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CLASS	622-A

- ➢ Full Stack PRACTICE 7.3
- CODE

  server.js :::

```
// realtime-chat-backend/server.js

const express = require('express');
const http = require('http');
const { Server } = require('socket.io');
const cors = require('cors');

const app = express();
// Enable CORS for Express (if needed for REST routes, but mainly for Socket.io)
app.use(cors({
    origin: "http://localhost:3000", // Allow connection from React app
    methods: ["GET", "POST"]
}));

// 1. Create an HTTP server instance using the Express app
const server = http.createServer(app);

// 2. Initialize Socket.io and attach it to the HTTP server
const io = new Server(server, {
    cors: {
        origin: "http://localhost:3000",
        methods: ["GET", "POST"]
```

```javascript
    }
});

const PORT = 5000;

// Store connections for logging (optional)
let userCount = 0;

// 3. Socket.io connection handler
io.on('connection', (socket) => {
    userCount++;
    console.log(`User connected: ${socket.id}. Total users: ${userCount}`);

    // --- Message Broadcasting Event ---
    // Listen for 'sendMessage' event from any client
    socket.on('sendMessage', (messageData) => {
        // Log the message on the server
        console.log(`New message from ${messageData.user}: ${messageData.text}`);

        // Broadcast the message to ALL connected clients (including the sender)
        io.emit('receiveMessage', messageData);
    });

    // --- Disconnect Event ---
    socket.on('disconnect', () => {
        userCount--;
        console.log(`User disconnected: ${socket.id}. Total users:
${userCount}`);
    });
});

// Start the server
server.listen(PORT, () => {
    console.log(`Socket.io server listening on http://localhost:${PORT}`);
});
```

App.js ::::

```javascript
// realtime-chat-frontend/src/App.js
import React, { useState, useEffect, useRef } from 'react';
import io from 'socket.io-client';
import './App.css'; // For basic styling
```

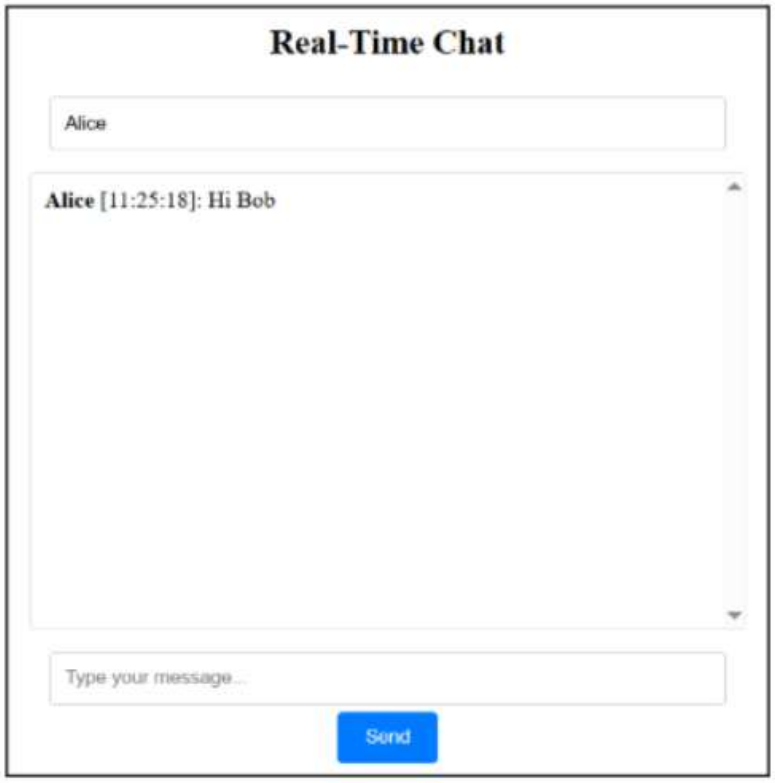
```javascript
// 1. Initialize the socket connection outside the component
// so it doesn't reconnect on every render (or use useMemo/useRef inside)
const SOCKET_SERVER_URL = 'http://localhost:5000';
const socket = io(SOCKET_SERVER_URL);

// Helper to format time
const getTime = () => {
    const now = new Date();
    return `${now.getHours().toString().padStart(2,
'0')}:${now.getMinutes().toString().padStart(2,
'0')}:${now.getSeconds().toString().padStart(2, '0')}`;
};

function App() {
    const [username, setUsername] = useState('');
    const [message, setMessage] = useState('');
    const [chatLog, setChatLog] = useState([]);

    // Ref for auto-scrolling the chat window
    const messagesEndRef = useRef(null);

    // Effect for connecting and listening to socket events
    useEffect(() => {
        // Auto-scroll whenever chatLog updates
        messagesEndRef.current?.scrollIntoView({ behavior: "smooth" });
    }, [chatLog]);

    useEffect(() => {
        console.log('Attempting to connect to socket...');

        // 2. Listen for 'receiveMessage' event from the server
        socket.on('receiveMessage', (data) => {
            // Add the new message to the chat log
            setChatLog((prevLog) => [...prevLog, data]);
        });

        // Clean up on component unmount
        return () => {
            socket.off('receiveMessage');
        };
    }, []); // Run only once on mount

    const sendMessage = (e) => {
        e.preventDefault();
        if (!username || !message) return;

        const messageData = {
            user: username,
            text: message,
            time: getTime(),
        };

        // 3. Emit the 'sendMessage' event to the server
        socket.emit('sendMessage', messageData);

        // Clear the input field
        setMessage('');
    };

    return (
        <div className="chat-container">
            <div className="chat-box">
                <h1 className="title">Real-Time Chat</h1>

                {/* Username Input */}
                <input
                    type="text"
                    placeholder="Enter your name (e.g., Alice)"
                    value={username}
                    onChange={(e) => setUsername(e.target.value)}
                    className="username-input"
                />

                {/* Chat Log Display */}
                <div className="message-list">
                    {chatLog.map((msg, index) => (
                        <div key={index} className="message-item">
                            <span className="user-time">
                                <strong>{msg.user} [{msg.time}]:</strong>
                            </span>
                            <span className="message-text"> {msg.text}</span>
                        </div>
                    ))}
                    <div ref={messagesEndRef} /> {/* For auto-scrolling */}
                </div>

                {/* Message Input and Send Button */}
                <form onSubmit={sendMessage} className="input-area">
```

```
                    <input
                        type="text"
                        placeholder="Type your message..."
                        value={message}
                        onChange={(e) => setMessage(e.target.value)}
                        disabled={!username}
                    />
                    <button type="submit" disabled={!username || !message}>
                        Send
                    </button>
                </form>
            </div>
        </div>
    );
}

export default App;
```

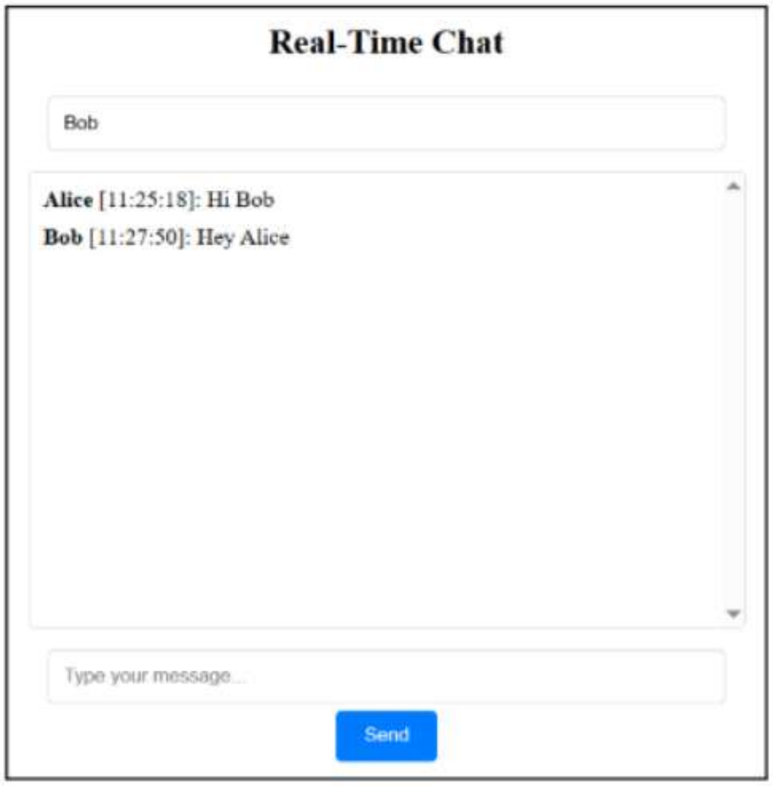
App.css :::

```
/* realtime-chat-frontend/src/App.css */
body {
    background-color: #f0f0f0;
    font-family: Arial, sans-serif;
    display: flex;
    justify-content: center;
    align-items: center;
    min-height: 100vh;
    margin: 0;
}

.chat-container {
    padding: 20px;
}

.chat-box {
    width: 400px;
    height: 550px;
    background-color: #fff;
    border: 1px solid #ccc;
    border-radius: 8px;
    box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
    display: flex;
    flex-direction: column;
    padding: 15px;
}

.title {
    text-align: center;
    margin-bottom: 10px;
    font-size: 1.5em;
}

.username-input {
    padding: 8px;
    margin-bottom: 10px;
    border: 1px solid #ccc;
    border-radius: 4px;
    width: 100%;
    box-sizing: border-box;
}

.message-list {
    flex-grow: 1;
    border: 1px solid #ddd;
    padding: 10px;
    overflow-y: auto;
    margin-bottom: 10px;
    background-color: #f9f9f9;
}

.message-item {
    margin-bottom: 5px;
    line-height: 1.4;
    word-wrap: break-word;
}

.user-time strong {
    font-weight: bold;
}

.input-area {
    display: flex;
}

.input-area input[type="text"] {
    flex-grow: 1;
    padding: 10px;
    border: 1px solid #ccc;
    border-radius: 4px 0 0 4px;
    box-sizing: border-box;
}

.input-area button {
    padding: 10px 15px;
    background-color: #007bff;
    color: white;
    border: none;
    border-radius: 0 4px 4px 0;
    cursor: pointer;
    transition: background-color 0.2s;
}

.input-area button:hover:not(:disabled) {
    background-color: #0056b3;
}

.input-area button:disabled {
    background-color: #ccc;
    cursor: not-allowed;
}
```

OUTPUT:



Alice [11:25:18]: Hi Bob



Alice [11:25:18]: Hi Bob
Bob [11:27:50]: Hey Alice