Andrew Lightfoot **Functional Requirements**

1. **Multiple Cars and Graphical Interface**
   * The system shall allow defining multiple cars to participate in the race.
   * The system shall include a graphical interface or animation that displays the cars and their movement in real time.
2. **Locations/Stops**
   * The system shall provide a set of locations/stops that cars can travel between.
   * Each location/stop is uniquely identifiable
   * The system shall allow each car to have a unique route consisting of a starting stop, zero or more intermediate stops, and an end stop.
3. **Car Movement and Randomization**
   * The system shall simulate each car’s travel from stop to stop, including randomizing certain factors to mimic a “real” race environment.
   * The system shall calculate the time taken for each car to travel between stops based on randomized speeds or other attributes.
4. **Race Progress Tracking**
   * The system shall keep track of each car’s progress, including its current position (stop) and the time so far in the race.
   * The system shall update the race progress in real time in the user interface.
5. **Completion and Winner Determination**
   * The system shall detect when a car reaches its final stop.
   * The system shall calculate the total time taken by each car to complete its route.
   * The system shall compare the total times to declare the car with the shortest time the winner of the race.
   * The system shall display the winner in the user interface upon completion of all cars’ races.
6. **Race Data Presentation**
   * The system shall display each car’s route (list of stops to be visited in order), its speed, and the total time taken.
   * The system shall provide a final summary showing all cars, their routes, their total times, and the winner.
7. **Game/Prototype Control**
   * The system shall offer a way to start/reset the race.
   * The system should allow users to set or select various parameters (number of cars, number of stops).
8. **Extensibility/Additional Classes**
   * The system design shall support clear separation of concerns.
   * The system shall be open to future modifications or enhancements (adding obstacles and the like).