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| --- | --- | --- | --- |
| User Case ID | 01 | | |
| Use Case Name | Search & Filter | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 03/09/2023 | Date Last Updated | 08/09/2023 |

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| --- | --- |
| Actor | User, Google Map API |
| Description | This use case involves searching for carparks based on location, distance, and availability. |
| Preconditions | * Location services are enabled * User has network connectivity |
| Postconditions | * Carpark results displayed * Map display updated |
| Priority | High |
| Frequency of Use | High |
| Flow of Events | 1. User opens app 2. System displays map with preferred search radius 3. System initiates search with either user current location or user keyed location 4. Google Map API checks for list of carparks within search radius 5. System displays results on map as markers |
| Alternative Flows | NIL |
| Exceptions | User turned off GPS location services   1. System will prompt user to turn on location services   Invalid Carpark API response   1. System displays “Carpark information currently unavailable” |
| Includes | View Map, Search Radius, Obtain Carpark Details, Obtain Favourites |
| Special Requirements | Results be displayed in a way that users can find available parking in no more than 2 steps |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 02 | | |
| Use Case Name | Manual Location Input | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 03/09/2023 | Date Last Updated | 08/09/2023 |

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| --- | --- |
| Actor | User, Google Maps API |
| Description | This use case allows the user to manually input a location |
| Preconditions | * User presses the search bar |
| Postconditions | * User presses enter |
| Priority | Medium |
| Frequency of Use | Medium |
| Flow of Events | 1. User press on search bar 2. User keys in location 3. Google Map API gives list of possible intended locations (Auto-complete) 4. User enters desired location 5. System initiates Search and Filter use case |
| Alternative Flows | User keys in an unknown location   1. System displays “Location Not Found”   User keys in a location out of Singapore   1. System displays “Invalid Location” |
| Exceptions | Invalid Google Map API response   1. System displays “Map information currently unavailable” |
| Includes | NIL |
| Special Requirements | NIL |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 03 | | |
| Use Case Name | Filter Preferences | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 03/09/2023 | Date Last Updated | 12/09/2023 |

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| Actor | User, Database |
| Description | Users can set a preferred search radius (e.g. 1 km, 5 km) for nearby carparks and in terms of their carpark availability. |
| Preconditions | * User presses filter icon on search bar |
| Postconditions | * New filter preferences has been set |
| Priority | High |
| Frequency of Use | Low |
| Flow of Events | 1. System displays results based on previous filters 2. User press filter icon 3. User updates filter preferences 4. System updates filter preferences in the Database 5. System filters current results according to new preferences |
| Alternative Flows | Resetting to Default:   1. From step 2, user press reset default 2. System reset filter preferences to original   No carpark found in filter parameters:   1. Display empty map 2. System displays “No Carpark Found” |
| Exceptions | NIL |
| Includes | NIL |
| Special Requirements | * User must be able to adjust search radius with a slider or drop-down list * Limit the filter preferences to a max and min value |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 04 | | |
| Use Case Name | Pinpoint Car Location on Map | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 03/09/2023 | Date Last Updated | 08/09/2023 |

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| --- | --- |
| Actor | User, Database |
| Description | Users can pinpoint their car’s location on the map |
| Preconditions | * User pins location as car location |
| Postconditions | * Car location displayed on map * Car location unpinned by user |
| Priority | Low |
| Frequency of Use | Medium |
| Flow of Events | 1. User reaches carpark 2. User presses pin car location button 3. System prompts for carpark slot details 4. User enters parking slot details 5. System saves entered information to the Database 6. System marks car location and slot details |
| Alternative Flows | If pin car button has already been pressed   1. After step 2, System confirms user request to unmark car location 2. System will unmark the car location and remove any previously entered details upon confirmation |
| Exceptions | NIL |
| Includes | NIL |
| Special Requirements | Size of pin-point marker should be small and visible enough to indicate the correct carpark when there are multiple carparks in the same vicinity |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 05 | | |
| Use Case Name | Mark Favorite Carparks | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 08/09/2023 | Date Last Updated | 08/09/2023 |

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| --- | --- |
| Actor | User, Database |
| Description | Users can bookmark their handpicked carparks |
| Preconditions | * Users pressed favourite icon on specific carparks |
| Postconditions | * Carparks marked as favourite |
| Priority | Low |
| Frequency of Use | Low |
| Flow of Events | 1. User press on carpark bubble 2. User press star icon 3. System sends request to database 4. Database saves carpark to user’s favourites |
| Alternative Flows | If the carpark is already a favourite of the user   1. After step 4, Database remove carpark from user’s favourites |
| Exceptions | NIL |
| Includes | NIL |
| Special Requirements | NIL |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 06 | | |
| Use Case Name | Obtain Favourite | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 08/09/2023 | Date Last Updated | 08/09/2023 |

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| --- | --- |
| Actor | User, Database |
| Description | Users can view their favourite carparks |
| Preconditions | * Search and Filter was initiated * Users pressed favourite option in menu |
| Postconditions | * Search and Filter completes * Favourites list displayed |
| Priority | Low |
| Frequency of Use | Low |
| Flow of Events | 1. Search and Filter initiated 2. System request user’s favourites from Database 3. Database sends user’s favourites |
| Alternative Flows | 1. User navigates to the favourites page 2. Continues with steps 2 and 3   If user has no favourites   1. System displays “No favourites available”   Else   1. System displays favourites list |
| Exceptions | NIL |
| Includes | NIL |
| Special Requirements | NIL |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 07 | | |
| Use Case Name | Obtain History | | |
| Created By | Chee Han | Last Updated by | Chee Han |
| Date Created | 08/09/2023 | Date Last Updated | 08/09/2023 |

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| --- | --- |
| Actor | User, Database |
| Description | User can view their parking transaction history |
| Preconditions | * User navigates to history page |
| Postconditions | * User’s parking cost history is displayed |
| Priority | Low |
| Frequency of Use | Low |
| Flow of Events | 1. User goes to history page 2. System requests Database for user’s parking history 3. Database sends user’s parking history 4. System display user parking cost history |
| Alternative Flows | If user does not have a history yet   1. Database send not found 2. System displays “No Parking History” |
| Exceptions | NIL |
| Includes | NIL |
| Special Requirements | Database needs to save user history from past 3 months |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 08 | | |
| Use Case Name | View Map | | |
| Created By | Arjun | Last Updated by | Arjun |
| Date Created | 03/09/2023 | Date Last Updated | 03/09/2023 |

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| --- | --- |
| Actor | User, Google Maps API |
| Description | Display of carpark locations and availability of carpark slots within the map. |
| Preconditions | User launches app |
| Postconditions | * Show the nearest carparks to the user’s location * Show the availability of carpark slots in those nearby carparks |
| Priority | High |
| Frequency of Use | High |
| Flow of Events | 1. User launches app 2. System initiates Search & Filter 3. System display results on map |
| Alternative Flows | NIL |
| Exceptions | Invalid Google Map API response   1. Grey map out 2. System displays “Map information currently unavailable”   Invalid Carpark API response   1. System displays “Carpark information currently unavailable” |
| Includes | NIL |
| Special Requirements | * Map view must be compatible with a variety of devices and screen sizes * Icons on the map must be visible for everyone |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

|  |  |  |  |
| --- | --- | --- | --- |
| User Case ID | 09 | | |
| Use Case Name | Obtain Directions | | |
| Created By | Arjun | Last Updated by | Chee Han |
| Date Created | 03/09/2023 | Date Last Updated | 08/09/2023 |

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| Actor | Google Maps API |
| Description | Uses the google maps API to obtain the directions to the carpark that the user has chosen. |
| Preconditions | User clicks on the carpark that he has chosen. |
| Postconditions | The map shows the directions to the carpark that the user has chosen |
| Priority | Medium |
| Frequency of Use | High |
| Flow of Events | 1. User press on ‘Go Here!’ 2. Google API obtains relevant directions from current location to carpark |
| Alternative Flows | NIL |
| Exceptions | User has turned off GPS location services   1. System will prompt “Turn on location services”   Invalid Google Maps API response   1. System displays “Directions currently unavailable” |
| Includes | NIL |
| Special Requirements | Travelling time and distance should be calculated and updated in real-time |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

| User Case ID | 10 | | |
| --- | --- | --- | --- |
| Use Case Name | Obtain Carpark Details | | |
| Created By | Arjun | Last Updated by | Arjun |
| Date Created | 03/09/2023 | Date Last Updated | 07/09/2023 |

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| --- | --- |
| Actor | Carpark APIs |
| Description | The carpark details are retrieved by the Carpark APIs |
| Preconditions | User clicks on the carpark bubble |
| Postconditions | The carpark details are retrieved by the Carpark APIs |
| Priority | High |
| Frequency of Use | High |
| Flow of Events | 1. System initiates Search & Filter 2. Carpark API obtains relevant carpark details 3. Update colour of carpark bubble on map based on availability 4. User presses on carpark bubble 5. System shows carpark details |
| Alternative Flows | NIL |
| Exceptions | Invalid Carpark API response   1. System displays “Carpark information currently unavailable” |
| Includes | Slot Type, Carpark Slot Availability, Total Slots |
| Special Requirements | To be initiated every 60 seconds |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

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| --- | --- | --- | --- |
| User Case ID | 11 | | |
| Use Case Name | Carpark Slot Availability | | |
| Created By | Aaron | Last Updated by | Aaron |
| Date Created | 03/09/2023 | Date Last Updated | 05/09/2023 |

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| --- | --- |
| Actor | Carpark APIs |
| Description | The carpark APIs provides the number of carpark lots available in the carpark for all carparks in the API. |
| Preconditions | System initiates Search & Filter. |
| Postconditions | The number of carpark slots available in the selected carpark would be displayed on the user interface. |
| Priority | High |
| Frequency of Use | High |
| Flow of Events | 1. Search & Filter initiates Obtain Carpark Details 2. Carpark API retrieves carpark slot availability |
| Alternative Flows | NIL |
| Exceptions | Invalid Carpark API response   1. System displays “Carpark information currently unavailable” |
| Includes | NIL |
| Special Requirements | To be initiated every 60 seconds |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

|  |  |  |  |
| --- | --- | --- | --- |
| User Case ID | 12 | | |
| Use Case Name | Slot Type | | |
| Created By | Aaron | Last Updated by | Aaron |
| Date Created | 03/09/2023 | Date Last Updated | 05/09/2023 |

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| --- | --- |
| Actor | Carpark APIs |
| Description | There are primarily 3 different types of carpark slots in a carpark depending on the type of vehicle, i.e. cars, motorcycles, lorries/trucks. |
| Preconditions | System initiates Search & Filter. |
| Postconditions | Results of the carpark type availability would be shown on the user interface. |
| Priority | Medium |
| Frequency of Use | High |
| Flow of Events | 1. Search & Filter initiates Obtain Carpark Details 2. Carpark API retrieves slot type |
| Alternative Flows | NIL |
| Exceptions | If slot type is not found, System indicate “Unavailable”  Invalid Carpark API response   1. System displays “Carpark information currently unavailable” |
| Includes | NIL |
| Special Requirements | To be initiated every 60 seconds |
| Assumptions | User has a stable network connection |
| Notes and Issues | NIL |

|  |  |  |  |
| --- | --- | --- | --- |
| User Case ID | 13 | | |
| Use Case Name | Current Location | | |
| Created By | Pranav | Last Updated by | Pranav |
| Date Created | 16/09/2023 | Date Last Updated | 16/09/2023 |

|  |  |
| --- | --- |
| Actor | User |
| Description | On clicking the current location button, the map view is reset to show the current location of the user. |
| Preconditions | The user has moved around the map to view different location, and click the current location button. |
| Postconditions | The map shows the current location of the user. |
| Priority | High |
| Frequency of Use | High |
| Flow of Events | 1. The user clicks the button. 2. The app fetches current user location and moves the map perspective accordingly. |
| Alternative Flows | NIL |
| Exceptions | NIL |
| Includes | View Map |
| Special Requirements | NIL |
| Assumptions | User has stable network connection and has location services turned on. |
| Notes and Issues | NIL |

|  |  |  |  |
| --- | --- | --- | --- |
| User Case ID | 14 | | |
| Use Case Name | View Parked Car Location | | |
| Created By | Pranav Parashar | Last Updated by | Pranav Parashar |
| Date Created | 16/09/2023 | Date Last Updated | 16/09/2023 |

|  |  |
| --- | --- |
| Actor | User, Database |
| Description | On clicking the view parked car button, the map view moves to show the location of the parked car. |
| Preconditions | The user is viewing a different location. |
| Postconditions | The map shows the parked car on the map. |
| Priority | High |
| Frequency of Use | High |
| Flow of Events | 1. The user clicks the necessary button. 2. The app fetches the marked car location and shows it on the map. |
| Alternative Flows | 1. If there is no parked car marked previously, it shows a dialogue box stating, “No location marked” |
| Exceptions | NIL |
| Includes | View Map |
| Special Requirements | NIL |
| Assumptions | User has stable network connection. |
| Notes and Issues | NIL |

|  |  |  |  |
| --- | --- | --- | --- |
| User Case ID | 15 | | |
| Use Case Name | Clear History | | |
| Created By | Pranav Parshar | Last Updated by | Pranav Parashar |
| Date Created | 16/09/2023 | Date Last Updated | 16/09/2023 |

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| --- | --- |
| Actor | User, Database |
| Description | The app clears history data of more than 3 months or the user can manually choose to do the same before that. |
| Preconditions | History is stored in the database. |
| Postconditions | History is cleared. |
| Priority | Medium |
| Frequency of Use | Low |
| Flow of Events | 1. User clicks clear history button. 2. The history gets deleted from the database. |
| Alternative Flows | 1. If the history is of more than 3 months, it gets deleted automatically. 2. Or, if there is no history to show, on clicking the button, a dialogue box shows, “History already clear”. |
| Exceptions | NIL |
| Includes | NIL |
| Special Requirements | NIL |
| Assumptions | User has a stable internet connection. |
| Notes and Issues | NIL |