

Backend Development

Improving the Grand Prix experience
for F1 viewers at home

S8 Graduation FHICT

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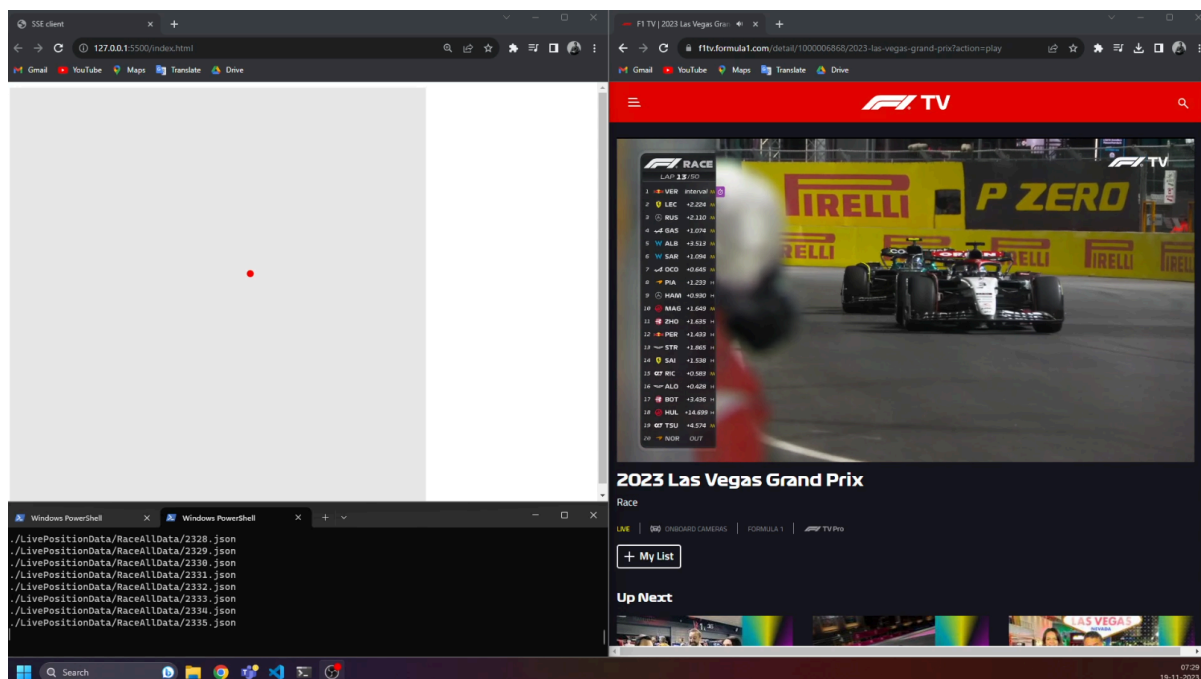
Introduction

Before I start working on the front-end of the new liveblog, I have to make the necessary information available by building a backend script. I applied the insights I found during the interview with DevOps expert Jordi and was able to build a functioning script for the backend that will run on the EC2 server. In this document you'll read about my approach in the development of this script and how I'll further use it in the development of my project.

Approach

This script will have to connect with the Formula 1 data source, process the information stream and send the detected events to the front-end. I'm not a software student, and backend development actually falls outside of the scope of my project. Therefore, I decided to make life easy by utilizing ChatGPT for the logic of this script.

I used my screen recordings of the Vegas GP to know where events happened during the race. This is how I knew which moment of the race the development API needed to send to the backend to develop the functions for detecting a specific event.



First I coded the basic logic to connect to the development API I built earlier. Every time the backend script receives data from the development API, multiple functions are executed to detect events happening during the race.



I instructed ChatGPT by explaining what my script should do and what the data looked like that was sent by the development API. ChatGPT outputs a working function and explains how I should implement the function in the backend script.

**ChatGPT**

To prevent the console log of an overtake when a driver gains a position over another driver who is out of the race, you need to check the `IsOut` status of the overtaken driver in your `detectPositionChanges` function. You can use the `DriverRaceInfo` data to determine if the overtaken driver is out of the race.

Here's how you can modify your `detectPositionChanges` function:

javascript

Copy code

```
function detectPositionChanges(newData, driverRaceInfo) {
  if (previousPositionData) {
    Object.keys(newData).forEach((driverId) => {
      const currentDriver = newData[driverId];
      const previousDriver = previousPositionData[driverId];

      if (currentDriver && previousDriver) {
        // Check if the driver has gained a position
        if (currentDriver.Position < previousDriver.Position) {
          const overtakingDriverName = driverList[driverId]
            ? driverList[driverId].FullName
            : "Unknown Driver";

          // Find out who was overtaken
          const overtakenDriverId = Object.keys(previousPositionData).f
            (id) =>
```

Result

```
Windows PowerShell
2023-11-19T06:33:41.6816109Z In lap 16, Logan SARGEANT entered the pit with MEDIUM tyres.
2023-11-19T06:33:44.7186993Z In lap 16, Fernando ALONSO moved up to position 13, overtaking Driver Carlos SAINZ.
2023-11-19T06:33:49.7599522Z In lap 16, Daniel RICCIARDO moved up to position 15, overtaking Driver Kevin MAGNUSSEN.
2023-11-19T06:33:50.7828666Z In lap 16, George RUSSELL exited the pit with MEDIUM tyres.
2023-11-19T06:33:56.8207422Z In lap 16, Valtteri BOTTAS moved up to position 16, overtaking Driver Kevin MAGNUSSEN.
2023-11-19T06:34:02.8723006Z In lap 16, Logan SARGEANT exited the pit with MEDIUM tyres.
2023-11-19T06:35:04.4297041Z In lap 17, Charles LECLERC moved up to position 1, overtaking Driver Max VERSTAPPEN.
2023-11-19T06:35:06.4516186Z In lap 17, Max VERSTAPPEN entered the pit with MEDIUM tyres.
2023-11-19T06:35:15.5362476Z In lap 17, Esteban OCON moved up to position 4, overtaking Driver George RUSSELL.
2023-11-19T06:35:17.5625571Z In lap 17, Lewis HAMILTON moved up to position 5, overtaking Driver George RUSSELL.
2023-11-19T06:35:18.5629954Z In lap 17, Sergio PEREZ moved up to position 6, overtaking Driver George RUSSELL.
2023-11-19T06:35:18.5629954Z In lap 17, Alexander ALBON entered the pit with MEDIUM tyres.
2023-11-19T06:35:20.5904118Z In lap 17, Oscar PIASTRI entered the pit with HARD tyres.
2023-11-19T06:35:23.6140771Z In lap 17, George RUSSELL moved up to position 11, overtaking Driver ZHOU Guanyu.
2023-11-19T06:35:24.6057608Z In lap 17, ZHOU Guanyu moved up to position 11, overtaking Driver George RUSSELL.
2023-11-19T06:35:25.6257698Z In lap 17, Fernando ALONSO moved up to position 12, overtaking Driver George RUSSELL.
2023-11-19T06:35:31.672413Z In lap 17, Daniel RICCIARDO moved up to position 14, overtaking Driver Logan SARGEANT.
2023-11-19T06:35:32.6918814Z In lap 17, Max VERSTAPPEN exited the pit with MEDIUM tyres.
2023-11-19T06:35:36.7181025Z In lap 17, Valtteri BOTTAS moved up to position 15, overtaking Driver Logan SARGEANT.
2023-11-19T06:35:39.7380102Z In lap 17, Alexander ALBON exited the pit with MEDIUM tyres.
2023-11-19T06:35:43.7735765Z In lap 17, Oscar PIASTRI exited the pit with HARD tyres.
2023-11-19T06:36:55.3423417Z In lap 18, Pierre GASLY entered the pit with MEDIUM tyres.
2023-11-19T06:36:56.3514868Z In lap 18, Esteban OCON moved up to position 2, overtaking Driver Max VERSTAPPEN.
2023-11-19T06:36:57.3549018Z In lap 18, Sergio PEREZ moved up to position 3, overtaking Driver Max VERSTAPPEN.
2023-11-19T06:37:01.3518068Z In lap 18, Lance STROLL moved up to position 5, overtaking Driver Max VERSTAPPEN.
2023-11-19T06:37:04.3888473Z In lap 18, Oscar PIASTRI moved up to position 10, overtaking Driver Carlos SAINZ.
2023-11-19T06:37:05.3941338Z In lap 18, Alexander ALBON moved up to position 10, overtaking Driver Oscar PIASTRI.
2023-11-19T06:37:06.3985325Z In lap 18, Lewis HAMILTON moved up to position 10, overtaking Driver Alexander ALBON.
2023-11-19T06:37:07.4121293Z In lap 18, Max VERSTAPPEN moved up to position 10, overtaking Driver Lewis HAMILTON.
2023-11-19T06:37:12.4485819Z In lap 18, Lewis HAMILTON entered the pit with HARD tyres.
2023-11-19T06:37:14.4607298Z In lap 18, Daniel RICCIARDO entered the pit with MEDIUM tyres.
```

The result is a script that logs the events that happened during the race. I purposely included the time and lap for each event, as I'll need this information in the front-end. The script doesn't do anything else than logging the events. Later, when I'm building the front-end, I can simply add logic for the websocket to send the events to the front-end.

Conclusion

With the help from ChatGPT, I was able to develop a script that processes the eventstream and detects events and logs them in the console. I still have to implement the logic for the websocket that will connect the front-end with the backend, as defined in the interview with DevOps expert Jordi. This will be done when the front-end is realized.

Summary

I built a backend script that will process the eventstream from the undocumented API, detects events and logs them in the console. During the development of the front-end, the websocket logic will be implemented to send the events from the backend script to the front-end. This script will run on the EC2 server as defined during the interview with DevOps expert Jordi. For now, the script logs the time of the event, in what lap the event happened, and the text for the liveblog message, as this is the information that I'll need for the front-end.

Learning Outcome Clarification

- Learning Outcome 1: Professional Duties
- Learning Outcome 4: Investigative Problem Solving

This deliverable is a professional duty on a bachelor level in the activity of Realize, as I realized a backend script for the new liveblog that I'm going to build. It is also a professional product as a result of a professional duty as I interviewed an expert before building my backend script and built the script for the EC2 server as discussed during this interview. Therefore, Learning Outcome 1: Professional Duties applies.

For this deliverable, I used results from research to create valuable solutions as I interviewed an expert to know how to build the backend script for the new liveblog. Therefore, Learning Outcome 4: Investigative Problem Solving applies.