**Research on Requirement to create a Google Map layer**

There was a requirement to create a google map layer (A simple map on HTML page) to cater following requirements.

1. To display multiple markers on the map (with different marker icons).
2. To define shapes (areas) on map using Google map drawing tools (draw polygons, circles etc.).
3. How to save / export and then import above created shapes from / to map layer.
4. Dynamically change above created map markers on map without refreshing the page.

**Tasks completed**

1. Got a free google map API from Google Cloud Platform ( <https://console.cloud.google.com/home/dashboard?project=manifest-virtue-239809&pli=1>).

* **Steps to get a free google API key** 
  + Visit to the above URL
  + Create a new project
  + After creating the project go inside that newly created project
  + Navigate to API & Services which is placed in navigation menu and click on credentials.
  + Click on create credentials
  + Select API key
  + Then a new API will be created
  + Then go to libraries to enable some services provided by google.
    - In this task I have used 3 libraries
      * Maps JavaScript API
      * Places API
      * Maps Embed API
  + Select the relevant library then click on enable
  + Do the same process when selecting other libraries
  + After selecting libraries again go to credentials and copy the API key
  + Paste it in your codebase where you want to render it

1. Created a simple Prototyped UI to Develop the required functionalities
2. Enabled the Draw

* Used DrawingManager class which provides a graphical interface for users to draw polygons, polylines, circles, and markers on the map.
* Drawing Tools is self-contained library, separated from the main ‘Map API JavaScript’ code. To use the functionality contained with this library, We must first load it Using the library parameter in the Maps API bootstrap URL:

<script async defer

src="https://maps.googleapis.com/maps/api/js?key=AIzaSyBsX21RxTZWq5E-Kj-3WLhFOy57DvUzv28&libraries=drawing&callback=drawtools">

</script>

* In this functionality was able to draw shapes like circles, rectangles, polygons, polylines and markers
* Markers are draggable
* Shapes are draggable and editable(can resize)
* Can draw multiple shapes and multiple markers on the map

1. Created a dynamically updating table

* Once user Draw a shape or a maker a row will be added to the table which is having 3 columns. They are respectively,
  + Shape Id (unique Id generated from the code it self for each shape and marker )
  + Shape Type
  + Delete Button (Once we click on this delete button the relavant shape or the marker and the row will be deleted)

1. Getting Coordinated / Exporting Shapes

* After creating a shape once we clicked on the ‘Get Coordinates’ button the latitude and longitude coordinates and the type of the shape relevant to the drawn shape will be display in a Json format.

1. Importing Shapes

* Once we give the Coordinates of a shape that shape will be drawn automatically on the map with relevant latitude and longitude values. This functionality is still working only for polylines and polygons only.

**Tasks needed to be completed**

* Detect changed position (latlong values has to be changed once the position is changed)
* Adding multiple types of markers
* Detect once marker exceed a border of drown shape and give an alert
* Importing rectangle, circle and marker

**Issues needed to be solved**

* After creating multiple shapes and tried to export the coordinates the shape type is not displaying correctly