BrickMMO GPS Requirements Document

1. Student Names:
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2. Project Name: LEGO City GPS

3. Technology stack:
   Python
   Frontend
   - REACT
   Backend
   - Node
   - SQL for the database

4. Project Purpose:

   The BrickMMO GPS is a web-based application that allows users to track the locations of LEGO cars in a virtual city. The application will be useful for LEGO enthusiasts, gamers, and anyone who wants to explore a digital city in real-time. The application will include features like live tracking of cars' movements on a 2D map and the ability to view past locations of each car. The application will work by collecting data from the cars' movements and storing them in a database. Users can access the data through a deployed website, which will show the cars' current location in real-time and allow them to view past locations of each car. The application will be built using Python for the tracking functionality, REACT for the frontend, Node for the backend, and SQL for the database.

5. Features list:

   Must haves:
   - Track the x-y coordinates of each car on a 2d grid map
     o Automatically perform this process repeatedly after a set interval of time
   - Insert each car coordinate into a database after each tracking event
   - Allow for viewing live data of car locations on a deployed website
   - Allow for viewing of past car locations
     o Slider bar to show location history of a vehicle

Should haves:

Nice to haves:
- Traffic jams: detect when many cars are in the same vicinity
    o Create a red zone on the map in these areas

6. Features Breakdown:
    a. Narrative description
        o Viewing the live map of multiple cars (non-admin user)
            ▪ User will search and open the GPS brickmmo website
              (https://gps.brickmmo.com/)
                • The frontend will be deployed using this domain
            ▪ User will see a digital 2d map of the Lego city with up to 7 cars on it
                • This frontend will be built with REACT
            ▪ The user will see the cars move in real time
                • Data will be retrieved from an SQL database using Node and
                  outputted onto the REACT frontend
        o Viewing the history of car locations (non-admin user)
            ▪ User will click on one of the cars that is displayed on the map
            ▪ They will be taken to another screen showing the same map with only
              the selected car visible
            ▪ The user will use a slider to see the past locations that the car has
              been in the city
                • The locations will be retrieved from historical data saved in
                  the SQL database
        o Admin Access features
            ▪ Add cars to the city GPS application
            ▪ Delete cars from the city GPS application

    b. User stories
        o A user will visit the Brickmmo GPS website
        o They will be able to see the virtual map of the Lego city with the current car
          locations automatically updating in real time
        o They will slide the history slider bar to go back in time and see the past car
          locations

    c. Database description (including entity map)
        o Excel document with tables
    d. Dataflow diagrams:
       https://www.figma.com/file/1eUnskBFVFieeCzhOZWzwH/
       Brickmmo_LegoCity_DataFlowDiagram?type=design&node-id=0-
       1&t=H50Cr8fCzLjOzsld-0

    e. Wireframes
       https://www.figma.com/file/Xk7LW8CfDQWfyQzT0kQv2b/BrickMMO-GPS-Wireframes?type=design&node-id=0-1&t=IcyfYydkirkTKZr5-0

7. Project Timeline