CMPT 371: Deny & Conquer - Final Project Report

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Group 27

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1. Description of the Game and Design

- Game Summary:
  - Deny & Conquer is a real-time multiplayer game where players compete to claim squares on a shared 8x8 grid. Each square must be scribbled (with the mouse) by the player and successfully filled in before others do. The player with the most squares wins.

- Design Highlights:
  - Built using Python with pygame for client-side UI and socket for networking.
  - Modular architecture for scalability and maintainability.
  - Supports up to 4 simultaneous players.
  - Client and server communicate through a custom application-layer messaging protocol.

- Application-Layer Messaging Scheme:
  - Application-Layer Messaging Scheme: Messages exchanged between client and server are encoded as plain-text strings, each ending with a newline (\n). The format follows:
    - COMMAND|data1|data2|...\n
- Example Messages:
  - CONNECT|Ansh — Sent by client to identify itself when joining.
  - WELCOME|1|#FF0000|8 — Sent by server assigning ID, color, and grid size to the new client.
  - LOCK_REQUEST|3|4 — Sent by client to temporarily lock square (3,4) while scribbling.
  - CLAIM_ATTEMPT|3|4 — Sent by client to claim square (3,4) if sufficient coverage is reached.
  - UPDATE_BOARD|[[0,0,1,...]] — Server broadcasts board updates to all clients.

- ➢ UPDATE_SCORES|{1: 5, 2: 3} — Server sends latest player scores.
- ➢ GAME_OVER|Player A wins with 12 squares! — Server announces the end of the game.

❖ **Opening Sockets (Client Side)**

➢
```
self.sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
self.sock.connect((self.server_ip, port_num))
```

❖ **Handling the Shared Object (Board State)**

➢
```
elif command == "UPDATE_BOARD":
    self.board = ast.literal_eval(payload)
```

2. Group Members and Contribution Percentages

Name	Role	Contribution
CJ Rasos		%
Mehar Saini		%
Phillip Ho		%
Ansh Dhaliwal		%

3. Source Code Repository (Commented)

GitHub Repository: https://github.com/sijae24/CMPT371-Project

All source files are commented, including:

server_modules/: threaded server with board logic

4. Demo Video (2 Players, Shared Object in Action)

Link:

The demo video shows two players successfully connecting to the server, locking and claiming squares, and a final winner being determined.