

# GROUP PROJECT DESCRIPTION:

## *UniHaven and the UniHaven CEDARS Extension*

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### **Background:**

Many non-local undergraduate and post-graduate students at the University of Hong Kong and other universities have commented on the difficulty of finding suitable off-campus rented accommodation. They feel the university could offer more support to students who prefer not to live in residential halls or colleges.

Your company sees an opportunity to offer such a web-service, *UniHaven*, to universities in return for a small commission charged on each rental contract. Participating universities, including those who send students to Hong Kong on exchange, could integrate the service into their Student Resources sites to help students find off-campus accommodation. CEDARS at The University of Hong Kong has shown an immediate interest in the product and, in exchange for your help with integration, is willing to serve as an early adopter. You welcome this since understanding the needs of CEDARS will help you determine the services that *UniHaven* should export through its API.

Thus there are two parts to the project. Your group is responsible for both of them:

- Develop and release *UniHaven* in the form of a Minimum Marketable Product.
- Plan and design an extension to CEDAR's Accommodation Service to offer *UniHaven* services to HKU students.

*UniHaven* will initially serve the needs of HKU, but will be expanded later to cover all universities in Hong Kong. Your company envisions that similar opportunities exist in other university towns throughout the world which may lead it to develop *UniHaven Shanghai*, *UniHaven London*, etc. To ease this process, the company wants it to be straightforward to configure location-specific aspects of *UniHaven*, such as the 3<sup>rd</sup> party Location Service it uses,

[Note: To make it feasible to complete this work as a short course project, many aspects of the service, the data it manages, and the CEDARS enhancement have been reduced and simplified. Don't be distracted by that – your task is to develop the simplified product as described.]

### **UniHaven CEDARS Extension**

Currently, CEDARS offers a very basic Accommodation Service:

<https://w2.cedars.hku.hk/accomRental/main.php>

It wishes to use *UniHaven* services to support various steps in a new, more comprehensive workflow. The workflow will also include a number of manual steps.

Briefly, the new workflow is as follows: owners of properties send details of accommodation they wish to offer for lease. After inspecting the accommodation and determining it is suitable, a CEDARS specialist uploads its details to *UniHaven*, together with details of the owner.

A member of HKU seeking accommodation searches via the CEDARS site and may make a reservation. *UniHaven* alerts the specialist team when a reservation has been made and the team manages the signing of contracts and other bureaucratic details. If the member decides not to proceed with the reservation, they may cancel it and the specialist team will be informed. CEDARS specialists can also cancel a reservation if, for example, it fails at the contract stage.

Summary of needs:

**a) For members of HKU**

- Search and view a list of accommodation offered in Hong Kong matching their criteria for:
  - Type
  - Period of availability
  - Number of beds
  - Number of bedrooms
  - Price
  - Distance from a selected HKU campus or premises (with results displayed in increasing order of distance)
- Select and view details of accommodation
- Select and reserve accommodation
- Cancel a reservation before exchange of contracts
- After the end of contract, rate the accommodation on a 6 point scale of 0-5

**b) For CEDARS Accommodation Specialists**

- Add accommodation submitted together with associated details
- Receive notification of reservations and cancellations
- Cancel reservations as needed

**UniHaven**

Clearly, *UniHaven* will need to maintain additional data to support the above workflow. It is your responsibility to analyse what is needed and also to design a suitable API. There are some specific requirements, however:

- To calculate distances between offered accommodation and HKU campuses and premises, you must record latitude and longitude for all locations. You will obtain these by querying the DATA.GOV.HK Address Lookup Service with a building name. Details of the service's APIs and Data Dictionary are here:

[https://data.gov.hk/en-data/dataset/hk-dpo-als\\_01-als](https://data.gov.hk/en-data/dataset/hk-dpo-als_01-als)

You must also obtain and record the GeoAddress that uniquely identifies the location. Examples will be given in class. You will be provided with the latitude and longitude of HKU campuses and premises.

- Since distances are small, there is no need to calculate them as great-circle distances; – line of sight distances are sufficient. You can use an equirectangular projection and simple geometry to calculate them. The relevant formula is here (scroll down to “Equirectangular approximation”):

<http://www.movable-type.co.uk/scripts/latlong.html>

In future work, a 3<sup>rd</sup> party service will be used to obtain travel distance rather than line of sight distance.

## General assumptions and other information

You may assume that:

- the first result provided by the Address Lookup Service will be for the correct location unless it fails with a non-200 status code. Thus you may set the input parameter “n” to 1 (that is, return a single record). This is to avoid the need for a user to select from a number of candidates, since you won’t be implementing a UI for the CEDARS extension;
- you are unable to use the simpler HK1980 Grid Coordinates for a location because of the future need to use latitude and longitude to obtain travel distance between locations;
- CEDARS staff and members of HKU will act in a disciplined way. For instance, staff will never fail to cancel a reservation if it fails at the exchange of contracts stage;
- when a user updates data, there is no need to reflect that change immediately to other users who, for example, may be viewing the data;
- you will not be required to implement the CEDARS extension. We’ve found that many students find it too demanding to deliver functioning UIs on top of mastering Django and REST API development. You will, however, be required to design and prototype those UIs during the project;
- all users of the CEDARS extension will have been authenticated and identified as is currently the case for users of the Accommodation Service;
- you can expect changes and extensions to requirements over the course of development.

## Technical issues

- *UniHaven* will be implemented in Python on Django 5.0 (any release);
- There is no constraint on choice of OS;
- You will develop locally, running on the Django default development server.