IPlytics' BackEnd Developer Challenge

Thank you for your application and interest in becoming part of our team.

For us, it is not all about your degree, CV or titles. Most importantly, we want to understand how you approach a concrete use case that's part of our daily work here at IPlytics. What is your way of thinking, how do you tackle the problem, which tools do you choose...?

In order to gain a comprehensive impression of your skills, we would like you to complete the following challenge. This is a simplified use case which illustrates the kind of work tasks that we're facing here at IPlytics on a daily basis.

The challenge is an excellent opportunity to demonstrate your style and your capabilities. It is a way to show us which kind of code you like to create.

There are no time limitations but we suggest you don't spend more than two hours on it. We are not looking for a bullet-proof solution but it has to be an elegant, intuitive, well-structured, clean and maintainable approach.

Fulfill the task in your own way and use the tools you are most comfortable with. Show us your skills!

You will find the detailed task description on the following pages of this PDF.

When you're finished, please zip your results and send them to: gerats@iplytics.com OR push them to your Github and provide us the link to the project.

And of course: Should you have any questions please don't hesitate to contact us:
brandt@iplytics.com

Good luck for the challenge!

1) Minimal Project Management System

A company wants to implement a minimal project management system, which helps them plan projects and tasks to increase the company's efficiency. Your task will be to implement some preoperational work in advance by transforming the data given by csv-files into entities and to write supporting code for accessing and adjusting these entities. The individual csv-files are attached in the email along with this task description and consist of 3 files: "employees", "projects" & "tasks".

Some general hints for this task:

- No GUI needed!
- No database needed (keep it in memory)!

The following requirements have been identified for the system: The system should manage employees. Each employee has a first- and a last name. Projects can be assigned to individual employees. In addition to that each employee has a direct supervisor, who is an employee as well.
Each project has a name and a start date. It consists of assigned tasks which have a specific time duration each, counted in days. Additionally, each project gets assigned a specific *slack time* (e.g. 5 days), which denotes how much a project can be delayed beyond its start date, without causing any problems in the completion of the project by its due date. Each project also has an end date (deadline) which results from the start date + the sum of all assigned tasks + the defined slack time (end date = start date + sum of all estimated days of tasks + slack time). Each task has a name and a description. It also has an estimated time duration for completing this task. *Example: Project A starts on Jan 1st, the dedicated slack time is set to 3 days. The project consists of 5 tasks, calculated to take 3 days each, so all in all Project A is estimated to take 18 days (5 tasks * 3 days each = 15 + slack time 3 days = 18 days in total). In such the deadline is set for Jan 18th.*

The following functionality should be available:

- Importing of existing employees based on the employees.csv (check for invalid rows and duplicates)
- Importing of existing projects based on the projects.csv (check for invalid rows and duplicates)
- Importing of existing tasks based on the tasks.csv (check for invalid rows and duplicates)
- Assign a task to a project: By this the attributes „assigned tasks" and „end date" will be calculated/updated automatically
- Assign a project to an employee (an employee can only work on two projects at the same time).
- Delete a task (don't forget to update the underlying references)
- Delete a project (don't forget to update the underlying references)
- Display/View all employees
- Display/View all tasks for a given project
- Getting the total days needed for a given list of projects (assuming that projects can't be worked on parallel)

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