CODING CHALLENGE: PROJECT PLANNING

1. CONTEXT

Imagine an Oil & Gas operator with a portfolio of projects to execute, faced with the decision on *how to sequence these* in time. Each project has *project attributes* such as a production profile (correlating with how much revenue will be generated over time), a maturity (indicating from when onwards a project is ready for execution), and the type of hydrocarbon that will be produced (Oil or Gas).

2. BUSINESS QUESTION

How to *optimally plan this sequence of projects,* i.e. *in what sequence should I execute which projects from my total portfolio of available projects*?

3. GIVEN

Assume the following:

3.1 PORTFOLIO

A portfolio with projects to be planned is provided here as an Excel table:
https://www.dropbox.com/s/iu8jjkuesldq9vp/WSE_BusinessPlanning_InputToChallenge.xlsx?dl=0

Every project has the following properties:
- its name
- whether it's an Oil or Gas project
- the earliest date the project can be executed ('earliest spud year')
- how long it takes to execute ('duration')
- its production profile (how much Oil/Gas is produced, i.e. how much revenue will this project generate)

All projects are assumed to have the same cost profile.

Note: The earliest spud year is not necessarily the year of execution – it's the *earliest possible* year of execution. (The actual year of execution is a variable to be optimized by you.)

3.2 OPTIMIZATION

To address the business question, please consider the following scenarios:
- Scenario 1: optimize the project sequence for maximum Oil production in 2021-2025.
- Scenario 2: optimize the project sequence for maximum Oil production in 2021-2025 with a desire that gas remains as long as possible around 1M m3/d from 2021 onwards.

4. DELIVERABLE

Design one or more approaches that are capable of addressing the business question. Demonstrate the efficiency & robustness of your approach(es).

Tips
- Consider the *robustness* of your approach(es) against the assumptions provided above and any additional assumptions you have made.
- Think of how to *communicate* your findings: how do you convince the decision maker (customer) of your approach(es)?

project 1   project 2   project 3   ...   project N

time   time   time   time

how to allocate?

overall time

oil   gas