Session: 19

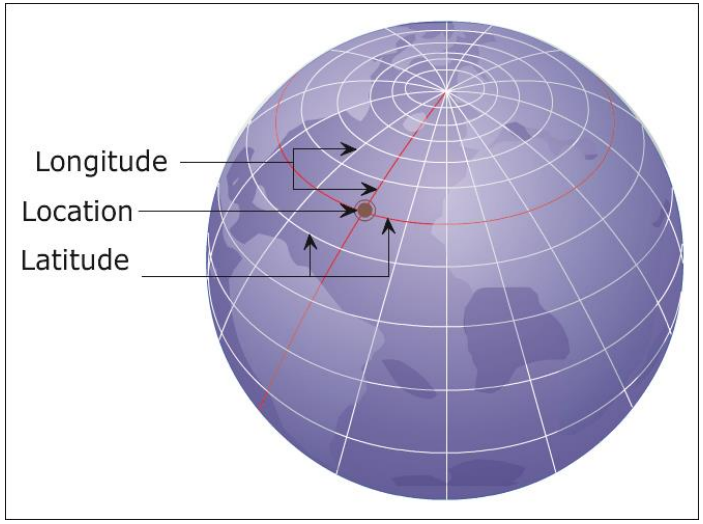
HTML5 Geolocation and APIs

Objectives

- Explain geolocation and its use in HTML5
- Explain the Google Maps API
- Explain the drag-and-drop operations in HTML5
- Explain the concept of Application Cache

Geolocation 1-2

- Geolocation in computing terminology determines the current location of a user on the devices.
- The location of the user is represented as a single point that comprises two components: latitude and longitude.



Geolocation 2-2

- Devices can determine the information about the location based on the different sources are as follows:
  - **Global Positioning System (GPS)**
    GPS is a satellite navigation system that provides information about the location on any part of the globe, maintained by the government of the United States.
  - **IP Address**
    Location information can be derived from IP Address which is assigned to devices, such as desktops, printers… connected on a network.
  - **GSM/CDMA Cell IDs**
    These are used by the cell phones.
  - **WiFi and Bluetooth MAC address**
    These are used by devices that have wireless network connection.
  - **User Input**
    It is a software tool which can be used on any device requesting for location information.
    The information is based on the data provided by the user. eg, a zip code.

Geolocation API

- In HTML5, the Geolocation API is a specification by W3C for providing a consistent way to develop location-aware Web apps.
- The Geolocation API provides a high-level interface to retrieve location information related to the hosting devices.
- The interface hides the details, such as how the information is gathered or which methods were used to retrieve the information.
- The object that holds implementation of the Geolocation API is the Geolocation object.
- This object is used in JavaScript to retrieve the geographic information about the devices programmatically.
- The Geolocation API is supported on most of the modern browsers available on desktop and mobile phones.

Implementing Geolocation Object

- The Geolocation object is available as a new property of the navigator object.
  var geolocation = **window**.navigator.**geolocation**;

Browser	Version Support
Safari	5.0+
Chrome	5.0+
Firefox	3.5+
Internet Explorer	9.0+
Opera	10.6+
iOS (Mobile Safari)	3.2+
Android	2.0+
Blackberry	6+

Geolocation Methods

- The **geolocation** object provides three methods to determine the current position of the user: **getCurrentPosition(), watchPositon(), clearWatch()**.
- The **PositionError** object holds information related to errors occurred while finding the geographic location of the user.
- Following table lists the properties of **PositionError** object.

Property
code
message

1	PERMISSION_DENIED
2	POSITION_UNAVAILABLE
3	TIMEOUT

PositionOptions Object

- **PositionOptions** object is an optional third parameter passed to the **getCurrentPosition()** method.
- Following table lists the attributes of **PositionOptions** object.

Attribute	Description
enableHighAccuracy	Indicates that the application wants to receive the most accurate results for geolocation. The default value of the attribute is false.
maximumAge	Obtains the cached position object whose age is less than the specified maximumAge limit (in milliseconds). If age limit is set to 0, then the application must obtain a new position object.
timeout	Indicates the maximum time length (in milliseconds) for which the application can wait to obtain the position object.

Google Maps API

- Google Maps API is used to display locations on a map based on the values of their coordinates: latitude and longitude.
- It must be configured in JavaScript, before it can be referenced further on the page.
- It contains a Map object which is instantiated and displayed on a Web page.
- Following syntax shows the configuration of Google Maps API in JavaScript.

```
<script
  src="http://maps.google.com/maps/api/js?sensor=false"></script>
```

where,

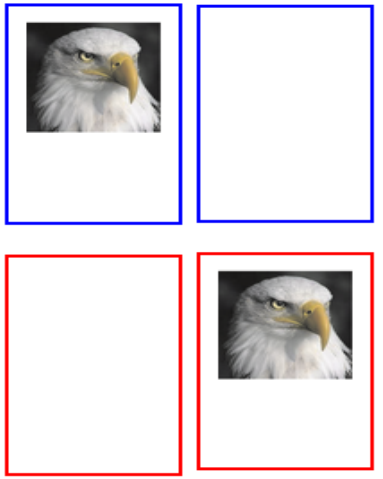
- src: Is the URL of Google Maps API.
- sensor: Parameter sent with the URL. It indicates whether application uses any sensor such as GPS system.

Tracking User's Location

- The **Geolocation** object is used by the Google Maps API to display the geolocation information in the applications.

Latitude is :19.017656 and Longitude is 72.856178

Drag and Drop



HTML5 defines drag-and-drop operations that are based on events drag-and-drop operations are supported by all major browsers.

The event-based mechanism allow the elements to be copied, reordered, or deleted on a Web page.

The drag-and-drop operation involves the use of a pointing device, such as mouse on a visual medium.

To perform the drag operation, a mousedown event is triggered followed by multiple mousemove events.

Similarly, the drop operation is performed when a user releases the mouse.

Drag – Drop Events

- During various stages of the drag-and-drop operation, a number of events are fired. These events are mouse-based events.
- Following table lists the various events triggered during the drag operation.

Event	Description
dragstart	Triggers when an element is started to be dragged by the user.
drag	Triggers when an element is being dragged using a mouse.
dragleave	Triggers when the drag and drop operation is completed.

Event	Description
dragenter	Triggers when a draggable element is being dragged on the target element for the first time.
dragleave	Triggers when an element is dragged outside the target element.
dragover	Triggers when an element is dragged inside the target element.
drop	Triggers when an element is dropped in the target element.

Offline Web Applications API

- HTML5 supports offline Web apps that allow to work without being online.
- Offline Web apps work by saving all the web pages locally on the user's system.
- This concept is also known as Application Cache.
- The Application Cache enables all resources, such as HTML, JavaScript, images, and CSS pages of an Web app to be stored locally on the system.
- Following are the steps that can be taken to cache resources locally on the system.
  1. Create a manifest file to define the resources that need to be saved.
  2. Reference the manifest file in each Web page designed to use cached resources.

Creating a Manifest File 1-2

- The manifest file is a text file that defines the caching behavior for resources used by the Web page , has the **.manifest** extension.
- The Code Snippet demonstrates creation of a manifest file.

```
CACHE:
# Defines resources to be cached.
   check.js
   styles.css
   images/figure1.jpg

FALLBACK:
# Defines resources to be used if non-cached resources
# cannot be downloaded
  Other_images/ figure2.png

NETWORK:
# Defines resources that will not be cached.
  figure3.png
```

Creating a Manifest File 2-2

- Following are the sections defined in the .manifest file.

CACHE

- This section defines resources, such as `check.js`, `styles.css`, and `figure1.png` to be stored locally.

FALLBACK

- This section defines alternative resource to be used, when the actual resource is not available.

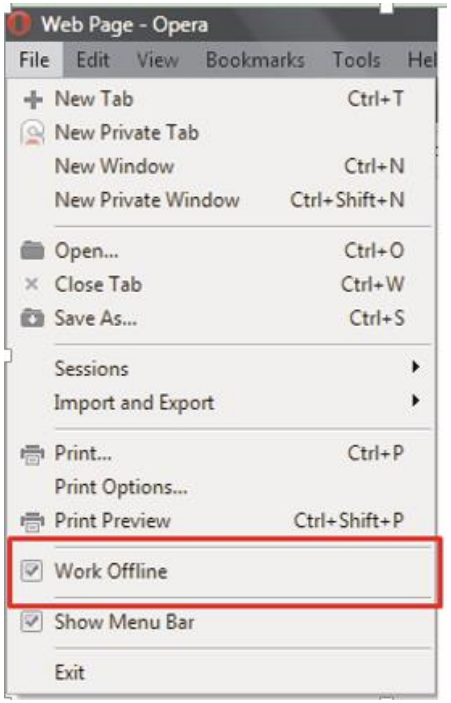
NETWORK

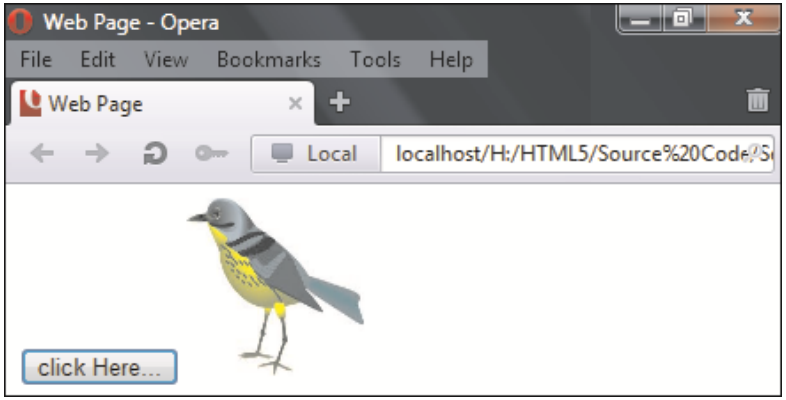
- This section specifies resources to be accessed when there is a network connection. Resources in this section are not cached..

```
<!doctype html>
<html manifest="appcache.manifest">
 <head>
  <title> Web Page </title>
     <link rel="stylesheet" href="styles.css"/>
     <script type="text/javascript" src="check.js"></script>
 </head>
 <body>
  <input type="button" value="click Here..." onClick="display()"/>
  <img src="images/figure1.jpg" width="100" height="100"/>
 </body>
</html>
```

Declaring a Manifest

- The benefit of Application Cache is that it improves the performance of a Web page by reducing the number of requests made to the Web server.
- Following figure shows how to enable the Work Offline mode in Opera browser





Summary

- Geolocation determines the current location of a user on devices.
- The location is represented as a single point on a map that comprises two components: latitude and longitude.
- The Goelocation API is a specification provided by the W3C which provides a consistent way to develop location-aware Web applications.
- Google Maps API is used to display the user's location on the map.
- The object of type Map is created in JavaScript, before it can be referenced in an HTML document.
- The drag-and-drop operations defines an event-based mechanism using which elements on a Web page can be copied, reordered, or deleted.
- HTML5 supports offline Web applications that allow a user to work with them without being online.