Requirement levels

This document contains the level of the requirements for the ILP Pizza Dronz project. It exams what level of testing each of the requirements should undergo and explains why this is the case.

Functional requirements

Listed below are the functional requirements for the project and an explanation as to which level requirement it is. I have grouped certain requirements so that they can be spoken about as a whole as well as separately.

> **The system must not allow for the drone's flight path to enter any no fly zones.**
>
> **Once the drone has re-entered the Central Area, it must not leave this area again until all of the pizza has been delivered to the drop off point.**
>
> **The drone should start and end every day at Appleton tower.**
>
> **After collecting the pizzas from outside the Central Area, the drone must return to the Central Area using the shortest distance possible.**

These three requirements concern the drones routing, and would be considered system requirements rather than unit or integration, as it would be near impossible to test these attributes without the rest of the system available.

> **The system should be able to represent Restaurant locations and Appleton tower and longitude and latitude coordinates.**
>
> **The drone should be considered to be close to a location if it is within 0.00015 degrees to it.**
>
> **Each move that the drone makes should be of distance 0.00015 degrees and it can move in one of the 16 tertiary compass directions.**
>
> **The drone should "hover" whenever it has arrived at a restaurant or at Appleton.**

All of these requirements are also to do with the drones routing, however separately these requirements would be considered unit level requirements and can be checked individually either manually or using unit tests. All together they would form a larger integration level requirement and testing would have to be done about how these components interact with one another.

The system must receive dynamic data from the REST-service to avoid this data from being hardcoded.

Rest data will be fetched from the REST API every time the system is started.

The system must record the drones flightpaths for each day in three different JSON-format files.

These requirements are all integration level requirements, the communication between different functions and classes would be needed. The REST service would be required to work with classes written in the system code, and the file generation would have to work with the data created by the functions responsible for computing the drones flightpath.

The drone should deliver one order at a time, with an order consisting of a maximum of 4 pizzas.

The system must ensure that the orders coming in are valid and if they are not, they will not be carried out. The system will go through each order when it is placed and check if all aspects of the order are valid such as an acceptable order date and of the restaurant is available on the day of the order. If the order is invalid, it will indicate this with an error message and this order will not be placed.

Both of these requirements are to do with order validation. The individual validations such as checking that the CVV is three digits long or checking that the order date is in a correct date format are unit level requirements, and can be tested individually from the whole system using unit testing. However, when they all combine to check whether or not an order is valid this is an integration level requirement and the functions would need to be tested working together.

Non-functional requirements

The non-functional requirements of the Pizza Dronz project can all be thought of as system level requirements, but that does not mean that they will not affect unit and integration level requirements. For instance, the non-functional requirements relating to the programs efficiency will likely concern the integration of different algorithms to achieve this. Additionally, the requirement concerning routing drones over buildings to avoid harm in case of a mechanical fault will possibly affect unit level requirements about the height the drone should fly at to achieve this.