Nuxtu SAS
Technical examination
Software Development Engineer
13/Jun/2022
Deadline: 18/Jun/2022 - 23:59

For this technical examination you may use any books, notes, web pages, tutorials, documentation, or any other type of information source. You **may not** discuss this exam or questions related to the exam with your fellow contestants. It is also prohibited to ask for help from anyone you know that has experience on these topics, doing so will disqualify youfrom this and any future selection processes at ***Nuxtu***.

Feel free to ask any question related to this examination to our *Chief Technology Officer* through his Nuxtu email oscar.diaz@nuxtu.co and CC ana.palomares@nuxtu.co remember: **the only bad question is an unasked one.**

At the end of this examination, the following deliverables are expected:

- Documentation (in English) that briefly explains your implementation (this must be done in the README.md file on your repository)
- An URL to your implemented solution. This solution must be in AWS, and the URL can be an Elastic Beanstalk URL or an EC2 IP/DNS. (Please include a .zip file withthe source code)
- Be prepared to answer any questions related to your solution. This will show us that you completely understand your implementation, which is the most important part of this examination.

Work hard. Have fun. Make history!

Jeff Bezos

The National Institute of Health (INS) has hired ***Nuxtu*** to develop a data science dashboard solution related to the COVID-19 global pandemic that has been afflicting our country for the last 2 years. The goal of the project is to create a cloud-based application that helps the INS employees to process the last 10.000 COVID-19 cases that has been reported in the country.

The developed application will be executed daily by someone in the INS, which means that it must be easy to use, simple and highly intuitive. The INS has provided ***Nuxtu*** with the following information for the deployment of the project:

- Data-set: https://www.datos.gov.co/api/views/gt2j-8ykr/rows.csv
- Docs: https://www.ins.gov.co/BibliotecaDigital/dataset-casos.pdf

The INS has told ***Nuxtu*** that someone will manually select 10.000 rows (with headers) from the Data-set CSV file and upload them to the cloud application in the exact same format as the original file. The users will access an URL where they will be able to select the location of the file to upload from their computer, after the upload has been completed the server-side must process the information and show a web report to the user with the following information: (**Remember error handling if the CSV format is incorrect.**)

- Fatality rate per gender (M/F).
- Pie chart of patients in each of the possible states (*Leve, Moderado, Grave, Fallecido*).
- Mean and standard deviation of age in dead patients.
- List of the 3 cities with the highest number of cases.
- List of the 3 cities with the lowest number of cases.
- Mean recovery time (time from the start of symptoms to the recovery date).
- Mean death time (time from the start of symptoms to the death date).

Note: All this information must be calculated over the 10.000 rows file.

The contract between the INS and ***Nuxtu*** stipulates that the following technologies must be used in order for the project to be compliant:

- AWS Free Tier architecture (e.g. EC2, RDS, EB).
- Python 3 back-end in Amazon Linux.
- Django 3 framework.

Any other open-source technology may be used in order to solve the problem in the must efficient way possible. The effectivity and scalability of the solution will be taken into account during the assessment. Your manager has provided you with an example of the possible architecture that would solve the proposed challenge, but you are free to implementany other architecture that you' d like: