Semester Championship Documentation

*Vehicle Mechanics Fundamentals*

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# General

## My goal

First, let me explain the strategy chosen. I have decided that I don't want to tune the car for a specific type of track and win those races, but I want to achieve an average best setting for all tracks. Thus, when optimizing the car, I always aimed to minimize the total lap time for all tracks.

## Tools

I have recorded the actual parameters and costs in tabular form to keep track of the results. Including simulated lap times, improvement rates, total lap times, total improvement, and deviation of improvements for each track. The table contains brief information on changes, conclusions, and decisions for the current setting. In the first phase of setting up the car, I used only this to narrow down the range of settings to those that were probably optimal.

## Development stages

In the first phase, I wanted to find an initial setup where all costs are used for one component. From this setting, I can think backwards to develop the setting further. In the next phase, I have logically combined the parameters in proportion to the improvements in the initial settings, further narrowing the range of possible good settings. Once I had narrowed down the possible settings and got an idea of the impact of the parameters, in the third phase I used the corresponding Optimum Lap diagrams to investigate the effects of the changes, make decisions and find the best setting.

## Development cost table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Development cost table* | | Step | | Cost | Default |
|  |  | step unit | dimension | $/step | value |
| **Tire Data** |  |  |  |  |  |
|  | Longitudinal Friction | 0.005 | - | 10.00 M | 2.100 |
|  | Lateral Friction | 0.005 | - | 20.00 M | 1.950 |
| **Aero Data** |  |  |  |  |  |
|  | Aero Efficiency | 0.010 | - | 5.00 M | 2.000 |
| **Scaling factors** | |  |  |  |  |
|  | Power factor | 0.100 | % | 1.18 M | 100.000 |
| **General** |  |  |  |  |  |
|  | Weight | 0.500 | kg | 1.20 M | 743.000 |
| *The available budget for the team is* | | | 100.00 M | | |

# First development stage

A képen szöveg, képernyőkép, szám, Betűtípus látható

Automatikusan generált leírás

# Second development stage

A képen szöveg, képernyőkép, szám, Párhuzamos látható

Automatikusan generált leírás

# Third development stage