DFD Specification

bigBang

A Gobang game with "big" features

Group D3
LI Heming, 1155157266
NING Chenyu, 1155157065
LI Houting, 1155157187
POON Yong Xian, 1155157534

Content

I. HIGH-LEVEL CONTEXT DIAGRAM

I.I Description

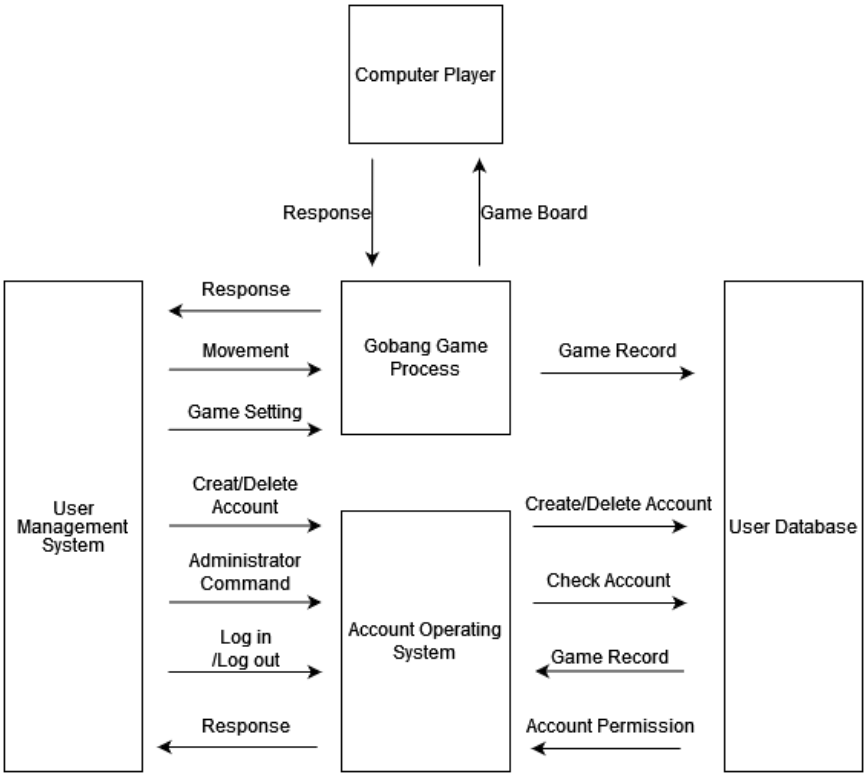
There are five parts: user management system, computer player, gobang game procedure, account operating system, and user database.

The user management system is the user interface, which users can only access. Users can input game settings, movements, account information, etc. The account operating system will deal with any input about accounts. After users start games, their input will be transferred into the gobang game procedure.

The process will check the command in the account operating system. If it is login, the system will send the user account and password into the user database to check whether it is correct and whether it is an administrator account. The operating system will return them to users. If a user wants to create/delete/list account(s), the operating system will check the user's permission and ask the database for this information.

The computer player and gobang game procedure parts will respond to user input, such as setting rules, making movements, and withdrawing action. After the game ends, the game record will be saved in the user database.

I.II High-level Context Diagram



II. FEATURE DIAGRAMS

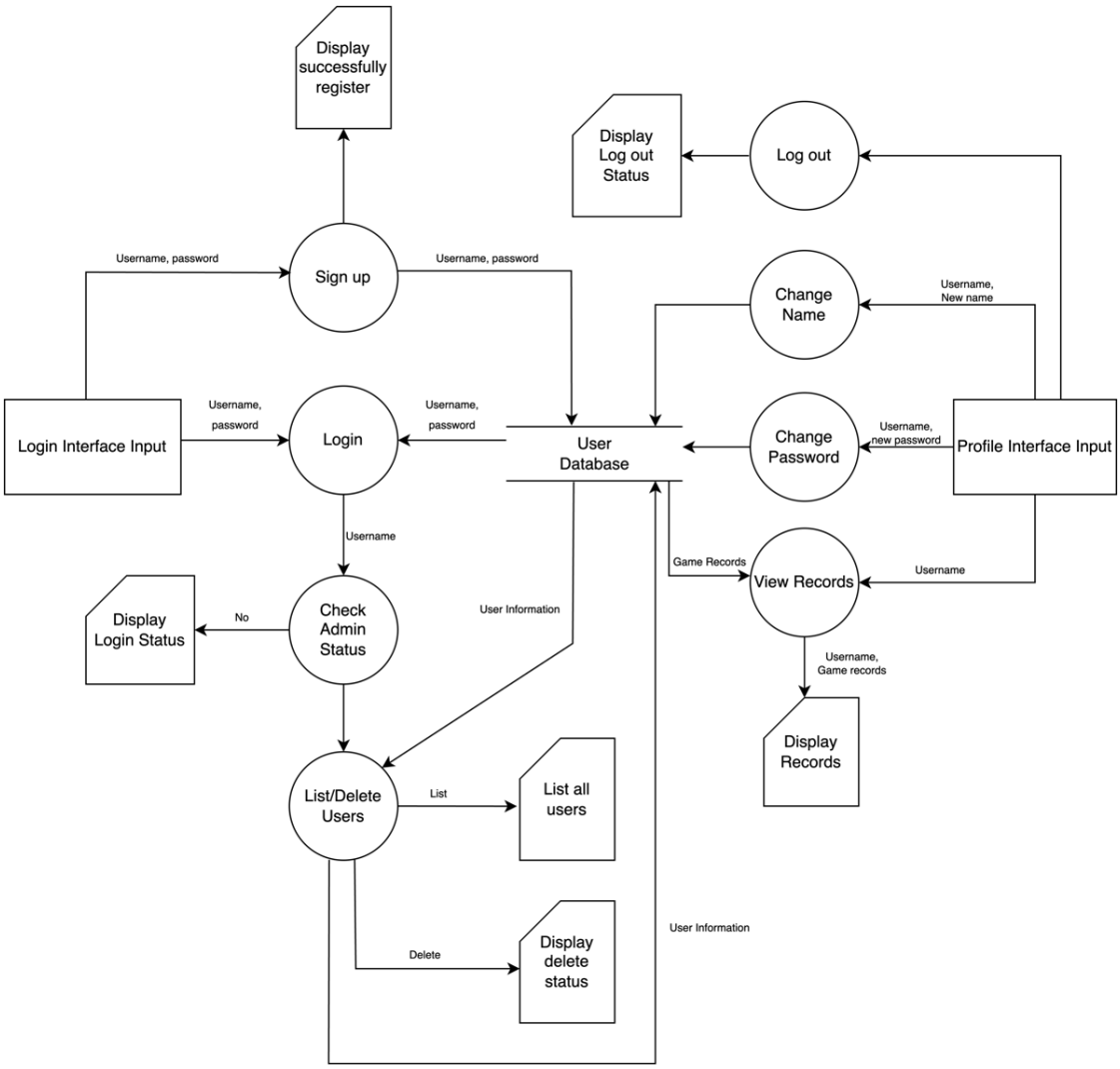
II.I User Management

II.I.I Description

The user management system provides an easy and secure way to manage user information in bigBang. It enables new users to register their account by simply entering username and password, which ensures the uniqueness of each user. For existing users, they can login with their username and password.

Once successfully logged in, user will be navigated to a new page, allowing them to view game records, changing username and password, as well as log out. Besides, an admin user enjoys more privilege, such as listing all existing users and deleting users.

II.I.II Data Flow Diagram



<u>Sign Up</u>

After the game is opened, the user will see the Login page. If user does not have an account at that moment, a new one can be created by using the sign-up function. After selecting “Sign up”, the user will be asked to enter an account name and password, which cannot be duplicated by other users. And data will be stored in the database.

Login/Logout

If the user already has an account, he can enter the account and password on the login page. If user successfully entered the account, he will be taken to a new page. It shows game history, enter the game and log out of his account. If there is wrong entered, a warning will be prompted to the user and request him to enter it again.

Game Records

The game records function will show the games played by the account, including start time, elapsed time, player names, winner, and final Goboard with stones. The user can view game records after successfully logging in.

Change name/password

Once logging in to the profile page, users can change their usernames and passwords. They are required to provide their new password/ username.

List/Delete Users (for Admin only)

After successfully verifying that the account is the administrator, he can use the “List/Delete users” function. "List users" list all usernames of the game and "Delete
users" allows the administrator to delete user accounts with a specific account name.

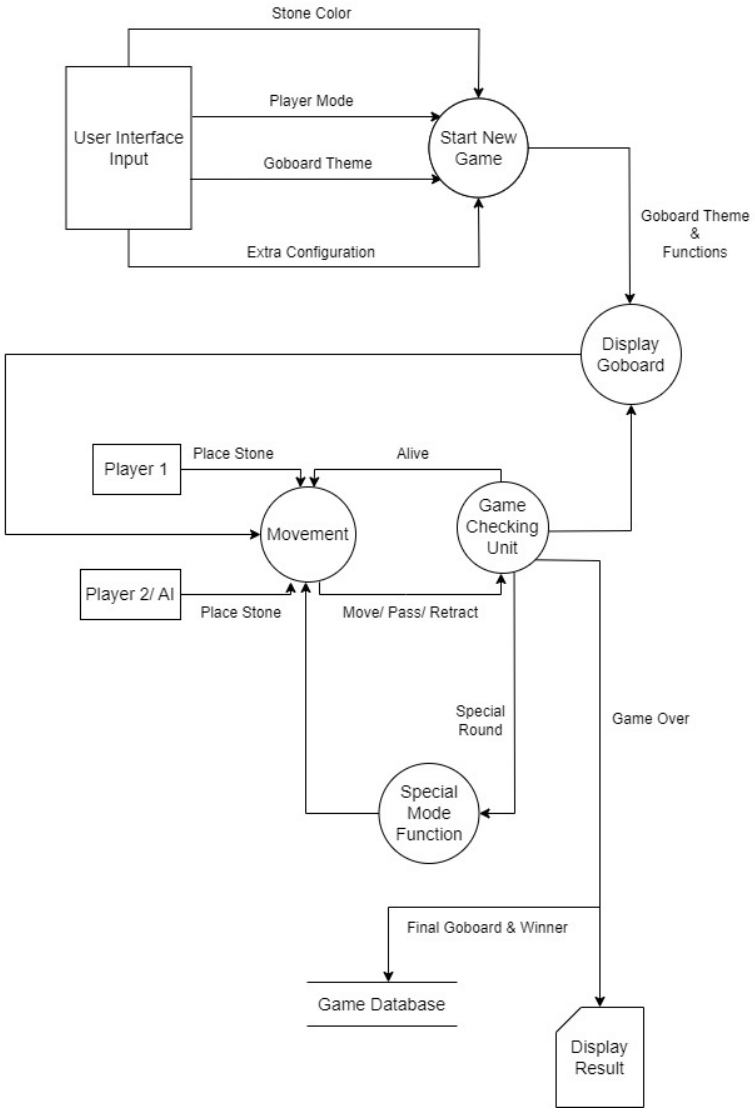
II.II Game Control

II.I.I Description

The goal of game control is to develop basic rules and regulations that regulate how games are structured. This can certainly provide an enjoyable gaming environment for the player. To begin a new game, user interface inputs such as stone, player mode, Goboard board theme, and extra configuration are required. A Goboard will be displayed according to user inputs. Human and AI players will make movements based on the current Goboard display. Before a movement is committed, it will be checked by the Game Checking unit to make sure the movement is legal and determine whether the game is over. If the user enables extra configuration, such as “Three-step Exchange” before the game, Special Mode Function will be evoked to check the movement fits the extra configuration. If a movement is legal, then it will be displayed on the goboard. If the game is still alive after the movement is committed, the two players will continue the game until one of them wins the game. If the game is over after the movement, the result of the game will be

outputted, and the information of the game will be stored in the game database.

II.I.II Data Flow Diagram



Start New Game

Player needs to choose two modes: “player vs. player” or “player vs. computer”. If player choose to play with computer, it allows player to set the computer difficulties. Board theme and stone color also need to be selected. Players are allowed to multi-select “Early Termination”, “Three-step Exchange”, “Five-step Three Strikes”, and “Timer” in order to add extra configuration.

Display Goboard

This function receives starting data to initialize the displayed game board, which includes current player, all player names, stone type, start time, elapsed time, respective board theme, and timer

for the extra configuration.

Movement

Players can choose to move, pass, or retract in this function. If players add some extra configurations in the initialize stage, special functions will be added in the special round of the game. For “Three-step Exchange”, second-hand player can choose to exchange the color exactly after the third move. For “Five-step Three Strikes”, first-hand player needs to provide three positions for the fifth move, and let the second-hand player choose exactly one place as the first-hand player's movement.

Game Checking Unit

This function will run when the player makes a movement. It examines each movement to determine its validity and gaming status. If the movement made by the player is not validated, the player needs to restart the movement. If there is a draw or a winner, the game will display the result and save the gaming data. Otherwise, it will continue to run the game and request players to place their stones.

Game Database

Once the game is over, game data including final goboard and winner will be uploaded to the storage, i.e., game database. The information stored in the game database is prepared for "View Record" function in the User management section.

Display Result

Once the game is over, the final goboard and winner will be displayed on the client's screen. In addition, buttons to "Main Menu" and "Quit" will also be displayed.