Design Pattern Type (Creational, Structural, Behavioral, Concurrent)	Design Pattern Name	Implementation in Project
Creational	Singleton	In our project, we use the "WebSocket" constructor from the ratchet library to instantiate a single WebSocket which is the medium that allows the different chats to communicate with each other
Structural	Facade	We created the "Chat" class in "Chat.php" which implements features from the "MessageComponentInterface" class in the ratchet library. This allowed us a simpler interface to implement the components we needed to build the chat room without going through the more complex ratchet library.
Behavioral	Chain of responsibility	ChatBar.jsx handles when a message is sent via "Enter." Then, ChatBar.jsx calls the method "updateChat" in ChatLog.jsx. updateChat then logs the message to the console, calls the "send" method in the react library and the "onMessage" method which is contained in Chat.php. updateChat also sends the data to firebase for logging.
Behavioral	Observer or Publish/Subscribe	When a user sends a message, we need to update the user's chat and all other arbitrary chat's to show the

		message and we need to log it in firebase. This updating is done between the ChatLog.jsx and ChatBar.jsx
Behavioral	State	When starting chat-server.php, we create a new object "$server" which is a type of "IOServer," this instantiates a httpServer, WsServer, and chat object. We change the state of the server to "run,"
Behavioral	State	In Chat.php, whenever a new connection is made to the chat, we create a new "ConnectionInterface" and change the state via the method "onOpen." If the connection is closed, we change the state of "ConnectionInterface" via the method "onClose." Both call methods in the ratchet library.
Creational	Factory Method	When we create an IOServer called "$server" in Chat.php, we call the IOServer method "factory." Factory takes 3 parameters, $component, int $port, string $address and returns an IOServer. Factory simply handles the IO requests (chats being sent) through $server but does not specify what type the IO is.

EECS 448 Design Patterns
Team 10
10/25/20