Car Park NF

Functional Requirements

1. General
    a. The system must be able to display a map with locations of carparks.
    ~~The system must be able to show the current location of the user.~~

2. Search
    a. The system must allow user to search for a ~~destination~~location.
        i. The user must be able to search for a ~~destination~~ location by entering a 6-digit postal code or a street name.
        ii. The system must be able to display on the map the carparks within a radius of 1 km of the searched location.
        ~~ii.~~iii. The system must be able to ~~display~~ recommend a list of carparks within a radius of 1 km of the searched ~~destination~~location.
            1. Each carpark in the list of carparks displayed must contain information related to that carpark.
                a. Information includes:
                    i. Carpark number
                    ii. Carpark address
                    iii. Carpark availability
        iv. The user must be able to filter the list of carparks by vehicle types. — Formatted
            1. The vehicle types that the carparks can be filtered by include: — Formatted
                a. Car — Formatted
                b. Motorcycle
                ~~b.~~c. Heavy vehicles

3. Favourite
    a. The user must be able to favourite carparks.
    b. The user must be able to view a list of their favourite carparks.
        i. Each carpark in the list of favourite carparks must contain information related to that carpark.
            1. Information includes:
                a. Carpark number
                b. Carpark address
                c. Carpark availability
    c. The user must be able to remove a favourited carpark.

4. Select carpark to visit
    a. The user must be able to select a carpark to visit from his/her list of favourite carparks or list of carparks from searching for a destination.
        i. The system shall notify the user when the selected carpark's availability drops below 5.

ii. The system must be able to get the carpark rates of the selected carpark.

~~i.~~

~~ii. The system must be able to recognise that the user has arrived at the carpark if his current location is within a 1 km radius of the carpark location.~~

b. The user must be able to unselect a carpark that he/she has selected to visit.

5. Retrieve carpark availability information
    a. The system must be able to retrieve carpark availability information via Data.gov.sg's Carpark Availability API.
        i. Information includes:
            1. Carpark number
            2. Carpark availability

6. Retrieve carpark information
    a. The system must be able to retrieve a carpark's information using the carpark number by using the list of HDB Carpark Information by Data.gov.sg.
        i. Carpark's information includes:
            1. Carpark address
            2. Carpark's X Coord
            3. Carpark's Y Coord

7. Locations
    a. The system must be able to retrieve locations via G~~eolocation~~oogle Maps API.
        i. Locations include:
            1. Location of carparks
            ~~2. Current location of user~~
            2. With respect to functional requirement 2(a), a searched location
            3. With respect to functional requirement 2(a)(ii), 1 km radius of a searched location
            4. Location of user
    b. With respect to functional requirement 7(a)(i)(4), the location of user shall be retrieved from the user's device GPS module.

8. Navigation
    a. The user must be able to search for a route to a selected carpark.
    b. The system must be able to display the route searched for by the user on the map.

9. Carpark rates
    ~~8.~~a. The system must be able to retrieve carpark rates for user's selected carpark from the URA API.

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~~1. With respect to functional requirement 4(a)(ii), 1 km radius of a carpark the user selected to visit~~

Non-functional Requirements

1. Usability requirements
    a. The system and user must have internet connection.
    b. With respect to functional requirement 3(a), the user must be allowed to favourite a carpark by clicking on a star icon.
        i. To keep the user interface simple and easy to understand.

2. Reliability requirements
    a. The system must update the carpark availability information every 1 minute.
    b. After a system reboot, the full system functionality must be restored within 5 minutes.

3. Performance requirements
    a. The system must not crash when the user opens the application.
    b. The user must be able to use the application within 20~~15~~ seconds of opening the application.
    c. With respect to functional requirement 2(a), the system must be able to return the search results to the user within 10~~5~~ seconds.

4. Supportability requirements
    a. The user must be able to access the application from ~~any~~ web browsers on their mobile device.

Data Dictionary

Term	Definition
System / application	The Car Park NF web application.
User	A person using the application to find carpark locations and carpark availability.
Map	An interactive map of Singapore.
Location	A point on the map of a particular place or building.
Search	A feature of the application that allows users to find carparks within a ~~specified~~ 1km radius of his/her ~~queried destination~~searched location.
Favourite	A feature of the application that allows users to favourite, view favourited, or remove carparks for future ease of reference.
~~Destination~~	~~A location which a user wants to go to.~~
6-digit postal code	A 6-digit postal code representing an address of a location.
Street name	Name of a location.
Carpark number	A 5-digit carpark code.
Carpark availability	Number of remaining free lots in a carpark.
Carpark availability information	Information retrieved from Carpark Availability API which consists of, among other things, carpark number and carpark availability.
~~Favourite~~	~~A feature of the application that allows users to favourite, view favourited, or remove carparks for future ease of reference.~~
Carpark Availability API	API provided by Data.gov.sg that gives information on the latest carpark availability in Singapore.
Carpark('s) information	A carpark's information retrieved from HDB Carpark Information based on the carpark's carpark number, which consists of, among other things, carpark address, Carpark's X Coord and Y Coord.
HDB Carpark Information	Data provided by Data.gov.sg that gives information about HDB carparks.
Carpark's X Coord and Y Coord	Geo coordinate X and geo coordinate Y respectively of the carpark, indicating the carpark's location on the map.
Google Maps API	An API that allows developers to access Google Maps data and functionality
Route	A path from the location of user to a selected carpark.
~~Geolocation API~~	~~A service by Google Maps platform to locate mobile devices that do not provide native geolocation features.~~

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