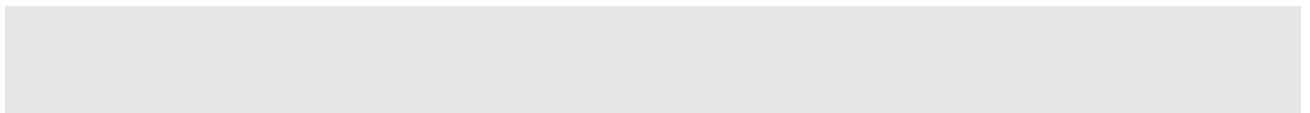




CAERise

Onboarding Technial Evaluation



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Analytics Programming Exercise

One of the technical expertise a member of the CAERise team has to showcase is the capacity to ingest simulation data, analyse it and presents the results in a consumable format. The following exercise is meant to understand your level of expertise on this topic. This is not a fail/pass exercise. If you feel you lack the background to answer some of them, you may skip them. This exercise should not take more than 4 hours to complete.

The main objective is to write a computer code, using the Python programming language that will read the provided sample data files, generate some graphics and publish the results. You may use any of the public libraries you are familiar with like numpy, pandas, matplotlib, plotly or others. You may partition your code in one or multiple files and use classes if you are familiar with this programming paradigm.

Read simulation data

The first objective is to:

- Read the provided data. In these two files, each row stores the value of a given parameter (Uri) at a given time stamp. Data files:
 - o Telemetry_R00000036_2020-01-08T11.43.21Z.zip
 - o Telemetry_R00000036_2020-01-08T11.47.38Z.zip
- Transform the data into a more consumable format by building a dataframe (csv like table) where each row is associated with a given time stamp and each column is a given parameter. You can use the URI values as the column names and the OriginTime as your reference time. All other data may be discarded.
- Save that dataframe to the disk such that it can be re-used at later stages.

Plot telemetry data

Now that the data is in a consumable format, use the plotting library of your choice to presents the air temperature, altitude, the ground speed, the pitch angle and the aircraft on ground flag as a function of time.

Visual inspection

Based on a visual inspection of the data (no code required here), please explain what type of manoeuvre has been executed and why. This can be done a block of comment in your code.

Metrics computation

Define an algorithm that will compute:

- The average airspeed while the aircraft was in the air
- The pitch angle at touchdown
- The distance traveled on the runway after the touchdown

Data sampling rate

You may (or may not) have realized that not all parameters are sampled at the same rate. Some parameters even display a variable sampling rate. Can you:

- Identify the minimum sampling rate
- Identify the maximum sampling rate
- Could you guess why not all parameters are sampled at the same rate?
- Try to explain what could cause a change in the sampling rate for some parameters.