Challenge Description

1.1. Motivation

The task is based on the idea, that drones are used to deliver parcels from a distribution base. The delivery targets are buildings in a city, so the drone owner must ensure that the drones don't crash into buildings. Additionally it's required that the drones don't crash into each other. To deliver a high amount of parcel, the distribution base operator needs to use a swarm of drones as otherwise the delivery of the parcels take much too long.

As operating the drones by humans is very costly, the distribution operator wants to delegate this task to a software product which allows him to safely deliver the parcels as fast as possible.

1.2. General Requirements

The distribution operator (you) receives a list of delivery orders he needs to process. Those orders are published at the start of the solution demonstration. The parcels are already all at the distribution base. Those parcel may be delivered by 1 up to 3 drones.

A parcel is successfully delivered if the drone has picked it up from the distribution base (land there), then flied to the target coordinates and landed there.

While delivering parcels, the drone must not crash into buildings or into each other.

The challenge duration is limited to 5min. The velocity as well as the flying area limited too.It's also not allowed to fly over buildings.

It is only only possible to have 20 parcels pending at the same time. You need to deliver some before you can order more parcels to deliver.

1.3. Level 1

The drone can only take one parcel at a time and needs to fly back to the distribution base to get the next order.
Note: You can ignore the weight of the parcel and just assume that it's the maximum weight allowed to be transported by the drone.

1.4. Level 2

The drone can take multiple parcels at the same time up to it's weight limit. In level 2, the parcels have all the same weight so that the drone can take up to 3 parcels.
Note: You can still ignore the weight of the parcel and just assume that it's weight = 1.

1.5. Level 3

The parcels have a different weights, so that it's possible to load up to 3 weight-units of parcels into a drone. The weight of a parcel is in the set [0.5, 0.75, 1].

Here are some samples of what a drone could pick off:

- 6 x 0.5
- 4 x 0.5 + 1 x 1
- 2 x 0.75 + 3 x0.5

1.6. Bonus Challenge

The distribution operator would like to have an easy way to monitor the delivery orders and the progress of the delivery as well as the location of all the drones.

1.7. Challenge Criteria

Criteria	
Name	Explanation
Efficiency	How many parcels have been successfully delivered? (10 points for every delivered parcel)
	How many times did a drone crash into a building? (-15points for every accident) How many times did a drone crash into another drone? (-10points for every accident)
Idea, novelty, Wow factor	How creative is the realization? Does the hack present a new & unique functionality?
	Does the hack demonstrate a new solution/ a new angle / an increased scale on an older problem?
Instructiveness	How useful is the deliverable for developing a product out of the hack?
	How thoroughly is the idea thought through.
Features	Which level has been achieved by the team? Bonus points for Level 3 (+30 points). Bonus points for operator monitoring software (up to 50 points).
Noncriteria	
Name	Explanation
Technical complexity	Does the hack apply technical skills to solve a challenging problem? Is the hack impressive?
Stage skills	How entertaining was the pitch?
Aesthetics	Is the design of the control software aesthetically pleasing?