내위치 기반 검색하기

프로젝트명 : B18GeoLocations

준비사항

- 의존설정 : Spring Web, Lombok, JDBC API, Oracle Driver, Mybatis Framework
- JSP 사용을 위한 설정을 한다.
- Refresh Gradle Project 를 눌러 적용한다.

기본설정

JDBC가 의존추가 되었으므로 이에 대한 설정을 해야 프로젝트가 실행된다.

뷰 : webapp/WEB-INF/views/home.jsp

```
<body>
    <h1>GeoLocation 활용해 내위치 알아내기</h1>
    <ul>
        <li><a href="/">루트</a></li>
        <li>
            <a href="./01GeoLocation.do" target="_blank">내위치알아내기</a>
        </li>
        <li>
            <a href="./02GoogleMap.do" target="_blank">구글맵 띄워보기</a>
        </li>
        <li>
            <a href="./03MyLocation.do" target="_blank">내위치 출력하기</a>
        </li>
        <li>
            <a href="./04SearchRadius.do" target="_blank">내위치기반반경검색</a>
        </li>
    </ul>

</body>
```

프로퍼티 : resources/application.properties

```
# oracle 설정
spring.datasource.driver-class-name=oracle.jdbc.OracleDriver
spring.datasource.url=jdbc:oracle:thin:@localhost:1521:xe
spring.datasource.username=musthave
spring.datasource.password=1234

# mybatis 매퍼의 위치 설정
mybatis.mapper-locations=classpath:mapper/**/**.xml

```

인터페이스 : com/edu/springboot/mybatis/ISearchRadius.java

```java
package com.edu.springboot.mybatis;

import java.util.ArrayList;

@Mapper
public interface ISearchRadius {
    public int searchCount(int distance, double latTxt, double lngTxt);

    public ArrayList<MyFacilityDTO> searchRadius(int distance,
            double latTxt, double lngTxt, int start, int end);
}

```

매퍼 : resources/mapper/GeoMapper.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>

<!DOCTYPE mapper
    PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN"
    "http://mybatis.org/dtd/mybatis-3-mapper.dtd">

<mapper namespace="com.edu.springboot.mybatis.ISearchRadius">

```

1.내 위치 알아내기

컨트롤러 : com/edu/springboot/MainController.java

```java
package com.edu.springboot;

import java.util.ArrayList;

@Controller
public class MainController {

    @Autowired
    ISearchRadius dao;

    @RequestMapping("/")
    public String home() {
        return "home";
    }

    //private static final String apiKey = "AIzaSyCktZFiCeZuQSXfdamncA
    private static final String apiKey = "AIzaSyCVoEX4YifBDjG7bR3jLr_n

```

```java
    //내위치값 알아내기
    @GetMapping("/01GeoLocation.do")
    public String geoFunc1(Model model) {
        model.addAttribute("apiKey", apiKey);
        return "01GeoLocation";
    }

    //구글맵 연동
    @GetMapping("/02GoogleMap.do")
    public String geoFunc2(Model model) {
        model.addAttribute("apiKey", apiKey);
        return "02GoogleMap";
    }

    //구글맵에 내위치 출력하기
    @GetMapping("/03MyLocation.do")
    public String geoFunc3(Model model) {
        model.addAttribute("apiKey", apiKey);
        return "03MyLocation";
    }
```

뷰 : webapp/WEB-INF/views/01GeoLocation.jsp

```jsp
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>01GeoLocation.jsp</title>
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/b
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/b
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.7.1/jqu
<script type="text/javascript">
var span;
window.onload = function(){
    span = document.getElementById("result");

    if(navigator.geolocation){
        span.innerHTML = "Geolocation API를 지원합니다.";

```

```
        var options = {
            enableHighAccurcy:true,
            timeout:5000,
            maximumAge:3000
        };
        navigator.geolocation.getCurrentPosition(showPosition,
                showError,options);
    }
    else{
        span.innerHTML =
            "이 브라우저는 Geolocation API를 지원하지 않습니다.";
    }
}
//위치를 찾았을때의 콜백메소드
var showPosition = function(position){

    console.log("showPosition() 콜백됨");

    var latitude = position.coords.latitude;
    var longitude = position.coords.longitude;
    span.innerHTML = "위도:"+latitude+", 경도:"+longitude;

    document.getElementById("lat").value = latitude;
    document.getElementById("lng").value = longitude;
}
```

```
var showError = function(error){
    switch(error.code){
        case error.UNKNOWN_ERROR:
            span.innerHTML = "알수없는오류발생";break;
        case error.PERMISSION_DENIED:
            span.innerHTML = "권한이 없습니다";break;
        case error.POSITION_UNAVAILABLE:
            span.innerHTML = "위치 확인불가";break;
        case error.TIMEOUT:
            span.innerHTML = "시간초과";break;
    }
}
</script>
</head>
```

```
<body>
<div class="container">
    <h2>GeoLocation - 현재위치의 위도,경도 알아내기</h2>
    <fieldset>
        <legend>현재위치 - 위도, 경도</legend>
        <span id="result" style="color:red; font-size:1.5em;
            font-weight:bold;"></span>
    </fieldset>

    위도 : <input type="text" id="lat" />
    경도 : <input type="text" id="lng" />
</div>
</body>
</html>
```

여기까지 작성하세요.

2.구글맵 띄우기

```jsp
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>02GoogleMap.jsp</title>
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstra
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/bootstra
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.7.1/jquery.mi
<style>
#map{
    width:800px; height:600px;
}
</style>

<script>
function initMap() {
    var uluru = {lat:37.4814641, lng:126.8531883};
    var map = new google.maps.Map(document.getElementById('map'), {
        zoom: 17,
        center: uluru
    });
    var marker = new google.maps.Marker({
        position: uluru,
        map: map
    });
}
```

```jsp
window.onload = function(){
    initMap();
}
</script>
</head>
<body>
<div class="container">
    <h2>Google Map 띄워보기</h2>
    <div id="map"></div>
    <script async defer
    src="https://maps.googleapis.com/maps/api/js?key=${apiKey }"></script>
</div>
</body>
</html>
```

여기까지 작성하세요.

3.구글맵에 내 위치 표시하기

```jsp
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>03MyLocation.jsp</title>
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.7.1/jq
<style>
#map{
    width:100%; height:700px;
}
</style>
<script type="text/javascript">
var span;
window.onload = function(){
    span = document.getElementById("result");

    if(navigator.geolocation){
        span.innerHTML = "Geolocation API를 지원합니다.";

        var options = {
            enableHighAccurcy:true,
            timeout:5000,
            maximumAge:3000
        };
        //navigator.geolocation.getCurrentPosition(showPosition,
        //      showError,options);

        //지속적인 위치 갱신이 필요한 경우 사용
        var watchID =
            navigator.geolocation.watchPosition(showPosition,
                    showError,options);
        //navigator.geolocation.clearWatch(watchID);
    }
    else{
        span.innerHTML =
            "이 브라우저는 Geolocation API를 지원하지 않습니다.";
    }
}
```

```
var showPosition = function(position){
    var latitude = position.coords.latitude;
    var longitude = position.coords.longitude;
    span.innerHTML = "위도:"+latitude+",경도:"+longitude;

    initMap(latitude, longitude) ;
}

function initMap(latVar, lngVar) {
    var uluru = {lat: latVar, lng: lngVar};
    var map = new google.maps.Map(document.getElementById('map'), {
        zoom: 17,
        center: uluru
    });
    var marker = new google.maps.Marker({
        position: uluru,
        map: map
    });
}
```

```
var showError = function(error){
    switch(error.code){
        case error.UNKNOWN_ERROR:
            span.innerHTML = "알수없는오류발생";break;
        case error.PERMISSION_DENIED:
            span.innerHTML = "권한이 없습니다";break;
        case error.POSITION_UNAVAILABLE:
            span.innerHTML = "위치 확인불가";break;
        case error.TIMEOUT:
            span.innerHTML = "시간초과";break;
    }
}
</script>
</head>
```

```
<body>
<div class="container">
    <h2>내위치를 구글맵에 표시하기</h2>
    <fieldset>
        <legend>현재위치 - 위도, 경도</legend>
        <span id="result" style="color:red; font-size:1.5em;
            font-weight:bold;"></span>
    </fieldset>
    <div id="map"></div>
```

```
87      <script async defer
88          src="https://maps.googleapis.com/maps/api/js?key=${apiKey }">
89      </script>
90  </div>
91  </body>
92  </html>
93
```

4.내 위치 기반 반경 검색하기

geolocation으로 얻어온 위/경도를 기반으로 지정된 반경에 있는 시설물 검색하기

테이블생성

```
CREATE TABLE global_facility (
        idx number PRIMARY KEY ,
        hp_sido varchar2(20)  ,
        hp_gugun varchar2(40)  ,
        hp_genre number(2) ,
        hp_genre_name varchar2(30)  ,
        hp_name varchar2(100)  ,
        hp_url varchar2(400)  ,
        hp_explain varchar2(400)  ,
        hp_tel varchar2(20)  ,
        hp_addr varchar2(100)  ,
        hp_naver_x varchar2(10)  ,
        hp_naver_y varchar2(10)  ,
        hp_latitude varchar2(20)  ,
        hp_longitude varchar2(20)
);
```

데이터 삽입 : 데이터는 첨부된 zip파일을 이용해서 insert한다. 아래 쿼리는 일부만 발췌한 부분이다.

[다운로드]

```
INSERT INTO global_facility VALUES
(1, '서울', '강남구', 0, '성형외과', '탑클래스성형외과',
'http://openapi.naver.com/l?AAAC2LywqDMBREv2bcCJKHKfcuXCRp+h9BUwQFU5si/n1TKQz
McDjz+qT9HBA8qAf732ALRy1CLQE2CA6kYOkiBta3f91JhDuYLqn+uP4uScP5ppw5Des2xrVZ0j
mwkDFFYtNTrwWZqJUScrpJLSaZmJt5T89hLiVDW6hHzXEcXdl', '강남구 위치, 안면윤곽, 쌍꺼풀 및
```

앞트임, 가슴확대, 코성형, 눈밑주름, 지방흡입 전문.', '02-567-3456', '서울특별시 강남구 역삼동 820-10 글래스타워 14층', '314226', '544529', '127.0277178', '37.4988576');

INSERT INTO global_facility VALUES (2, '서울', '강남구', 0, '성형외과', '로미안성형외과', 'http://openapi.naver.com/l?AAAC2LywqDMBREv2bcCJKHlnsXWSRp+h9BUyzaaoNF/PumUhiY4XDm/Un5MAge1IL9b7CFoxqhlAB3CA6kYOkkHayv/7qTCFcwnVL5cfmdkobz1XasycxLH+dqSodhIWOKxF1LrRbURa2UkMNFajHIxFyNOd3NuG0rtIW6lez73uT', '사각턱,
...

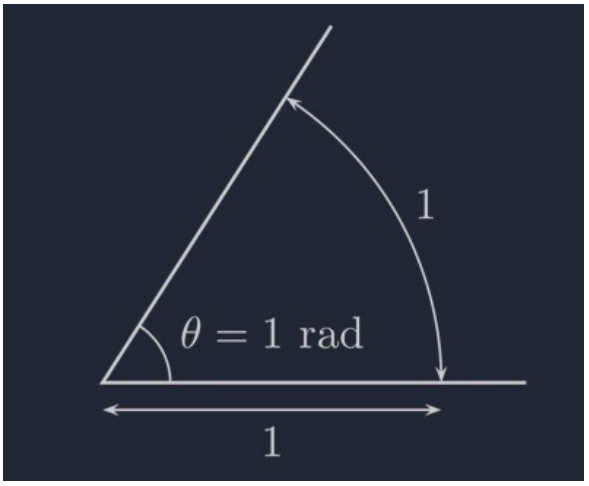
오라클 함수 생성

함수명 : radians

: radians(deg) 함수는 각도 디그리(degree)를 라디안(radian)으로 바꿔 주는 매크로 함수.

cos(rad), sin(rad), tan(rad) 삼각함수들을 사용할 때 라디안 값을 써야 하기 때문에 알아두면 편리하다.

```
create or replace function radians(ndegrees in number)
return number
is
begin
        return ndegrees / 57.295779513082320876798154814105170332 35;
end;
/
```



참고] 보통 라디안은 부채꼴의 중심각을 가지고 설명되는데, 위 그림과 같이 호의 길이가 반지름과 같게 되는 만큼의 각을 1 라디안(radian)이라고 정의한다.

함수명 : distnace_wgs84

: 거리를 측정하기 위한 함수 생성. WGS84 좌표계는 군사적인 목적에서 전 지구를 하나의 좌표계로 표현해야 하는 필요성이 증대되면서 출현하게됨.

```
create or replace function distnace_wgs84(
        My_LAT in number, My_LNG in number,
        Fa_LAT in number, Fa_LNG in number)
return number
is
begin
        return ( 6371.0 * acos(cos( radians( My_LAT ) ) * cos( radians( Fa_LAT ) )
                * cos( radians( Fa_LNG  ) - radians( My_LNG ) )
                + sin( radians( My_LAT ) ) * sin( radians( Fa_LAT ) ) )
        );
end ;
```

/

인터페이스 : com/edu/springboot/mybatis/ISearchRadius.java

앞에서 이미 작성했음

매퍼 : resources/mapper/GeoMapper.xml

```
    <select id="searchCount" resultType="int">
        SELECT COUNT(*)
        FROM global_facility
        WHERE trunc(to_number(DISTNACE_WGS84(#{param2}, #{param3},
                hp_latitude, hp_longitude)),5)<![CDATA[<=]]>#{param1}
    </select>
```

```
    <select id="searchRadius"
        resultType="com.edu.springboot.mybatis.MyFacilityDTO">
        select * from (
            SELECT Tb.*, rownum rNum FROM (
                SELECT
                    hp_name, hp_sido, hp_gugun, hp_addr, hp_url,
                    hp_latitude, hp_longitude,
                    trunc(to_number(DISTNACE_WGS84(#{param2}, #{param3},
                        hp_latitude, hp_longitude)),5) AS disKM
                FROM global_facility
                WHERE trunc(to_number(DISTNACE_WGS84(#{param2}, #{param3},
                    hp_latitude, hp_longitude)),5)<![CDATA[<=]]>#{param1}
                ORDER BY disKM ASC
            ) Tb
        )
        WHERE rNum BETWEEN ${param4} AND ${param5}
    </select>
</mapper>
```

DTO : com/edu/springboot/mybatis/MyFacilityDTO.java

```java
package com.edu.springboot.mybatis;

import lombok.Data;

@Data
public class MyFacilityDTO {
    private String hp_name; //병원명
    private String hp_sido; //시도
    private String hp_gugun; //구군
    private String hp_addr; //주소
    private String hp_url; //참조URL
    private String hp_latitude;
```

```
13      private String hp_longitude;
14      private String disKM; //거리
15      private String rNum;
16  }
17
```

컨트롤러 : com/edu/springboot/MainController.java

```
53      //내 위치기반 시설물 반경검색
54      @GetMapping("/04SearchRadius.do")
55      public String geoFunc4(Model model, HttpServletRequest req) {
56
57          model.addAttribute("apiKey", apiKey);
58          int distance = (req.getParameter("distance")==null) ?
59                  0 : Integer.parseInt(req.getParameter("distance"));
60          double latTxt = (req.getParameter("latTxt")==null) ?
61                  0 : Double.parseDouble(req.getParameter("latTxt"));
62          double lngTxt = (req.getParameter("lngTxt")==null) ?
63                  0 : Double.parseDouble(req.getParameter("lngTxt"));
64
65          int numberPerPage = 200;
66          int resultCount = dao.searchCount(distance, latTxt, lngTxt);
67          model.addAttribute("resultCount",
68                  " / 검색결과:"+resultCount+"건");
69          model.addAttribute("selectNum",
70                  Math.ceil(resultCount/numberPerPage));
71          int pageNum = (req.getParameter("pageNum")==null) ?
72                  1 : Integer.parseInt(req.getParameter("pageNum"));
73          int start = ((pageNum - 1) * numberPerPage) + 1;
74          int end = pageNum * numberPerPage;
75          System.out.println(distance +" "+ latTxt +" "+ lngTxt
76                  +" "+ start +" "+ end);
77          ArrayList<MyFacilityDTO> searchLists = null;
78          if(distance!=0) {
79              searchLists =
80                  dao.searchRadius(distance, latTxt, lngTxt, start, end);
81          }
82          model.addAttribute("searchLists", searchLists);
83
84          return "04SearchRadius";
85      }
86
87  }
```

뷰 : webapp/WEB-INF/views/04SearchRadius.jsp

```
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%@ taglib prefix="c" uri="jakarta.tags.core" %>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>04SearchRadius.jsp</title>
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css"
rel="stylesheet">
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/bootstrap.bundle.min.js"></script>
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.7.1/jquery.min.js"></script>
<style>
        #map{
                width:100%; height:700px;
        }
</style>

<!-- 검색하는 반경에 따른 맵의 줌 레벨 설정 -->
<c:choose>
        <c:when test="${param.distance eq 1 }">
                <c:set var="zoomLevel" value="15" />
        </c:when>
        <c:when test="${param.distance eq 5 }">
                <c:set var="zoomLevel" value="14" />
        </c:when>
        <c:when test="${param.distance eq 10 }">
                <c:set var="zoomLevel" value="13" />
        </c:when>
        <c:otherwise>
                <c:set var="zoomLevel" value="12" />
        </c:otherwise>
</c:choose>

<script type="text/javascript">
var span;
window.onload = function(){
```

```
	span = document.getElementById("result");

	if(navigator.geolocation){
		span.innerHTML = "Geolocation API를 지원합니다.";

		var options = {
			enableHighAccurcy:true,
			timeout:5000,
			maximumAge:3000
		};
		navigator.geolocation.getCurrentPosition(showPosition,showError,options);
	}
	else{
		span.innerHTML = "이 브라우저는 Geolocation API를 지원하지 않습니다.";
	}
}
var showPosition = function(position){
	var latitude = position.coords.latitude;
	var longitude = position.coords.longitude;
	span.innerHTML = "위도:"+latitude+",경도:"+longitude;

	//////////////////////////////////////////////////////////////////////
	document.getElementById("latTxt").value = latitude;
	document.getElementById("lngTxt").value = longitude;
	//////////////////////////////////////////////////////////////////////

	initMap(latitude, longitude) ;
}
function initMap(latVar, lngVar) {
	var uluru = {lat: latVar, lng: lngVar};
	var map = new google.maps.Map(document.getElementById('map'), {
		zoom: ${zoomLevel},
		center: uluru
	});
	var marker = new google.maps.Marker({
		position: uluru,
		map: map,
		//////////////////////////////////////////////////////////////////////
		icon: './icon/icon_me.png'
```

```
		////////////////////////////////////////////////////////////////////
	});

	////////////////////////////////////////////////////////////////////
	//다중마커s
	var infowindow = new google.maps.InfoWindow();

	var locations = [
		/*['명동', 37.563576, 126.983431],
		['가로수길', 37.520300, 127.023008],
		['광화문', 37.575268, 126.976896],
		['남산', 37.550925, 126.990945],
		['이태원', 37.540223, 126.994005]*/

		<c:forEach items="${searchLists }" var="row">
			['${row.hp_name }', ${row.hp_latitude }, ${row.hp_longitude }],
		</c:forEach>
	];

	var marker, i;

	for (i=0; i<locations.length; i++) {
		marker = new google.maps.Marker({
			id:i,
			position: new google.maps.LatLng(locations[i][1], locations[i][2]),
			map: map,
			icon: './icon/icon_facil.png'
		});

		google.maps.event.addListener(marker, 'click', (function(marker, i) {
			return function() {
				infowindow.setContent(locations[i][0]+"<br/><a
href='javascript:alert(\"병원명:"+locations[i][0]+"\");'>바로가기</a>");
				infowindow.open(map, marker);
			}
		})(marker, i));

		if(marker)
		{
```

```
                        marker.addListener('click', function() {
                                map.setZoom(16);
                                map.setCenter(this.getPosition());
                        });
                }
        }
        //다중마커e
        ////////////////////////////////////////////////////////////////////////
}
var showError = function(error){
        switch(error.code){
                case error.UNKNOWN_ERROR:
                        span.innerHTML = "알수없는오류발생";break;
                case error.PERMISSION_DENIED:
                        span.innerHTML = "권한이 없습니다";break;
                case error.POSITION_UNAVAILABLE:
                        span.innerHTML = "위치 확인불가";break;
                case error.TIMEOUT:
                        span.innerHTML = "시간초과";break;
        }
}
</script>
</head>
<body>
<div class="container">

        <h2>내위치기반 반경검색하기</h2>

        <span id="result" style="color:red; font-size:1.5em; font-weight:bold;"></span>
        <fieldset>
                <legend>검색조건 ${resultCount }</legend>
                <form name="searchFrm">
                        현재위치에서
                        <!-- 현재위치 위경도 입력상자 -->
                        <input type="text" id="latTxt" name="latTxt" />
                        <input type="text" id="lngTxt" name="lngTxt" />

                        <select name="distance" id="distance">
                                <option value="1" <c:if test="${param.distance==1
```

```
}">selected</c:if>>1Km</option>
                        <option value="5" <c:if test="${param.distance==5
}">selected</c:if>>5Km</option>
                        <option value="10" <c:if test="${param.distance==10
}">selected</c:if>>10Km</option>
                        <option value="20" <c:if test="${param.distance==20
}">selected</c:if>>20Km</option>
                        <option value="30" <c:if test="${param.distance==30
}">selected</c:if>>30Km</option>
                        <option value="40" <c:if test="${param.distance==40
}">selected</c:if>>40Km</option>
                    </select>
                    반경내 시설 검색하기
                    <select name="pageNum" id="pageNum">
                    <c:forEach begin="1" end="${selectNum }" var="i" varStatus="loop">
                        <option value="${i }" <c:if test="${param.pageNum==i
}">selected</c:if>>${i }페이지</option>
                    </c:forEach>
                    </select>

                    <input type="submit" value="검색하기" />
                </form>
        </fieldset>
        <div id="map"></div>
        <script async defer src="https://maps.googleapis.com/maps/api/js?key=${apiKey
}"></script>
</div>
</body>
</html>
```