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| Use Case Name: | View Map |

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| Actor: | User |
| Preconditions: | 1. The user has a mobile phone 2. The app is installed on the mobile phone 3. The app is launched |
| Postconditions: | App is considered launched, and map is visible and interactive with all car parks shown on the map |
| Flow of Events: | 1. Launch application 2. Check if map data is downloaded and cached. If not, download and cache map. 3. If at least 1 day since last application launch, redownload and cache map data. 4. Request location data of user. 5. 1.Application fetches all the car parks in the database 6. All carpark locations are shown on the map with a pointer |
| Alternative Flows: | 1. If location setting for the device is disabled, or if the application is prevented from accessing user location, app will pop up a request for location data. 2. If user denies request, exit application. 3. If user accepts request, continue |
| Exceptions: | No map data available (Map not downloaded and user not connected to internet)  No Internet connection.  Access to API failed. |

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| Use Case Name: | Set Destination |

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| Actor: | User |
| Preconditions: | App is launched. |
| Postconditions: | Car parks near to the destination are displayed. |
| Flow of Events: | 1. The user types the name of the destination in the search bar 2. A query result is displayed, showing destinations containing the keyword as typed by the user. 3. The user selects the destination by tapping. |
| Alternative Flows: | 1. s the typo.   The user continues on back to step 1 of the flow of events. |
| Exceptions: | Location set is not a street. |

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| Use Case Name: | Query Car Parks |

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| Actor: | User |
| Preconditions: | Application is launched, car park name or code is available on the API. Map is available. |
| Postconditions: | Searched car park is shown to the user on the map. |
| Flow of Events: | 1. User input the name or code of the car park. 2. The application looks for the name or code of the car park in the API. 3. The application shows the car park to the user on the map. |
| Alternative Flows: | 1. If user enters invalid name or code of the car park. 2. The search function will try to match with the similar names and code for user to select. |
| Exceptions: | No API data available. |

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| Use Case Name: | Show Directions |

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| Actor: | N/A |
| Preconditions: | The user’s location is determined and the destination car park location is set. |
| Postconditions: | The route to the car park is shown on the map. |
| Flow of Events: | 1. The application obtains the directions through querying Google Maps API 2. The directions are stored, waiting to be displayed later. 3. The route is shown on the map as a colored line. 4. The user can optionally choose to show estimated driving time and detailed directions information. |
| Alternative Flows: | N/A |
| Exceptions: | No Internet connection.  Access to Google Maps API has failed. |

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| Use Case Name: | Get Nearest Car Parks |

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| Actor: | User |
| Preconditions: | The user location is determined.  API of car park is available.. |
| Postconditions: | Nearest car parks will be shown on the map. |
| Flow of Events: | 1. Application calculates the nearest car parks. 2. Application displays all the nearest car park available on the map. 3. User is allowed to select the car park they want to park at. |
| Alternative Flows: | N/A |
| Exceptions: | API not available |

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| Use Case Name: | Save/Load Destination and Directions |

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| Actor: | User |
| Preconditions: | The route is displayed on the map.  User has opened Favorite routes |
| Postconditions: | Saved directions is added into the favorites section |
| Flow of Events: | 1. User clicks Save route button 2. User sets up time and days for notification 3. Route is added into the database 4. User opens Favorite routes window 5. Selects route from saved routes 6. Route is loaded to the screen |
| Alternative Flows: | 1. The user does not enter valid timing information before saving a route. 2. An error message pops up. 3. The application requests the user to allow it to access files on the mobile device. 4. Once granted access, the application will continue onto Step 3. Otherwise, the application will not save the route, and warn the user that the route has not been saved. |
| Exceptions: | Out of storage space.  No permissions granted to application to save or load data.  No saved routes exist |

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| Use Case Name: | Rate Car Park |

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| Actor: | User |
| Preconditions: | User is viewing car park details. |
| Postconditions: | The rating is added to the car parkCar park's rating is updated |
| Flow of Events: | 1. The user gives a rating and comment to the carpark. 2. The car park's new average rate is recalculated 3. New average rating is displayed |
| Alternative Flows: | 1. No rating is provided. 2. Error message pops up. 3. The application requests the user to allow it to access files on the mobile device. 4. Once granted access, the application will continue onto Step 3. Otherwise, the application will not save the route, and warn the user that the route has not been saved. |
| Exceptions: | No internet connection. Out of storage  No permissions granted to application to save or load data. |