Final Report

for

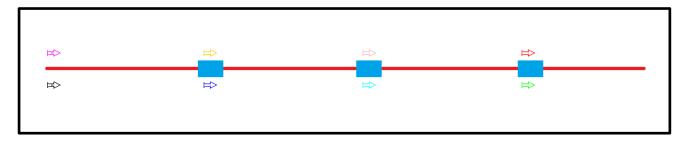# Relay Simulator

Prepared by음료수가 없어요

Angel Echevarria & Preethi Vaidyanathan

16.35 Real-Time Systems and Software
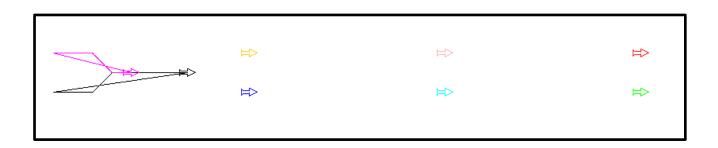
Preethi Vaidyanathan & Angel Echevarria

1. **Overview**

We have created a simulation of a track and field relay race. This relay is a race between two teams consisting of four athletes each. In the figure below, the red line indicates the track. Vehicles may not overlap on the track, which will be further discussed in section 3, Passing. All of the vehicles begin offset because of this constraint, and then merge onto the track. The blue zones indicate the sections where vehicles may "hand off the baton", which is where one runner stops running and the next leg begins running.

2. **Merging and handoffs**

Because no two vehicles may occupy the same spot on the track, runners enter the track by merging. This is when the run at an angle until they reach the y-coordinate of the track, and then they run forward. Vehicles are timed to begin merging such that they intercept and have a "handoff" in which the hasBaton of the previous runner is set to false, and the hasBaton of the next runner, the one receiving the handoff, is set to true.

3. Passing

When runner A is behind and going faster than runner B, it will calculate if it has enough time to pass runner B (as in, it can pass runner B and be back on the track before entering the next handoff zone). If there is enough time, then it will overtake the next runner by travelling at an angle, speeding up for a straight segment, and then rejoining the track.