

# CODING CHALLENGE: LOGISTICS

## 1. CONTEXT

Imagine an Oil & Gas operator with offshore assets (e.g. platforms). These assets require regular visits from staff to carry out safety inspections, maintenance activities, interventions, etc. The *planning* of these visits is often complex due to different *value drivers* (e.g., not all activities are equally important and/or urgent) and *uncertainties* (e.g., weather may change on a daily basis and/or transport vehicles may be temporarily out of service).

## 2. BUSINESS QUESTION

How to *optimally allocate staff to transport vehicles* (e.g. helicopters), if the aim is to meet demand with maximum vehicle efficiency whilst being robust against uncertainty?

## 3. GIVEN

Assume the following:

### 3.1 SUPPLY OF STAFF

- The total number of available staff varies from day to day. Assume the total staff count can be described with a gaussian distribution with mean 60 and standard deviation 20.
- Staff are organized in teams with team sizes varying between 1 and 8. Teams cannot be split.

### 3.2 SUPPLY OF VEHICLES

- The operator has 4 helicopters. Two of them can carry 25 staff each, the others can carry 15 staff each.
- Helicopters can stop at more than 1 location within a single trip.
- Flight time is assumed negligible.

### 3.3 DEMAND

- The operator has 10 offshore locations that need maintaining.
- Demand across locations varies uniformly on a daily basis. That is, each day demand is randomly distributed across all locations.
- Each team is assigned to one offshore location. Multiple teams may be assigned to the same location, but a single team is never assigned to more than one location.

### 3.4 OPTIMIZATION

- The operator's aim is to allocate as much staff as possible with as few helicopters as possible.

## 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)?

