

AIQ – Assignment for Backend Engineer Roles



Dear Candidate,

Thank you for your interest in joining AIQ. As part of the hiring process, we invite you to complete the two technical challenges described below **within 7 calendar days from receipt**.

Challenge 1

Suppose we want to show a map to visualize the annual net generation of power plants of the US.

The challenge consists of the following requirements:

- We want to display the top N plants.
- On the map we want to show the absolute value and percentage of the plant's federal state.
- We want to be able to filter by state so we can zoom in.
- The data usually comes as an excel file:
<https://www.epa.gov/egrid/download-data> (eGRID2021 Data File)
- Build a typescript backend that backs this map with a REST API.
- Use a database to store the data (we prefer Postgres but you can use others)
- Containerize the solution.

Challenge 2

Attached is a csv file which contains image data referenced by the column depth. The rest of the columns (200) represents image pixel values from 0 to 255 at each depth.

The challenge consists of the following requirements:

- The image size is relatively big. Therefore, there is a need to resize the image width to 150 instead of 200.
- The resized image must be stored in a database.
- An API is required to request image frames based on **depth_min** and **depth_max**.
- Apply a custom color map to the generated frames.
- The solution should be based in Python.
- Containerize the solution.

Guidelines

- Readiness of the code is especially important - non-working solutions will not be considered.
- Demonstration of great understanding of the requirements is extremely important.
- Reasonable assumptions are very welcome, though they must remain within the required scope.
- Use all tools, including LLMs, as in real work to enhance problem-solving.
- Higher standards apply: Solutions should be polished, forward-thinking, and innovative.
- We appreciate candidates that go just the extra mile to anticipate further changes in their solution.
- Both challenges must be completed within 7 calendar days from the time you receive this document.

If you have any questions, please feel free to reach out to us.

We wish you best of luck!