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BRANCH : COMPUTER ENGINEERING(A1)
SUBJECT : Ubiquitous Computing
EXPERIMENT – 3
Context Awareness System

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BRANCH - Computer Engineering

Experiment - 3 :-

Aim - To implement a context aware system

Theory - A context aware system in ubiquitous computing is a system that is able to detect and interpret a user's context and adapt its behavior accordingly Context can refer to a wide range of factors, including the user's location, time, device type, network connection and other environmental variables. By leveraging context information, context-aware systems are able to provide more personalized and relevant experiences to users, making them more efficient and effective
Context-aware systems can be implemented using a range of technologies, including sensors, machine learning and natural language processing. For eg, a context-aware system could use GPS sensors to detect a user's location and suggest nearby points of interest such as restaurants or shops.

Models of context-aware system need to define what a range of contexts describes and how contexts are created, composed and used for adaption. 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) Environmental context -
what → Type of physical environment or physical phenomenon context awarness such as awarness of temperature, light intensity, chemical

or biological concentration, etc.
where → Spacial awarness or location awarness. eg - the current location is relation to a start or destination location or to a route.
when → Temporal awarness. eg - when context is useful now, later or during some activity.

2) ICT Environment system context -
How → ICT environment awarness. eg - 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 awarness, personal preferances, personal identity context, user activity or task context, social context.

4) Goal context -
why → why a context is useful? eg - location services to show someone or something relessant to their destination.

Code :

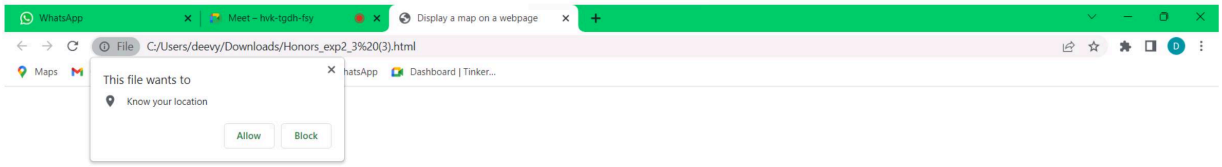
```
<!DOCTYPE html>
<html>
<head>
<meta charset="utf-8">
<title>Display a map on a webpage</title>
<meta name="viewport"
content="initial-scale=1,maximum-scale=1,user-scalable=no">
<link href="https://api.mapbox.com/mapbox-gl-js/v2.13.0/mapbox-gl.css"
rel="stylesheet">
<script
src="https://api.mapbox.com/mapbox-gl-js/v2.13.0/mapbox-gl.js"></script>
<script
src="http://ajax.googleapis.com/ajax/libs/jquery/1.9.1/jquery.min.js"></scrip
t>
<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.";
```

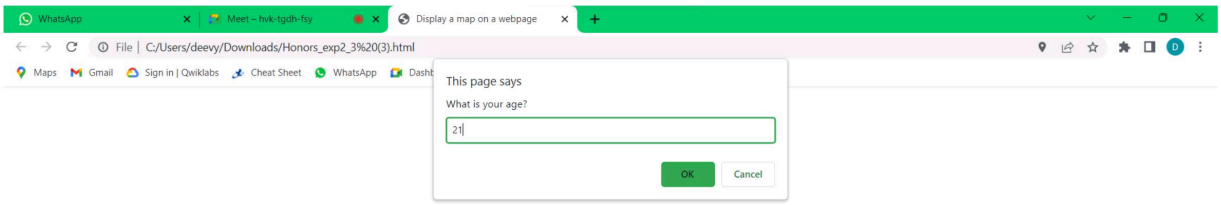
```
    }
   }

   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 <= 15){
      txt = "amusement";
     }
     else if ((val > 15) && (val <= 45)){
      txt = "theater";
     }
     else if ((val > 45) && (val <= 60)){
      txt = "tour";
     }
     else{
      txt = "restaurant";
     }
     const settings = {
        "async": true,
        "crossDomain": true,
```

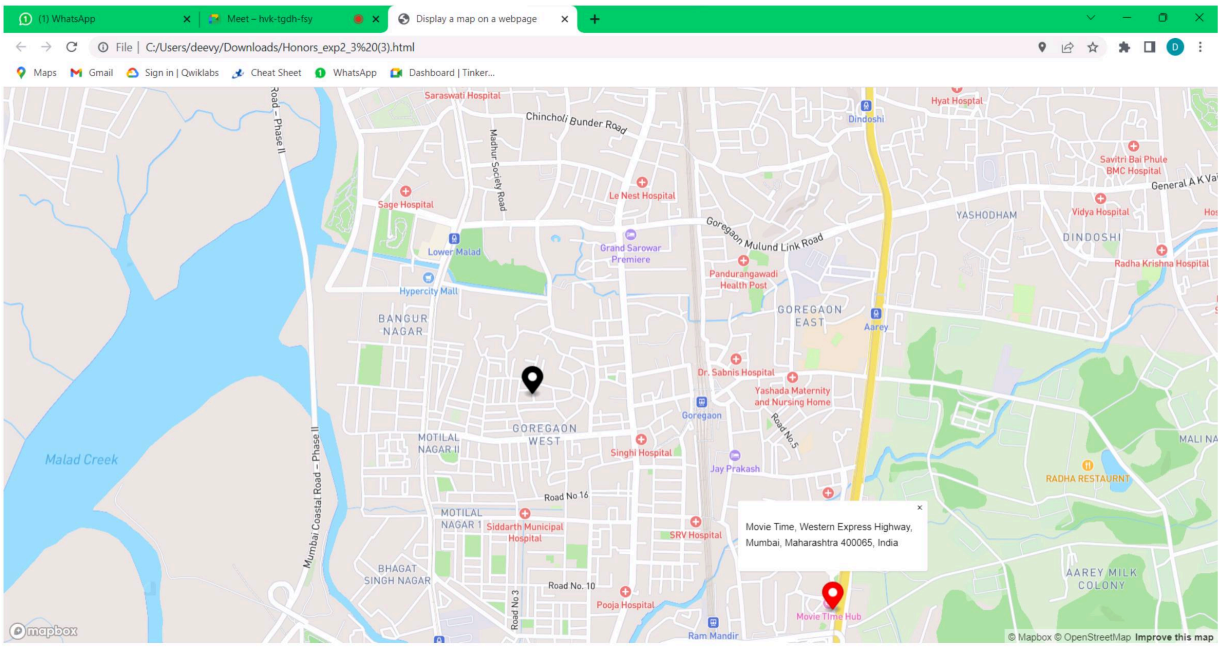
```
        "url":
"https://api.mapbox.com/geocoding/v5/mapbox.places/"+txt+".json?type=poi&proximity="+lon+"%2C"+lat+"&access_token=your token",
        "method": "GET",
        "headers": {
          "Accept": "*/*",
          //"User-Agent": "Thunder Client (https://www.thunderclient.com)"
        }
      };
      $.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 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('What is your age?');
    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 :




WhatsApp
Meet – hvk-tgdh-fsy
Display a map on a webpage
File | C:/Users/deevy/Downloads/Honors_exp2_3%20(3).html
Maps
Gmail
Sign in | Qwiklabs
Cheat Sheet
WhatsApp
This page says
What is your age?
21
OK
Cancel


(1) WhatsApp
Meet – hvk-tgdh-fsy
Display a map on a webpage
File | C:/Users/deevy/Downloads/Honors_exp2_3%20(3).html
Maps
Gmail
Sign in | Qwiklabs
Cheat Sheet
WhatsApp
Dashboard | Tinker...
Saraswati Hospital
Chincholi Bunder Road
Madhur Society Road
Sage Hospital
Le Nest Hospital
Lower Malad
Hypercity Mall
Grand Sarowar Premiere
Goregaon Mulund Link Road
Pandurangawadi Health Post
BANGUR NAGAR
GOREGAON EAST
Aarey
Hyat Hospital
Dindoshi
Savitri Bai Phule BMC Hospital
Vidya Hospital
YASHODHAM
DINDOSHI
Radha Krishna Hospital
Dr. Sabnis Hospital
Yashada Maternity and Nursing Home
Goregaon
Road No.5
GOREGAON WEST
MOTILAL NAGAR II
Singhi Hospital
Jay Prakash
RADHA RESTAURNT
Malad Creek
Mumbai Coastal Road - Phase II
Road No.16
MOTILAL NAGAR I
Siddarth Municipal Hospital
SRV Hospital
Movie Time, Western Express Highway, Mumbai, Maharashtra 400065, India
BHAGAT SINGH NAGAR
Road No. 10
Road No.3
Pooja Hospital
Ram Mandir
Movie Time Hub
AAREY MILK COLONY
mapbox
© Mapbox © OpenStreetMap Improve this map

Conclusion -

Context based awarness is crucial for location-based services as it allows them to adapt to user needs and preferences based on contextual information. This enhances the user experience and improves the effectiveness of location-based services. Different points of interest were plotted in relevance to user's mood.