# Functional requirements:

# User:

# Service contracts:

1. Service GIS request
2. Get XYZ coordinates of a named location
3. Add GIS information
4. Add a location with coordinates to the system
5. Modify GIS information
6. Remove GIS information
7. Update GIS Map
8. Modify GIS Map

| Functional Requirements | Mark (10) |
| --- | --- |
| Service GIS Request | 7 |
| Add GIS information | 5 |
| Modify GIS information | 0 |
| Remove GIS information | 10 |
| Update GIS Map | 6 |
| Modify GIS Map | 0 |

# Case 1: Service GIS request

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Location | string | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |

## Test case generation/use case based test:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test case | Location | Valid | Expected result | Actual result |
| 1 | Get Current Location | Valid | Receive coordinates of current location | Receive default coordinates |
| 2 | EMB | Valid | Receive coordinates of EMB building | Receive coordinates of EMB building |
| 3 | IT Building | Valid | Receive coordinates of IT building | Receive coordinates in path in front of IT building, inaccurate coordinates. |
| 4 | Amphitheatre | Valid | Receive coordinates of Amphitheatre | Receive coordinates in path in front of Amphitheatre, inaccurate coordinates. |
| 5 | Chapel | Valid | Receive coordinates of Chapel building | Receive coordinates in path in front of Chapel building, inaccurate coordinates. |
| 6 | Engineering1 | Valid | Receive coordinates of Engineering1 building | Receive coordinates in path in front of Engineering1 building, inaccurate coordinates. |

* There is no method to only access a location. In order to see where the EMB building is for example, one has to navigate there from the current position or another location.
* The coordinates given are not accurate. One expects the coordinates of a building to represent the centre of that building not the area in front of it.

# Case 2: Add GIS information

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Location Name | String | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |
| Coordinates | integer | X and Y coordinates of the location separated by a , | Satisfies value specification | Does not satisfy value specification | None |

## Test case generation/use case based test:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test case | Name | Valid | Coordinates | Valid | Expected result | Actual result |
| 1 | UP Arts Building | Valid | -25.755730, 28.227820 | Valid | Message that the location has been added to the GIS database | Message that the location has been added to the GIS database |
| 2 | Merissa’s Location | Valid | 0,0 | Valid | Message that the location has been added to the GIS database | Message that the location has been added to the GIS database |
| 3 | 1234567 | Invalid | 0,1 | Valid | Message that warns about the invalid name of the location | Message that the location has been added to the GIS database |
| 4 | “” | Invalid | 1,1 | Valid | Message that warns about the invalid name of the location | Message that warns about the invalid name of the location |
| 5 | Test | Valid | “Sdsxss” | Invalid | Message that warns about the invalid coordinates | Message that warns about the invalid name of the location |
| 6 | “” | Invalid | “” | Invalid | Message that asks for input in both fields | Message that warns about the invalid name of the location |

* There is no data validation in this section. The GIS objects are saved but they can be null and contain nonsensical data. Thus making the GIS objects that are persisted essentially useless.

# Case 3: Modify GIS information

# Input values:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Input Element | Type | Value Specification | Valid | Invalid | Exceptional Cases |
| Location Name | String | Non-empty string | Satisfies value specification | Does not satisfy value specification | None |
| Coordinates | integer | X and Y coordinates of the location separated by a , | Satisfies value specification | Does not satisfy value specification | None |

## Test case generation/use case based test:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test case | Name | Valid | Coordinates | Valid | Expected result | Actual result |
| 1 Change IT Building information to: | UP Arts Building | Valid | -25.755730, 28.227820 | Valid | Message that says the information was changed. The show the changed information. | Nothing Happens |
| 2 Change EMS Building information to: | Merissa’s Location | Valid | 0,0 | Valid | Message that says the information was changed. The show the changed information. | Nothing Happens |
| 3 Change Amphitheatre information to: | 1234567 | Invalid | 0,1 | Valid | Message that warns about the invalid name and prompts the user to enter a new name | Nothing Happens |
| 4 Change chapel information to: | “” | Invalid | 1,1 | Valid | Message that prompts the user to enter a name | Nothing Happens |
| 5 Change IT Building information to: | Test | Valid | “Sdsxss” | Invalid | Message that warns the user about the invalid coordinates and prompts the user to enter valid coordinates | Nothing Happens |
| 6 Change IT Building information to: | “” | Invalid | “” | Invalid | Message that prompts the user to enter a name and coordinates | Nothing Happens |

* No data is changed or modified when the save changes button is pressed.
* There is no navigation back to the list of location information after saving changes. The user has to manually reload the page, which remains unchanged.
* This functionality seems to be completely missing.

# Case 4: Remove GIS information

# Input values:

|  |  |
| --- | --- |
| Input Element | Type |
| Click delete button | Button Click |

## Test case generation/use case based test:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test case | Button Click | Valid | Expected result | Actual result |
| 1 | yes | Valid | Display confirmation of delete message and redirect to list of locations page to show deleted content | Display confirmation of delete message and redirect to list of locations page to show deleted content |
| 2 | no | Valid | Redirect back to list of locations page | Redirect back to list of locations page |

# Case 5: Update GIS Map

# Input values:

|  |  |
| --- | --- |
| Input Element | Type |
| User interaction with map | Mouse |

## Test case generation/use case based test:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test case | Username | Valid | Expected result | Actual result |
| 1 | Click and drag map around | Valid | Map updates to new locations that it has been dragged to | Map updates to new locations that it has been dragged to |
| 2 | Click the + and – signs on the map | Valid | Map zooms in and out | Map zooms in and out |
| 3 | Walk around | Valid | Map updates the current location | Nothing happens |

# Case 6: Modify GIS Map

There is no functionality to modify the elements of the GIS map.

# Non-functional requirements:

| Non-Functional Requirements | Mark (10) |
| --- | --- |
| User Interface | 6 |
| Performance | 8 |

# Case 1: User interface

* The interface for adding GIS information is confusing. After saving the required information into the database, the information stays open and you cannot enter a new object until you refresh the page.
* There is no limit on how far the user can zoom in and out. This leaves the user fully able to see the entire world map and view other locations, which should not be able to happen in the NavUp application.
* The map can be dragged outside the boundaries of campus. This is not in the scope of the application.
* The interface for GIS data modification is confusing. The labels do not guide the user in what he or she is doing in any way.

# Case 2: Performance

|  |  |
| --- | --- |
| Functionality | Time to load (ms) |
| Navigate | 8 |
| Get Current Position | 12 |
| Calculate route | 9 |