Readme

Usage Server

- Open a terminal and navigate to the directory containing the script.
- Run the script using the following command python3 server.py
- The server will start listening for connections from Train1 and Train2.
- Ensure that Train1 and Train2 are configured to connect to the correct IP address and port as specified in the script.

Features

Password Exchange

The server and trains exchange passwords at the beginning of the connection to ensure secure communication. Passwords are hashed for secure comparison.

Train Movement Monitoring

The server continuously monitors the movement of Train1 and Train2 on a specific track. It checks for the following conditions:

- **Emergency Stop (EMERGENCY STOP):**
- Trains come closer than required.
- Exceeded speed 5 km/hr in the opposite direction.
- **Warning Alert (WARNING):**
- Trains are in the same direction, and the speed of the trailing train is higher.
- Exceeded speed 2 km/hr in the opposite direction.
- **Directional Stop:**
- If one train is in motion, the server sends a stop signal to the other train in the opposite direction.

Track-Specific Logic

The server includes logic specific to Track 78, where certain actions are taken based on the location and direction of the trains on the track.

Usage Trains

- Open a terminal and navigate to the directory containing the script.
- Run the script using the following command:

python3 train_client.py

- The client will connect to the train station server specified by the IP address and port in the script.
- Messages representing the movement of the train will be sent to the server.

Features

Password Exchange

The client and server exchange passwords at the beginning of the connection to ensure secure communication. Passwords are hashed for secure comparison.

Message Format

The client sends messages to the server in the following format:
"Train number Track_number loc1 loc2 Speed Length of train”

- Train number: The unique identifier for the train.
- Track number: The track on which the train is moving.
- loc1: The current location of the train.
- loc2: The destination location of the train.
- Speed: The speed of the train.
- Length of train: The length of the train.

Emergency Stop

The client includes logic for an emergency stop condition in case of technical issues or server errors.

Time Delay

The script measures and prints the time delay between sending a message and receiving a response from the server.

Message Simulation

The client sends a sequence of messages simulating the movement of the train. You can modify the messages list to customise the train's movement.