**Game Controls : WASD.**

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|---|---|---|---|
| Teo Zheng Yong Theon | zhengyongtheon.teo | 390003119 | Base Networking set-up |
| Choo Chi Keong Bryan | c.choo | 390003319 | Dead Reckoning |
| Kevin Hartono | kevin.hartono | 390006019 | Lock-Step |

**How to Run**

- First pair of addresses will be owned by the client with the rest belonging to the other clients. (eg. **localhost:2048** localhost:2049 localhost:2050 localhost:2051)

**Packets**

- Packets have a base class “Packet” which contains the packetType information so that the receiver can deduce the type of information being received.
- Ping packets are sent at prefixed intervals to determine the Round Trip Time of packets between the client

**Start of Connection**

- Client starts by sending a Connection Request packet to all other clients
- The client with the lowest player index will be assigned as the “host” of the game.
- When a client requests for a connection and does not get any reply. It will instead appoint itself as the “host” and start its own “game session”.
- The “host” is in charge of sending a Connection Reply packet to the requesting client.
- The Requesting client then replies to the Connection Reply with a Connection Confirmation packet.
- The “host” will then notify any other connected client about the new connection upon receiving a Connection Confirmation packet.

**Gameplay**

- Movement data packets containing information regarding the player’s movement is only sent when a player triggers/releases a key. This is done to reduce the network traffic compared to sending positional data every few frames.
- The movement data packets that are sent will then be used by the other clients to predict that player’s movement within a certain expected delay. In the chance of a mis-prediction. The Client will correctly interpolate the mis-predicted player to the correct position.
- All clients will enter lockstep mode only when potential contention occurs. This means whenever a player collides with anything that it can potentially interact with, all clients will enter lockstep mode.

**Disconnection & Reconnection**

- If a client crashes, the rest of the clients will notice that it crashed after it has stopped replying to a certain number of ping packets. It will then disconnect that client.
- If a client closes, it will send a Disconnect Notification to let the other client knows that it is going to reconnect.
- If a client tries to reconnect to an existing session, the host will reply with a full state of the game and connect to that session.
- If the host disconnects, all of the clients will reappoint a new host using the lowest player index rule.