Function

Must have

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| Summary | Action |
| Search for bus stops | The user will input the name of the bus stop and then displayed on the screen will be the closest matching bus stops that the uni bus stops at ranked in order of which bus stop names have the most adjacent matching letters in the right order to the name entered by the user. Only bus stops that have at least 3 matching adjacent letters will be displayed. All letters will first be turned to lower case for the purpose of this ranking. E.g. if the user entered “Cannon street” and there is a bus stop named “cannon street” then it will be ranked highest due to every letter matching, however if the user input “teerts nonnaC” then the bus stop “Cannon street” would not match every letter even though Cannon street is just teerts nonnaC backwards due to the order needing to be preserved so the best match between teerts nonnaC and Cannon street is the double “e” and double “n” making 2 matching letters. |
| Display bus timetable | The app will display a table containing every bus stop and then every time of the day that the uni bus stops at that bus stop. |
| Display bus stops on a map | The app will display a map, similar to google maps or bing maps, and on that map it will display a marker at the location of every bus stop that the uni bus stops at. |
| Displays Landmarks on map | The app will display a map, similar to google maps or bing maps, and on that map it will display a marker at the location of every landmark that we have chosen to include. |
| Displays Uni buildings on map | The app will display a map, similar to google maps or bing maps, and on that map it will display a marker at the location of every Portsmouth university building that we have chosen to include. |

Should have

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| Summary | Action |
| ETA on Timetable | On the bus timetable next to the times that the bus will arrive at each stop, the amount of time until it is that time should be displayed in minutes along with the word minutes. This should only be displayed for times that have not yet past that day, as in it should not give an eta for a bus that will arrive tomorrow. E.g. bus arrives at 5:50pm, current time is 5:40pm so it should display “10 minutes” |
| Click on bus stop to get eta for that stop | When a user clicks on a bus stop, whether through the map or the search menu, the app should display the ETA in minutes for the remaining times that day that a bus will stop at that bus stop. This is similar to how an eta is displayed on the timetable except it is only displaying the info for the chosen bus stop. |
| Click on bus stop to get the bus times for that stop | When a user clicks on a bus stop, whether through the map or the search menu, the app should display the timetable for that bus stop. As in it should display the times that a uni bus stops at that bus stop. This is similar to the timetable except it is only displaying the info for the chosen bus stop. |
| Displays your current location on map | The app will display a map, similar to google maps or bing maps, and on that map it will display a marker at your current location if the app has been given permission to access your current location |
| Search for uni buildings | The user will input the name of the university building and then displayed on the screen will be the closest matching Portsmouth university buildings ranked in order of which university building names have the most adjacent matching letters in the right order to the name entered by the user. Only university buildings that have at least 3 matching adjacent letters will be displayed. All letters will first be turned to lower case for the purpose of this ranking. This is the same algorithm that will be used to search for bus stops. |
|  | The user will input the name of the landmark and then displayed on the screen will be the closest matching landmarks ranked in order of which landmark names have the most adjacent matching letters in the right order to the name entered by the user. Only landmarks that have at least 3 matching adjacent letters will be displayed. All letters will first be turned to lower case for the purpose of this ranking.  This is the same algorithm that will be used to search for bus stops. |
| Timetable eta’s should update | When the user is viewing the timetable the ETA’s displayed should update once every minute. Since the ETA’s will be displayed in minutes this just means that they should all decrease by 1 when this update happens. For ETA’s that would go below zero, meaning the time that that bus is supposed to stop at that bus stop in that day has now passed, the eta is removed. |
| User login | The user should be able to login using there email and chosen password. |
| User register | The user should be able to register for an account using their email and their chosen password. |
| Saved recently viewed bus stops, landmarks and uni buildings. | User that are using a registered account will save the 5 most recently viewed bus stops, landmarks and uni buildings that the user accessed. This means the 5 most recently viewed bus stops, the 5 most recently viewed landmarks, and the 5 most recently viewed university buildings. |
| Recently viewed bus stops to be displayed back to the user. | When a user using a registered account clicks to open the search function for the bus stops, before the user types anything, their 5 most recently viewed bus stops will be displayed. Once the user types at least 3 characters into the search function these recently viewed bus stops will be replaced by the search results. Once the number of characters in the search function has dropped below 3, the recently viewed bus stops will reappear. |
| Recently viewed landmarks to be displayed back to the user. | When a user using a registered account clicks to open the search function for the landmarks, before the user types anything, their 5 most recently viewed landmarks will be displayed. Once the user types at least 3 characters into the search function these recently viewed landmarks will be replaced by the search results. Once the number of characters in the search function has dropped below 3, the recently viewed landmarks will reappear. This is similar to the recently viewed bus stops. |
| Recently viewed university buildings to be displayed back to the user. | When a user using a registered account clicks to open the search function for the university buildings, before the user types anything, their 5 most recently viewed university buildings will be displayed. Once the user types at least 3 characters into the search function these recently viewed university buildings will be replaced by the search results. Once the number of characters in the search function has dropped below 3, the recently viewed university buildings will reappear. This is similar to the recently viewed bus stops. |

Could have

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| Summary | Action |
| Wayfinding from location to bus stops for walking | A route will be displayed on the map from the users current location to the chosen bus stop that the university bus stops at. The route displayed will use paths and roads that a person can walk along. |
| Wayfinding to uni buildings | A route will be displayed on the map from the users current location to the chosen Portsmouth university building. The route displayed will use paths and roads that a person can walk along. This is similar to wayfinding to the university bus stops. |
| Wayfinding to landmarks | A route will be displayed on the map from the users current location to the chosen landmark. The route displayed will use paths and roads that a person can walk along. This is similar to wayfinding to the university bus stops. |
| Walking distance along route | The distance that the route will need the user to walk will be displayed in kilometres. |
| Eta for walking route | The estimated time that the route will take to walk will be displayed in minutes. This will be calculated using the UK average walking speed of 5 kilometres per hour. |
| Making part of the route to the destination be taking the university bus. | The route mentioned in the previous requirements will now include taking the university bus where needed. This means that the route will direct the user to the bus stop along the route, then it will instruct the user to take the university bus and will display the part of the route done by the bus on the map in a different colour. Then the app will instruct the user at which bus stop the need to get off the university bus. Then the walking route will continue. |
| Eta for entire route | The estimated time that the user will finish the route. The walking parts will be estimated using the UK average walking speed of 5 kilometres per hour. |
| Let the user choose between multiple routes | When the user chooses selects a destination that they want a route to, if there is a difference, let them choose between the shortest distance walked and the fastest route. There may be a difference for example if the route tells the user to take the bus for the least walked route however there might be a long wait time for the bus making it faster to walk. |

Non-Functional

Must have

* Our use of openlayers map will comply with there licence agreement
* The timetable should be available 24 hours a day

Should have

* App will be available on Android 13, 12 and 11
* App will be available on IOS 16, 15 and 14
* Eta on timetable should update at least once per minute
* The map should be available whenever openlayers map is available

Could have

* Wayfinding time eta’s should update at least once per minute
* Wayfinding distance eta’s should update at least once per minute