

## Take Home Problem Statement

Imagine a dataset adhering to the following format:

<numerical\_id><underscore><numerical\_value>

e.g.

```
11111111_10
22222222_10
33333333_11
12345678_10001
23456789_10001
.
.
.
N
```

Build a FastAPI application which can process data in the above format and return the numerical ids associated with the top X numerical values.

In the above example, if  $X = 3$ , the return would be:

```
12345678
23456789
33333333
```

Note that repeated numerical values count as individual entries. We can assume that the order in which the return is given does not matter, we simply want the top X values.

**Your solution should account for extremely large datasets.**

You can choose to be as creative as you like with the solution and can use any pieces of technology you would like. The purpose of this exercise is for you to be able to showcase to us your awesome coding skills and problem solving abilities.

Keep in mind that your submission will be treated like production level code, so please make sure you write clean, type hinted code with all the python bells and whistles needed to keep a project well maintained.

## Submission instructions

1. Please submit your project via a public github url or a zipped project dir.
2. Please include a README.md file with instructions on how to run the project.
3. The project should include test data to run the project with.
4. Your project should have ways to profile the performance of your application.
5. Your code should be type hinted.
6. Please include commentary on the performance of your application with regards to time and space complexity.

Best of luck! We're excited to see your submission!