**Name:** Shubham Jain

**BJF403:** BJF403

**S/N:** 11320746

**Architecture:** The Channel-Based Chat Tool is designed using the traditional three-tier architecture. The front-end display tier is built using React.js and includes various npm packages like axios, react icons, and react-router-dom. The application tier is built using Express.js and Node.js, which handles the server-side logic of the tool. The database tier is built using MySQL, which stores all the user and chat-related data.

**Database Design:** The database design for the Channel-Based Chat Tool includes several tables and relationships. The main tables include the User table, Channel table, Chat table, Reply table, and Follow table. The User table stores all the user-related information, including user ID, username, password, email, and profile picture. The Channel table stores all the channel-related information, including channel ID, channel name, and the user who created the channel. The Chat table stores all the chat-related information, including chat ID, chat message, the user who created the chat, and the channel to which the chat belongs. The Reply table stores all the reply-related information, including reply ID, reply message, the user who created the reply, and the chat to which the reply belongs. The Follow table stores all the follow-related information, including follow ID, the user who is following, and the user who is being followed.

**Design Decisions:** The database design includes several relationships between tables, such as the one-to-many relationship between the User and Channel tables, the one-to-many relationship between the User and Chat tables, the one-to-many relationship between the Chat and Reply tables, and the many-to-many relationship between the User and Follow tables. These relationships help to organize the data and make it easier to retrieve the required information. Additionally, the tool includes authentication using json web token to ensure that only authorized users can access the channels and chat features. The tool also includes a light/dark mode feature to enhance the user experience.

Overall, the Channel-Based Chat Tool architecture and database design are designed to provide a seamless user experience while ensuring data security and efficient data management.