AI FOR ACADEMIC GUIDANCE

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Question 1: What is the main problem that you are solving?

Decision-making is an indispensable process for the development of the individual. Indeed, in a world full of uncertainty, the latter is associated with regret and the fear of making the wrong choice, since making decisions can be complicated. On the other hand, an unconsidered decision can lead to disastrous results on one's future, hence, the importance of guidance in general, and more specifically in a field such as education.

Question 2: What is the importance of this problem?

Educational orientation aims to assist students in their decision-making by proposing personalized choices based on several criteria. Moreover, it can determine the students' career as well as increase or reduce their productivity, or even impede it.

Question 3: What are the current solutions?

Traditional solutions can be adopted, as governments and private companies offer support and guidance services to students during their school and university careers by providing expert guidance counselors. These solutions generally rely on the use of psycho-technical tests and evaluation questionnaires. However, thousands of students around the world do not have access to this advice and guidance, due to the small number of counselors and the exponential increase in the number of students each year. On the other hand, counselors rarely have access to students' grades, which leads to inaccurate

guidance, thus neglecting their skills. In the age of digital transformation, artificial intelligence-based solutions have been proposed allowing students to explore the paths of alumni in order to choose the appropriate training.

Question 4: How will your solution solve the problem? What is new?

Indeed, educational orientation should not only depend on what the student prefers but also on his abilities and skills in order to guarantee a better professional integration. It is from this perspective that we propose a new AI-based solution. The latter takes into account the student's grades in order to recommend the most suitable course for his profile that can meet the maximum expectations of his future job.

Question 5: What is the expected impact of your solution from various perspectives (social, commercial, environmental, etc)?

Economically speaking, training students who are passionate and motivated by their fields will result in an increase in terms of productivity once hired, thus providing companies with a considerable financial gain. Through this approach, we also bring various social benefits. Guiding a student into the right study path will help him/her have more motivation, willingness and above all innovation. In addition, the stress that an individual may experience during their academic or professional career, which is considered as a major factor of depression, will be considerably reduced.

Question 6: Give a high level functional description of your solution. How will it be used?

AOAI (Academic Orientation using Artificial Intelligence) is adapted to the study path proposed by each school as well as the history of its students and alumni. As a first step, the student begins by providing his/her ID through the portal of his/her school. In the second step, a questionnaire will be proposed measuring self-knowledge. Through this questionnaire, the solution will be able to understand the motivations of the students as well as including them in the processing of AOAI's algorithm. This algorithm takes as inputs the grades of students with similar profiles during the course of the training, the specificities of the courses, and the professional experience of the alumni in order to carry out a well-informed orientation of the student. Our solution offers details justifying the favoring of one track or the disadvantage of another.

Question 7: Give a high level technical description of your solution: architecture, technology, integration, innovative components, etc.

The main concept of our solution is the integration of AI in students' orientation. For this purpose, two supervised learning models will be built using Python. The first model defines the ranking of courses based only on students' grades. This ranking constitutes the initial results that we will use to determine the content of our dynamic questionnaire. While the second model will take into consideration not only the grades but also the student's preferences from the fulfillment of the dynamic questionnaire. The final results will be presented as a ranking of courses accompanied by a detailed analysis explaining the decisions made by the AI model.

Question 8: Give a high level description of your solution development environment, platform, tools, etc.

The implementation of our solution is web-based in order to make it accessible from any terminal and browser. The development of our API will be ensured by different technologies, including Node.js, Express.js and Python. As for the front-end, React.js and native JavaScript will be used. As far as AI is concerned, our two models will be developed with Python and adapted to the data entered (e.g., number of threads and modules). The development environment used is Anaconda, a secure tool offering robustness and resource richness for data science.

Question 9: How will you manage your product development cycle, your quality assurance process, your solution deployment logistics, etc?

As a continuous improvement process of our solution, we intend to collect data on the students' professional experiences such as projects, internships and activities carried out and to measure their satisfaction throughout the academic year. As an extension of our solution, a recommendation for inter-institutional courses will be made, allowing us to take into consideration several paths, students and opportunities.

Question 10: Give the most relevant plans that you have developed for your project (for example, time schedule, resource plan, training plan, risk management, contingency plan, etc.)

For the conduct of our project, we will respect the following steps: first we will start by forming groups and assigning tasks. Secondly, we will study the set of ML algorithms and tools needed for our project. Thirdly, we will collect the students' grades, set up forms to be sent and retrieve the answers. Fourth, train the machine on the collected data. Finally, develop the front-end part and integrate it on a web page and ensure its continuous improvement.
During this process, we will also aim to improve ourselves by continuously seeking training courses in the domains pertaining to this project such as agile scrum, cloud computing, artificial intelligence and javascript as all of these will aid us greatly in increasing our productivity and providing a better quality solution.

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