

Car Park NF

Functional Requirements

1. General
 - a. The system must be able to display a map with locations of carpark.
2. Search
 - a. The system must allow user to search for a location.
 - i. The user must be able to search for a location by entering a 6-digit postal code or a street name.
 - ii. The system must be able to display on the map the carpark within a radius of 1 km of the searched location.
 - iii. The system must be able to recommend a list of carpark within a radius of 1 km of the searched location.
 1. Each carpark in the list of carpark 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 carpark by vehicle types.
 1. The vehicle types that the carpark can be filtered by include:
 - a. Car
 - b. Motorcycle
 - c. Heavy vehicles
3. Favourite
 - a. The user must be able to favourite carpark.
 - b. The user must be able to view a list of their favourite carpark.
 - i. Each carpark in the list of favourite carpark 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 carpark or list of carpark 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.

- 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 Google Maps API.
 - i. Locations include:
 - 1. Location of carpark
 - 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
 - a. The system must be able to retrieve carpark rates for user's selected carpark from the URA API.

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 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 seconds.

4. Supportability requirements

- a. The user must be able to access the application from 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 1km radius of his/her searched location.
Favourite	A feature of the application that allows users to favourite, view favourited, or remove carparks for future ease of reference.
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.
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.