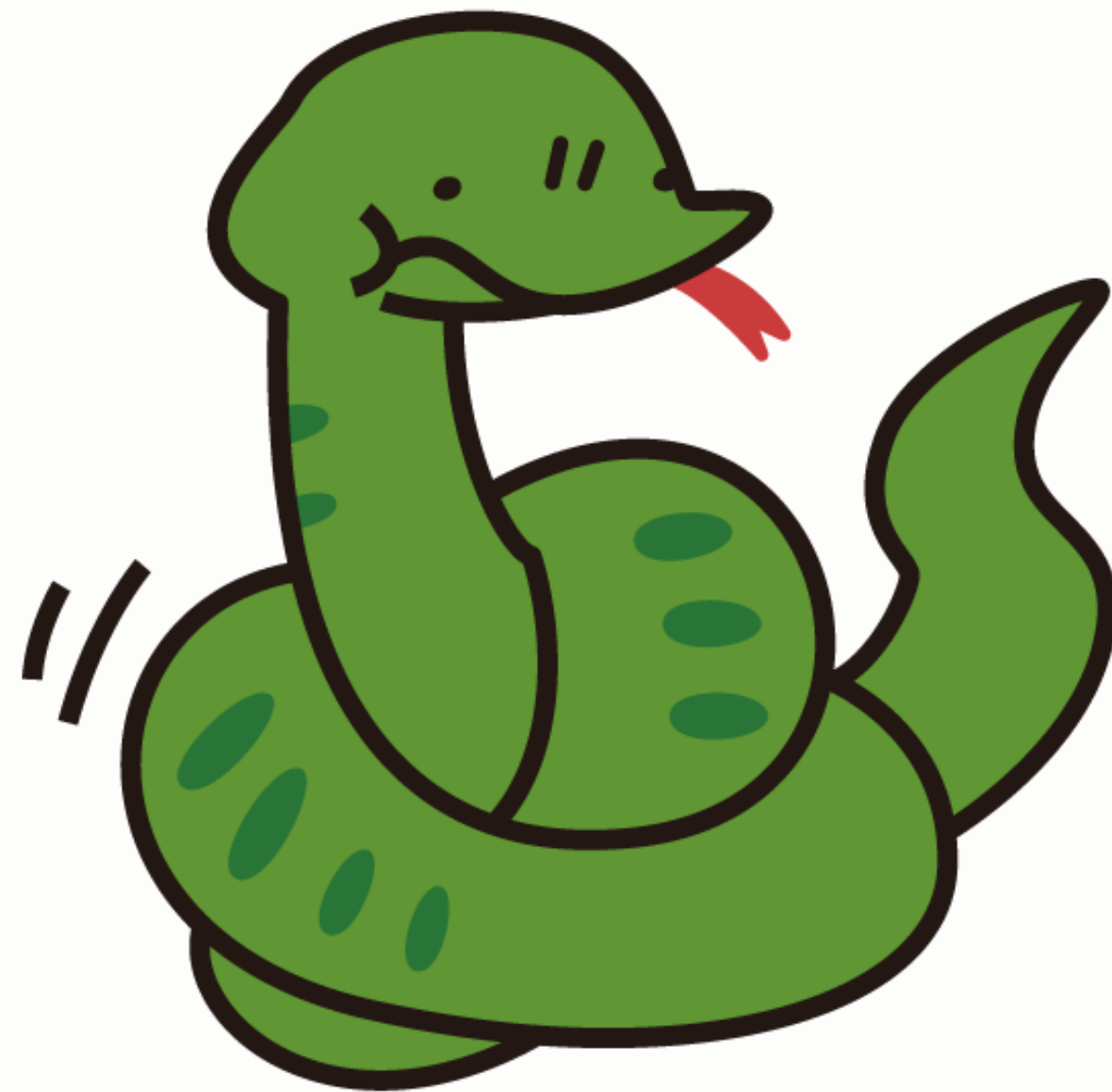**DM2008 MID-TERM PROJECT PRESENTATION**
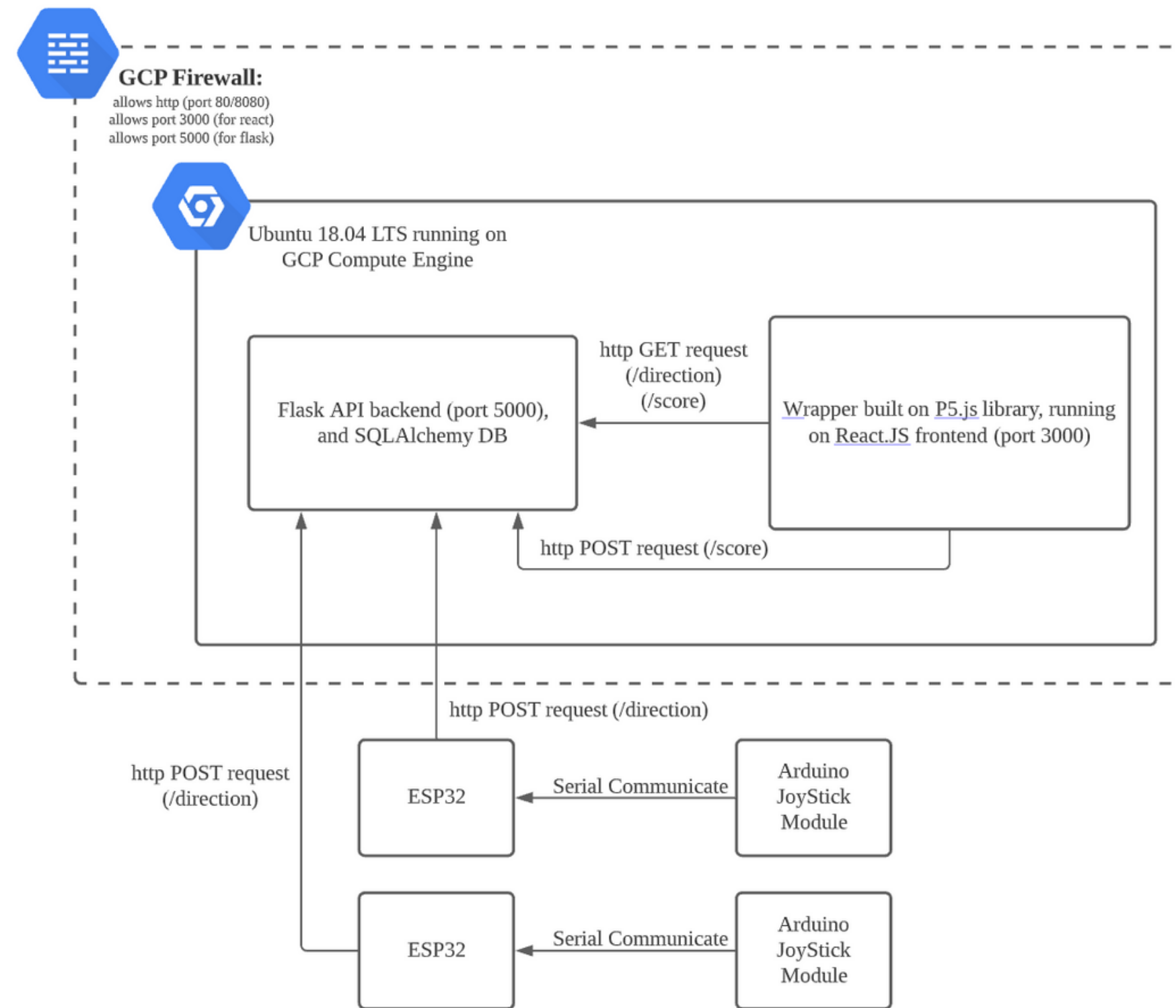
# SNAKE GAME

- WONG KANG HONG

# Concept :

PROPOSED, IS AN IT INFRASTRUCTURE AND MVP OF A PRODUCT THAT EMPLOYS AND BUILDS-ON FROM THE SOFTWARES THAT WERE TAUGHT IN THIS CLASS.

GIVING A PHYSICAL KEY TO SELECTED USERS, THEY CAN PLAY AND COMPETE ON AN ONLINE SNAKE GAME THAT CAN BE ACCESSED ANYWHERE AND ANYTIME AROUND THE WORLD.

# HIGH-LEVEL ARCHITECTURE

# Why I chose to use these Technologies

## Python -> Flask API Backend

BUILDING ON PYTHON, I CHOSE TO USE FLASK API SERVER AS MY BACKEND. INTEGRATED WITH A SQLALCHEMY DB, THIS SERVER HOSTS 1 DB CONTAINING 2 TABLES, ONE FOR THE DIRECTION AND ANOTHER FOR THE SCORES. WHEN INTERACTING WITH THESE DATABASES, WE EMPLOY BASIC DATA STRUCTURE AND ALGORITHMIC LOGIC SUCH AS POP AND PUSH WHICH WERE COVERED IN CLASS.

## Processing -> p5 Wrapper on React.JS Frontend

BUILDING ON PROCESSING, I CHOSE TO USE P5 LIBRARY (JAVASCRIPT VARIANT) TO BUILD A REACT.JS WRAPPER SO AS TO RENDER A FRONTEND THAT BEST SIMULATES A LOCAL PROCESSING ENVIRONMENT, ALLOWING SIMPLE TRANSLATION FROM PROCESSING CODE TO THE REACT.JS FRONTEND. MULTIPLEXED AND ROUTED ON THE SUB-DIRECTORY LEVEL, UI ALSO EMPLOYS HTML AND CSS (APART FROM JAVASCRIPT).

## Arduino Uno -> ESP32

BUILDING ON ARDUINO, I CHOSE TO USE THE ESP32 BOARD AS THE CHOICE FOR MY MICRO-CONTROLLER DUE TO ITS IN-BUILT WIFI CAPABILITIES. A JOYSTICK MODULE PUMPS ANALOG VALUES TO THE ESP32 (VIA SERIAL COMMUNICATION), FOLLOWED BY THE ESP32 CLEANING AND PUMPING DATA TO THE CLOUD SERVER (VIA HTTP PROTOCOL OVER WIFI COMMINCATION).

## Google Cloud Platform

RUNNING ON GOOGLE CLOUD'S DEDICATED COMPUTE SERVERS (ON UBUNTU INSTANCES), USERS ARE ABLE TO ACCESS THE GAME ANYWHERE AND ANYTIME ACROSS ALL DEVICES AROUND THE WORLD. CONFIGURED TO BE SUBJECTED TO FIREWALL RULES, THE IT INFRASTRUCTURE IS SECURED VIA SELECTED RULES (ON PORTS) AND ACCESSISIBLE.
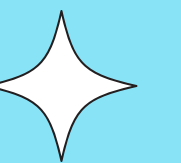
# Demo

# DEMO (VIDEO) [OVERTAKING HIGHSCORE]

<ORIGINAL VIDEO DELETED>

# Here's a Recap:
## (Not just a Snake Game, but an Infrastructure)

PHYSICAL DEVICES ARE GIVEN TO EXCLUSIVE PLAYERS, TAGGED WITH THEIR NAME(ID). ONLY THESE PLAYERS HAVE ACCESS TO START THE GAME VIA THE BUTTON ON THEIR DEVICES.

WHEN A NEW HIGH SCORE IS ACHIEVED, THE HIGH SCORE IS AUTOMATICALLY UPDATED AND REFLECTED IN THE UI.

PLAYERS COMPETE TO GET THE HIGHEST SCORE!

# WHAT CAN BE IMPROVED IF GIVEN MORE TIME, AND HOW I WOULD GO ABOUT DOING THEM

- ✦ **DNS RESOLUSION AND MASKING**

- ✦ **USE SSL CERTIFICATES (HTTP(S) INTEGRATION)**

- ✦ **INTRODUCE MULTI-PLAYER VIA STATES**

# THANK YOU!

Q&A, easy questions please <3