King's Gambit Chess V2 User Manual

KGChess V2

Team 20:
King’s Gambit

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Glossary

Term	Definition
Access Control List (ACL)	Applies rules to switch ports or (Internet Protocol) IP addresses available to a host or switch.
ASCII (American Standard Code for Information Interchange)	A character encoding standard for electronic communication. ASCII codes represent text in computers, telecommunications equipment, and other devices.
Bandwidth	the channel occupied by the carrier and measured as the difference in hertz (Hz) between the highest and lowest frequencies in the channel.
Client/server architecture	When servers provide one or more possible resources to less powerful systems, known as clients, upon request.
Cryptography	The practice and study of techniques for secure communication in the presence of third parties called adversaries.
Data	Any form of information that is used as input to a system or application for processing or that is produced as the output from a system or application.
Encryption	The act of altering data to make it unreadable by any person or device, except by the intended recipient,
GUI (Graphical User Interface)	A computing user interface (UI) characterized by a full-screen work area and icons that represent objects such as folders and files.
Host	A networked device with an IP address; a mainframe computer system; the operating system on which a hypervisor runs.
IPv4	The primary Layer-3 protocol in use on the internet and private intranets. Provides end-to-end logical identifiers—32-bit IPv4 addresses.
IP Address	A numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication.
LAN (Local Area Network)	A network consisting of all devices behind and including a single router interface
TCP	Connection-oriented protocol that is used on top of IP to ensure reliable transmission of packets
UDP	Connectionless protocol with no overhead for opening, maintaining, or terminating a connection

1. Installation

1.1 System Requirements

- Recommended OS: Linux (CentOS release 6.10, Kernel: 2.6.32-754)
- Memory: At least 512MB RAM
- Game Storage: 1.03 Megabytes

1.2 Setup and Configuration

- **Clone files from GitHub**
  git clone https://UCINETID@github.uci.edu/EECS-22L-S-21-Team-Projects/Team20.git
- **Get tar.gz archive**
  cp ~Team20/bin/KGChess.tar.gz
- **Extract tar.gz package**
  gtar xvzf bin/KGChess.tar.gz
- **Change current directory to KGChess**
  cd KGChess
- **Compile and generate executable**
  make all
- **Run client**
  bin/KGChess HOSTNAME PORT
- **Run server**
  bin/Server PORT

1.3 Uninstalling

- **Remove executable and object files**
  make clean
- **Remove all files (includes .c and .h files)**
  make cleanall

2. Chess V2 - Client

2.1 Overview of Features

- Multiplayer across EECS Linux Server
  - Two users are able to connect to a server hosting a live chess game where they will be able to input their moves/commands respectively.
- Account registration
  - Ability to create an account with a username and password as well as the IP address and Port number.
- Connect to live chess game against another player
  - Users are able to chat live using “chat [message]” and play against each other.
- In Game Chat
  - Users can send messages as well as react to other users’ messages.
  - Users will be able to type in-game text to each other while playing chess.
  - Each user can talk to each of the other users one-by-one at the same time.
- Spectate Match
  - Users will be able to watch a game of chess between two other users as a spectator.

2.2 Logging in/Registering

- **Online Multiplayer**
  - In the Original Main Menu, there will be a new option to select online multiplayer that will take you to the log in, register menu.

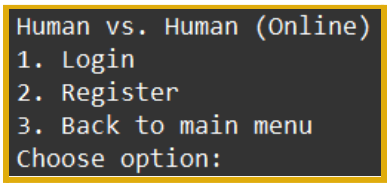

Figure 1: Logging in/Registering

- **Log in**
  - Users will be able log in by selecting the “Login” option via input “1”. From there a new menu will be displayed and users will be able to input a char[65] log in name and password and the input will be compared to existing databases acquired from Register.

```
Login
Username: testusername
Password: testpassword
```

Figure 2: Requesting account information for logging in

- **Register**
  - Register will work after selecting the “Register” option using input “2”. From there the user will be prompted to add a username and password of char[65].
  - The user account with the password will be transmitted to, check with.
  - The inputs will be stored in a new database/query.

```
Register
Username: testusername
Password: testpassword
```

Figure 3: Requesting account information for registering

- **User already exists**
  - Username input will be compared to the existing database and if the string matches that of the existing database it will print an error message “ User already exists” and it will prompt the user to try a new user name.

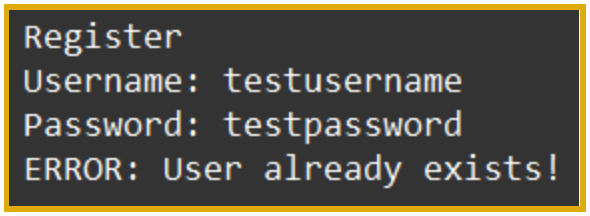

Figure 4: User already exists error

2.3 Getting Started

- **Main Menu**
  - Main Menu will have an additional option of online multiplayer.

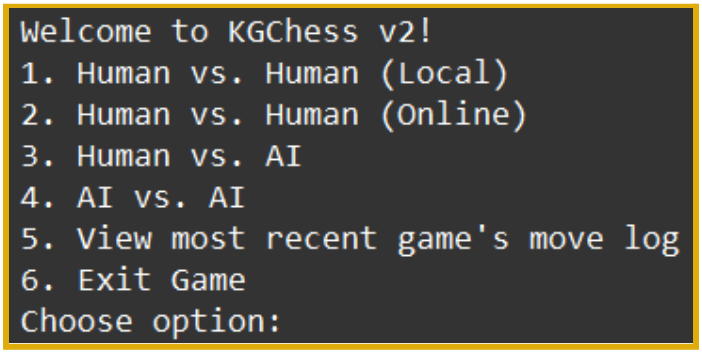

Figure 5: Main menu prompt

- **Starting a game**
  - Users will type in the online multiplayer option and will be able to find a game.
- **Finding a game**
  - When a user inputs online multiplayer, user will be on standby until a match is found with another opponent
- **Protocol messages to forward to server**
  - `login [username] [password]` - Logins to an existing account with a username and password
  - `register [username] [password]` - Registers a new account in the database with a username and password
  - `side [color]` - Designates current client to specified color and sets the other client to the opposite color
  - `chat [message]` - Sends a message to the server which will pass the message over to the other client

- move [move input] - Will check if the move input is valid and updates the board locally before sending to the server to update the other client's board
- takeback - Undo the latest move of both clients
- quit - Exits the client
- shutdown - Exits the client and shuts down the server

2.4 Usage Scenario

- **Scenario**
  - User boots up the computer and opens the game to start.
  - User assumes a Game Player Role and is assigned to black or white.
  - User selects Online Multiplayer and can view game status including check game status
  - Users are prompted to sign in and/or Register by selecting 1 for log and 2 for register.
  - Once logged in Player will be put in a lobby and wait for the opponent to join.
  - User will be able to select what color they want and incoming player will get the other
  - Once two users join, a match will begin.
  - User "Makes Moves" such as placing a symbol on an open square on the Game Board.
  - User "Makes Move" and places a symbol on an occupied square on the Game Board. Results in the Original symbol continue to occupy the square but allow the Game Player to select another square.
  - User uses symbols representing chest pieces to take opponents chest pieces by selecting them according to rules of chess.
  - Users goal is checkmate and whichever player gets checkmate first receives a victory and game ends
  - Asking user whether they want to save the game log or not

- The user will be able to stay in the lobby or leave, if they select leave then the other user can still stay in the lobby.
- Returns to main menu after game ends

3. Chess V2 - Server

3.1 Overview of Features

- **Host live chess game**
- **Listens for the queries from the clients**
- **Send back the response to client requests**
- **Stores the information about all the users in the network including:**
  - Account name
  - Account password
  - Login details
  - IP address
  - Port Number

3.2 Usage Scenario

- **Usage Scenario**
  - User inputs “./KGServer -[Port #]”
  - When finished user inputs “dc” to disconnect from the server or “shutdown” to disconnect from the server and shutdown the server
  - User is successfully connected to the network and can now join que, spectate, or play an online match by selecting S for spectate or P which may ask to join a que and the user will select Yes or no.
  - Change user status to either online or offline automatically or users can manually set themselves to offline for privacy.

3.3 Logging in/Registering

- **Registering**

    - Users will register by creating an account by selecting “2’ for register. From there User will input a username and password and then the information will be saved. If the account already exists then the user will be informed to log in instead.
- **Log in**
    - User will select option “1” to log in, user will put in their username and password and if it is correct it will log in, else user will be told to try again if it is incorrect.

3.4 Chess Game Integration

- The gameplay of our chess program will be similar to the original program which we already implemented. In addition, we will be including server-client functionality by integrating our chess program into an online server where players can play against each other in a nonlocal environment.
- The server will handle sending and receiving data from each user’s client
    - Client allows the user to input commands (perform move, takeback, save move log, exit, etc…)
    - Server will receive a command from one client, update the board, and send the updated board to both clients.
- An example is the new added feature of a chat box in tandem with the ongoing chess game. The chat box will update every time a client sends a personal message during the game.

- The chess board will be updated live on the server every time a player makes a move. Each player can see move changes live.
- Implementation of a queue system will allow players to log in and wait in queue to play a specific user.
- Implementation of a spectator mode will allow a third party participant to have the luxury of spectating a chess match between two other players.

4. Back Matter

4.1 Copyright

4.2 Error Messages

Error codes:

Error #	Problem	Solution
-1	Connection Error	Make sure you are connected to the internet.
0	Program successfully launches and exits upon completion	N/A
1	Invalid port	Enter the proper port
2	Invalid IP	Recheck IP address and input again

3	Incorrect Username or Password	Make sure that the spelling is correct since it is case sensitive and re input
4	Users already exist!	Either use the Log in instead or create a different account that doesn't already exist.

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