

"Honors - Ubiquitous Computing"

"Experiment - 3"

Jenil Savla
60004200074
Div : A/K1
Computer.

Aim : To implement a context aware system.

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Theory :

Context aware systems are systems that are aware of their situation (or context) in their physical, virtual (ICT) and user environment, and can adapt the system to this in some way, benefitting from knowledge of their situation. For example, in the personal memories scenario, the camera can detect the distance of the camera to the subject of the photo and automatically adapt the focus of a camera lens when recording the image.

The term context aware was first used in 1994 by Schilit and Theimer to refer to a system that can provide context relevant information and services to users and applications. Schilit also defined a context aware system as a system that adapts itself to the context. There are many other similar definitions.

Models of context aware systems need to define what a range of contexts describe and how contexts are created,

composed and used for adaptation. Context aware system models need to define how to represent contexts in a computation form and how to support an operational life cycle in using context aware systems.

Classification of main types of Context:

① (Physical) Environment context -

What → Type of physical environment or physical phenomenon context awareness such as awareness of temperature, light intensity, chemical or biological concentration, etc.

Where → Spatial awareness or location awareness. E.g. the current location in relation to a start or destination location or to a route.

When → Temporal awareness. E.g. when context is useful now, later or during some activity.

② ICT Environment System Context -

How → ICT awareness: E.g. a context or context aware application can be accessed over a wireless link and via a mobile terminal.

③ User Environment Context -

Who → User context awareness, personal preferences, personal identity context, user activity or task context, social context.

④ Goal Context -

Why → why a context is useful? e.g. location services to show someone or something relevant to their destination.

Conclusion:

The concept of context awareness was implemented in a location service where different points of interest were plotted in relevance to user's mood.



UBIQUITOUS COMPUTING LABORATORY

EXPERIMENT – 3

EXECUTION

Code:

```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
<title>Display a map on a webpage</title>
<meta name="viewport" content="initial-scale=1, maximum-scale=1, user-
scalable=no">
<link href="https://api.mapbox.com/mapbox-gl-js/v2.13.0/mapbox-gl.css"
rel="stylesheet">
<script src="https://api.mapbox.com/mapbox-gl-js/v2.13.0/mapbox-
gl.js"></script>
<script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.9.1/jquery.min.js"></script
>
<style>
body { margin: 0; padding: 0; }
#map { position: absolute; top: 0; bottom: 0; width: 100%; }
</style>
</head>
<body>
<div id="map"></div>
<script>
    var lat, lon;
    //var x = document.getElementById("demo");
    function getLocation() {
        if (navigator.geolocation) {
            navigator.geolocation.getCurrentPosition(showPosition);
        } else {
            //x.innerHTML = "Geolocation is not supported by this browser.";
        }
    }

    function showPosition(position) {
        lat = position.coords.latitude;
        lon = position.coords.longitude;
        console.log(lat, lon);
        plt(lon,lat);
    }
</script>
<script>
    getLocation();
```



```
function nearby(lon, lat, map_obj, val){
  let txt = "museum";
  if (val == 1){
    txt = "mall";
  }
  else if (val == 2){
    txt = "beach";
  }
  else if (val == 4){
    txt = "theater";
  }
  else if (val == 5){
    txt = "amusement";
  }
  else if (val == 3){
    txt = "tour";
  }
  else{
    txt = "restaurant";
  }
  const settings = {
    "async": true,
    "crossDomain": true,
    "url":
"https://api.mapbox.com/geocoding/v5/mapbox.places/"+txt+".json?type=poi&proximity="+lon+"%2C"+lat+"&access_token=your access token",
    "method": "GET",
    "headers": {
      "Accept": "*/*",
      //"User-Agent": "Thunder Client (https://www.thunderclient.com)"
    }
  };
  $.ajax(settings).done(function (response) {
    console.log(response.features);
    response.features.map((item)=>{
      console.log(item.center.reverse());
      var marker = new mapboxgl.Marker({ color: 'red' })
        .setLngLat(item.center.reverse())
        .setPopup(new
mapboxgl.Popup().setHTML("<p>"+item.place_name+"</p>"))
        .addTo(map_obj);
    })
  });
}

function plt(lon,lat){
```

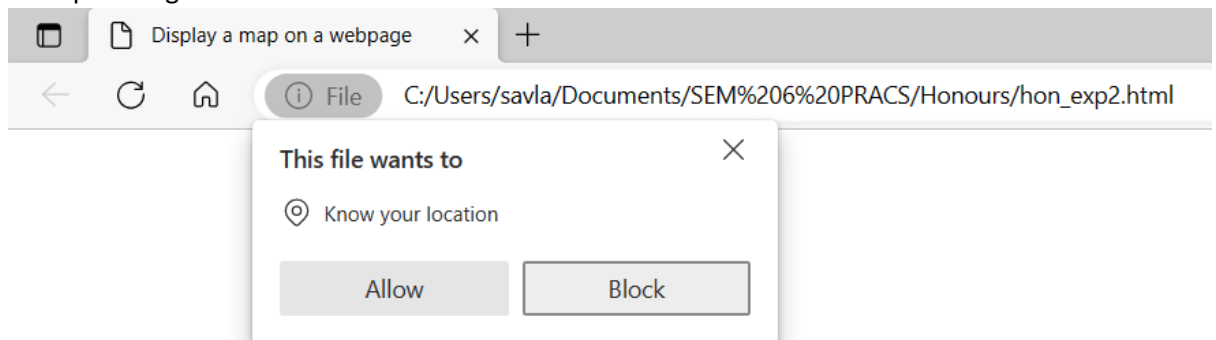


```
mapboxgl.accessToken = "your access token";
const map = new mapboxgl.Map({
  container: 'map', // container ID
  // Choose from Mapbox's core styles, or make your own style with
  Mapbox Studio
  style: 'mapbox://styles/mapbox/streets-v12', // style URL
  center: [lon, lat], // starting position [lng, lat]
  zoom: 20 // starting zoom
});
let foo = prompt('How is your mood?\n1. Happy\n2. Sad\n3. Angry\n4.
Bored\n5. Excited\n');
let val = parseInt(foo);
nearby(lon,lat, map, val);
const marker1 = new mapboxgl.Marker({ color: 'black' })
.setLngLat([lon, lat])
.setPopup(new mapboxgl.Popup().setHTML("<p>You are here! </p>"))
.addTo(map);
}

</script>
</body>
</html>
```

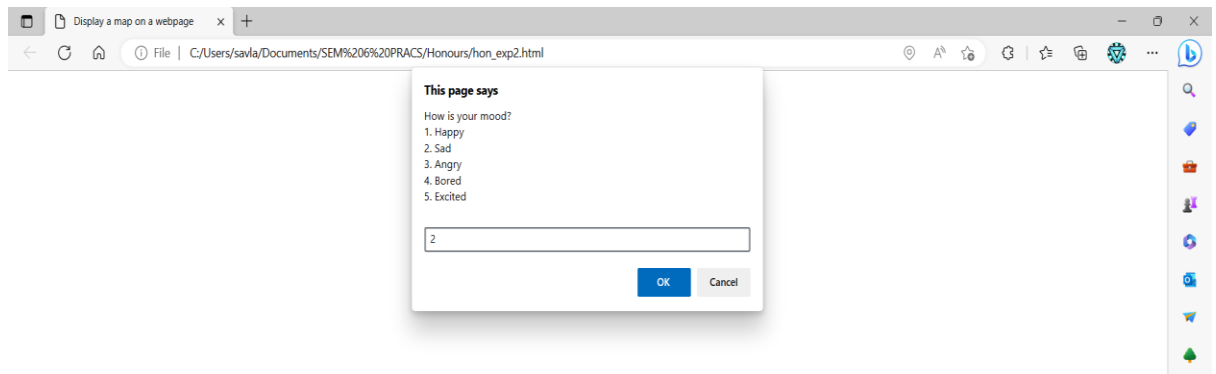
Output:

1. Prompt asking for current location





2. Taking in Context (User's Mood)



3. Final Map (Black Marker is user's location and Red Markers are beaches as mood selected was sad)

