

게시판

강사 : 강병준

테이블 작성

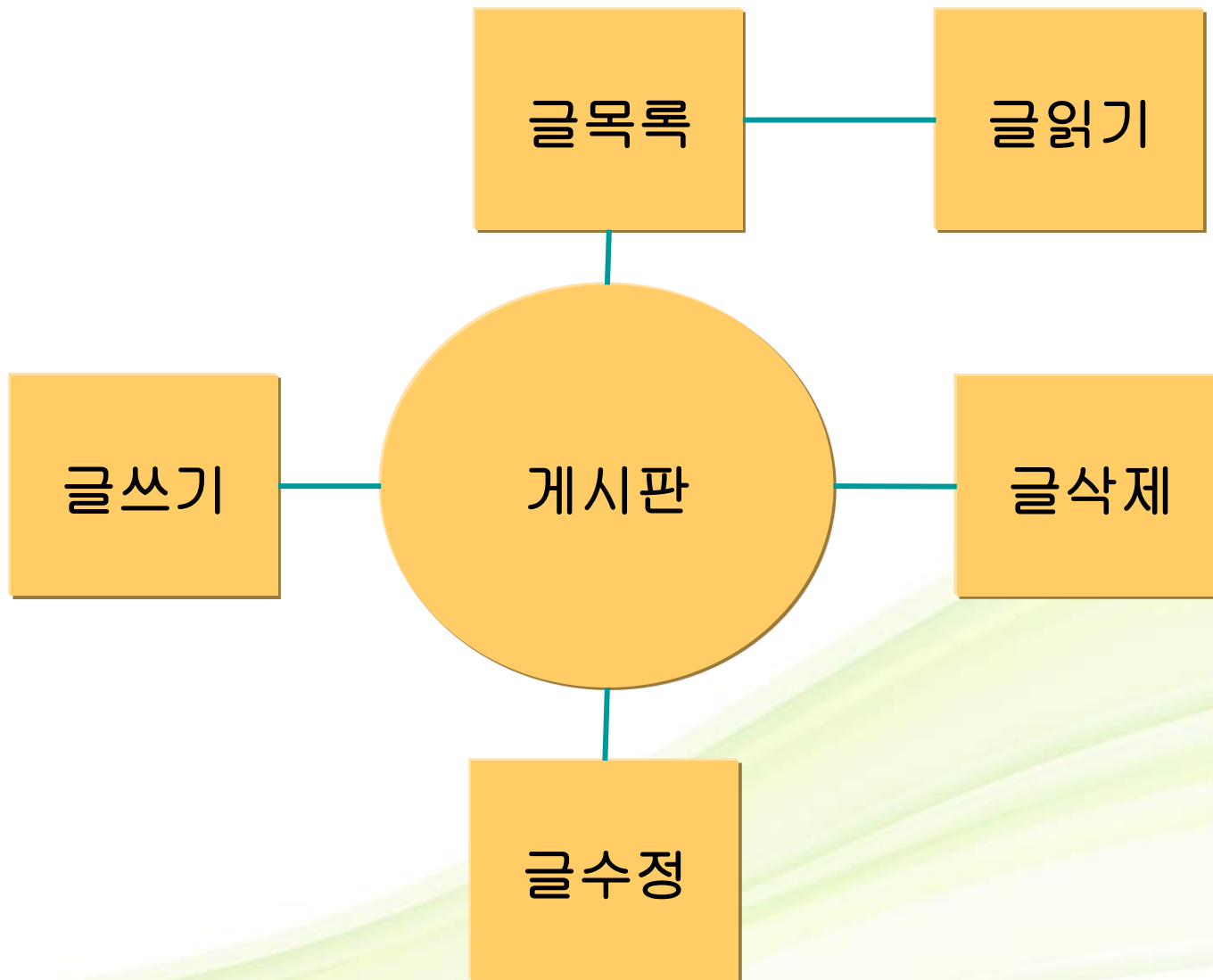
테이블 생성

```
create table board1 (  
  num number primary key,      -- key  
  writer varchar2(20) not null, -- 작성자  
  subject varchar2(50) not null, -- 제목  
  content varchar2(500) not null, -- 본문  
  readcount number default 0,   -- 읽은 횟수  
  password varchar2(12) not null, -- 암호  
  ref number not null,          -- 답변글끼리 그룹  
  re_step number not null,      -- ref내의 순서  
  re_level number not null,     -- 들여쓰기  
  reg_date date not null        -- 작성일  
);
```

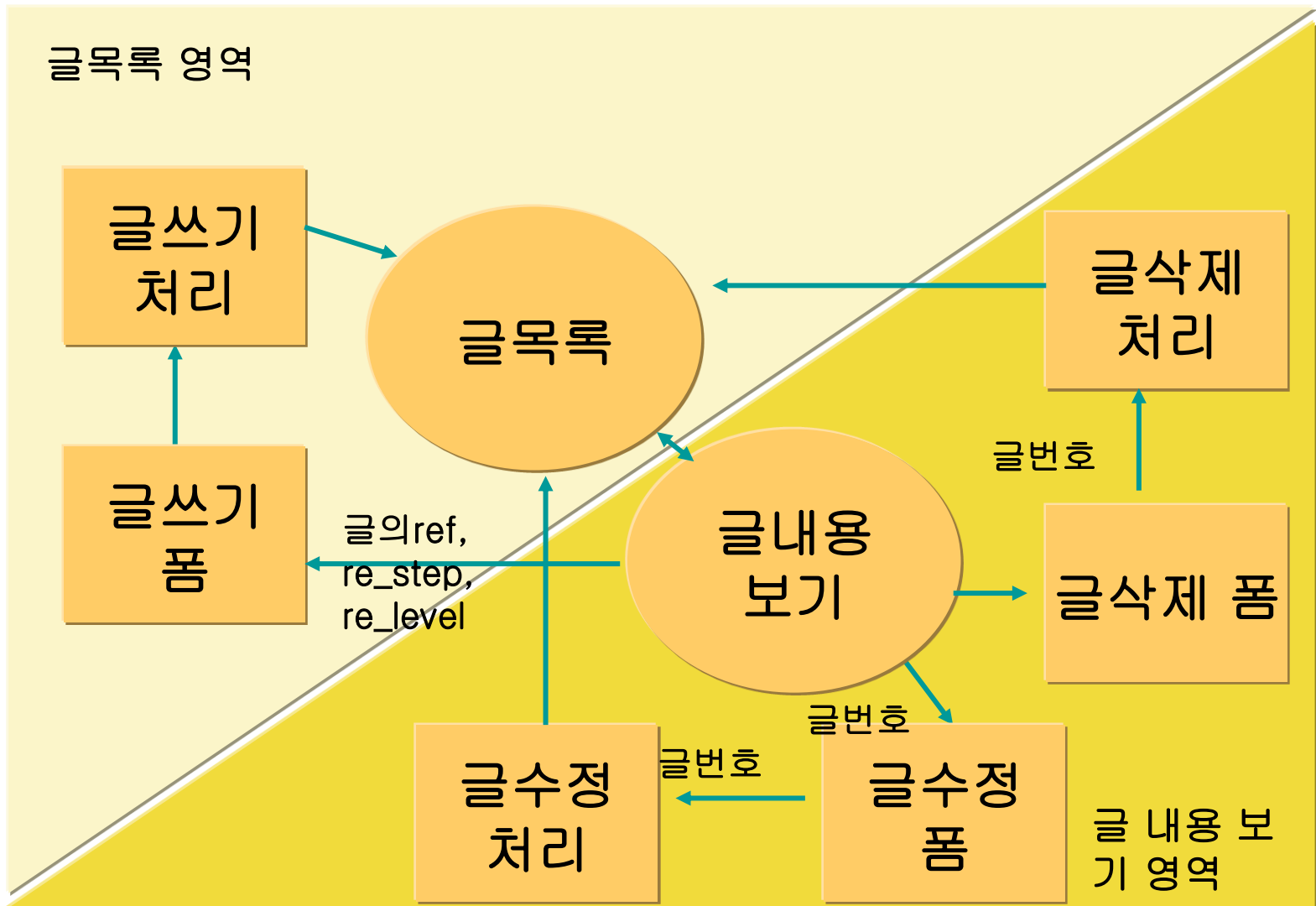
context.jsp

```
<Context>
<Resource
name= "jdbc/OracleDB"
auth= "Container"
type= "javax.sql.DataSource"
username= "scott"
password= "tiger"
driverClassName= "oracle.jdbc.driver.OracleDriver"
factory= "org.apache.tomcat.dbcp.dbcp2.BasicDataSourceFactory"
url= "jdbc:oracle:thin:@127.0.0.1:1521:xe"
maxActive= "100"
maxIdle= "10"/>
<Resource
name= "jdbc/MySql"
auth= "Container"
type= "javax.sql.DataSource"
username= "root"
password= "mysql"
driverClassName= "com.mysql.jdbc.Driver"
factory= "org.apache.tomcat.dbcp.dbcp2.BasicDataSourceFactory"
url= "jdbc:mysql://localhost:3306/test"
maxActive= "100"
maxIdle= "10"/>
</Context>
```

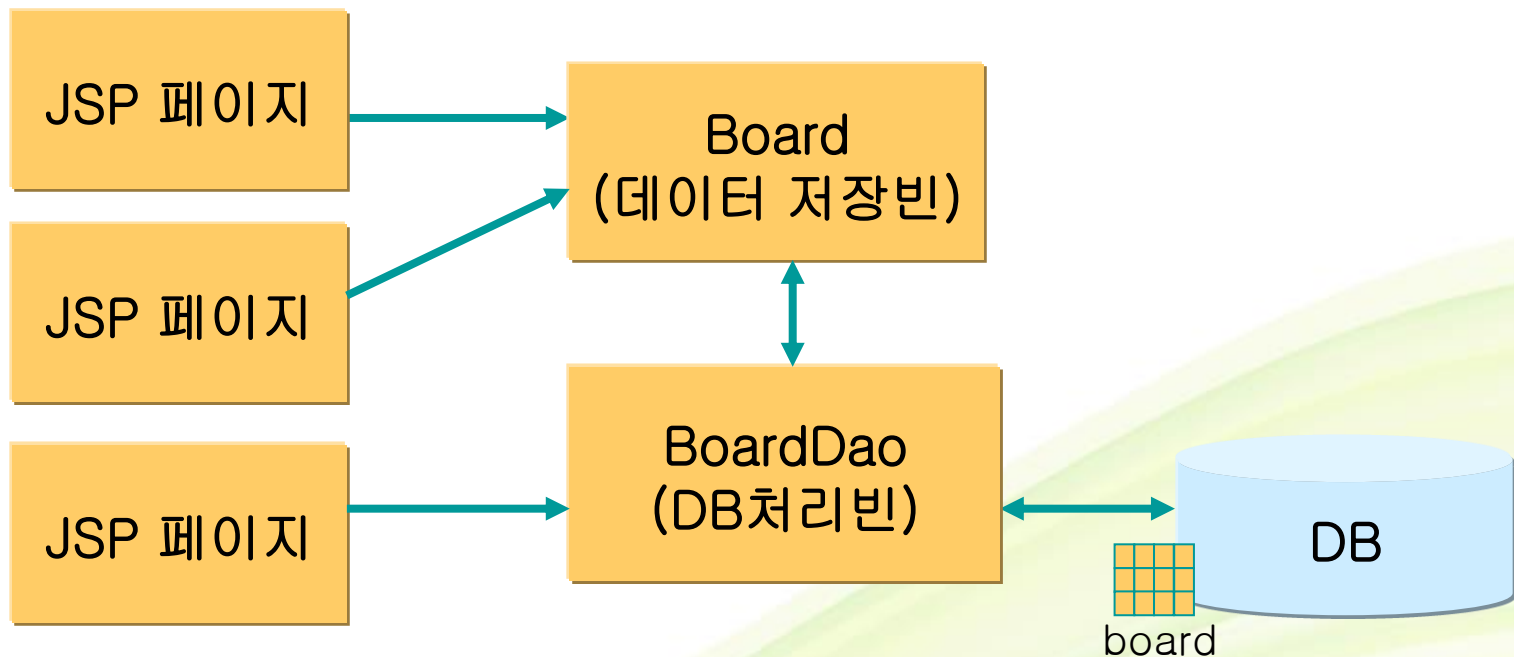
게시판시스템의 전체 개괄구조



게시판시스템의 작업영역별 구조



JSP페이지와 자바빈 그리고 DB와의 관계



IPv4로 변경

IP 체크 할일이 생겨서 검색을 했더니

<%=request.getRemoteAddr()%>

0:0:0:0:0:0:0:1 만 나온다.

IPV6 문제라고 WIN7은 기본이 IPV6

그래서 톰캣 실행시 JVM 환경변수를 추가 해야 한다고 한다.

0:0:0:0:0:0:0:1 이거랑 127.0.0.1 이랑 같다고..

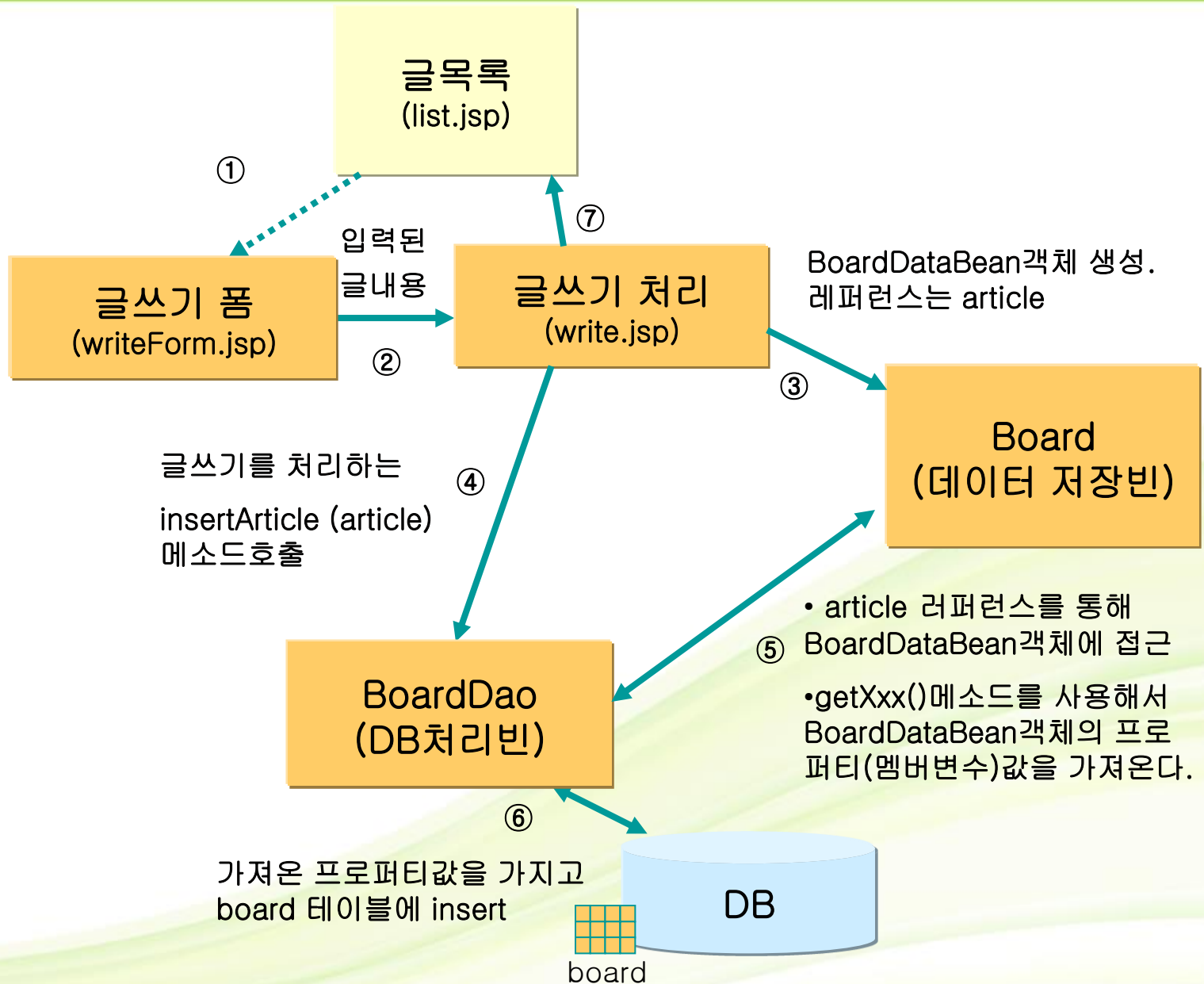
eclipse > Run > Run Configuration > Arguments >

-Djava.net.preferIPv4Stack=true

VM arguments:에 "-Djava.net.preferIPv4Stack=true" 추가

- 톰캣 재 실행후 재 확인 하면 제대로 나온다.

글쓰기 처리



글목록 보기

글쓰기 폼
(writeForm.jsp)

글쓰기 처리
(writePro.jsp)

①

글목록
(list.jsp)

④

• BoardDataBean 객체 생성.
레퍼런스는 article

Board
(데이터 저장빈)

③

글목록을 가져오는
getArticles(start, end)
메소드호출

전체레코드의 수
getArticleCount () 메
소드호출

②

BoardDao
(DB처리빈)

⑤

• article 레퍼런스를 통해
BoardDataBean 객체에 접근
• setXxx() 메소드를 사용해서
BoardDataBean 객체의 프로
퍼티(멤버변수)값을 세팅한다.

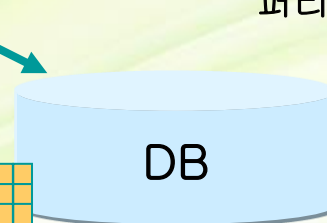
⑥

start, end 값을 가지고 board
테이블에 레코드들을 가져옴

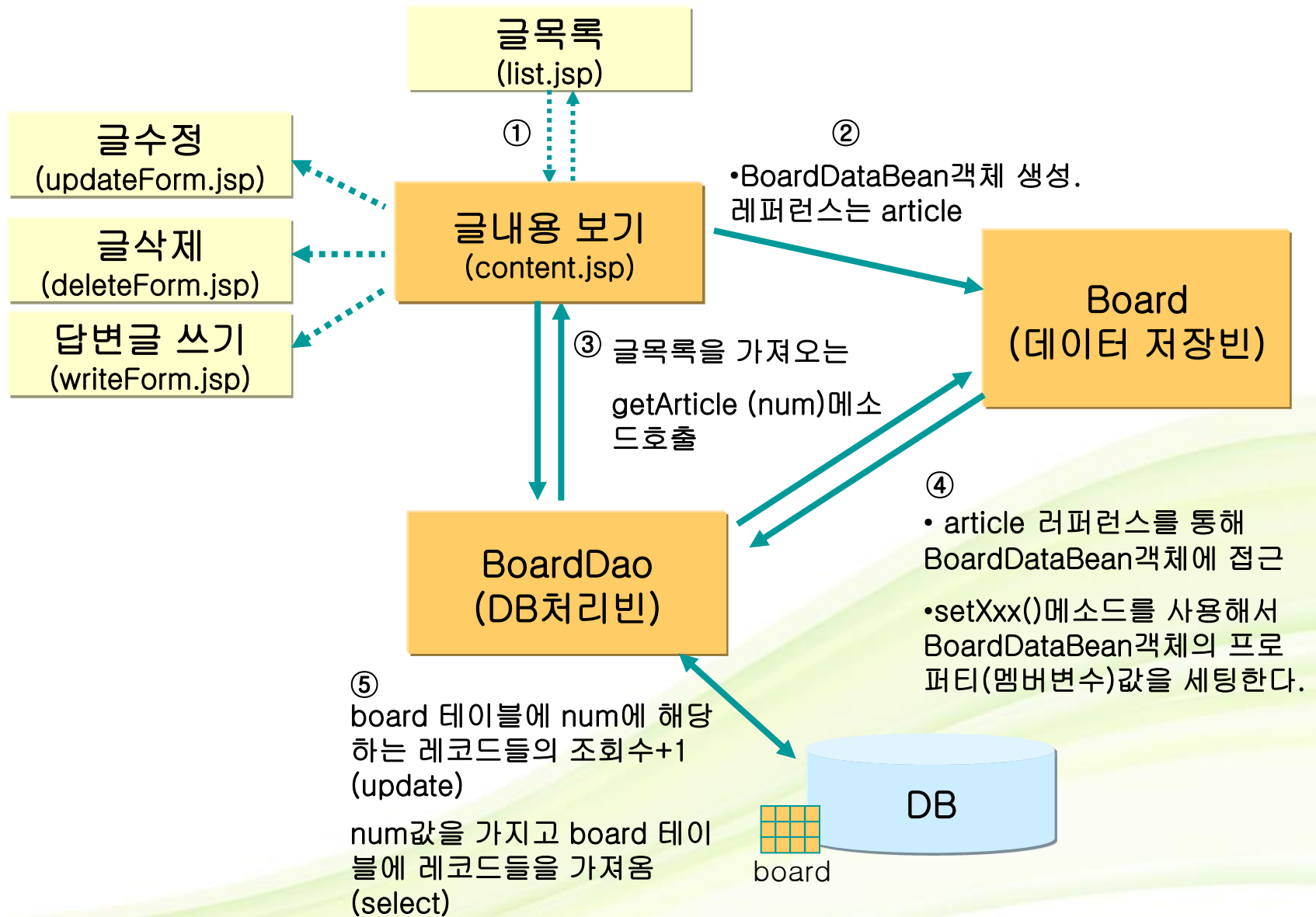


board

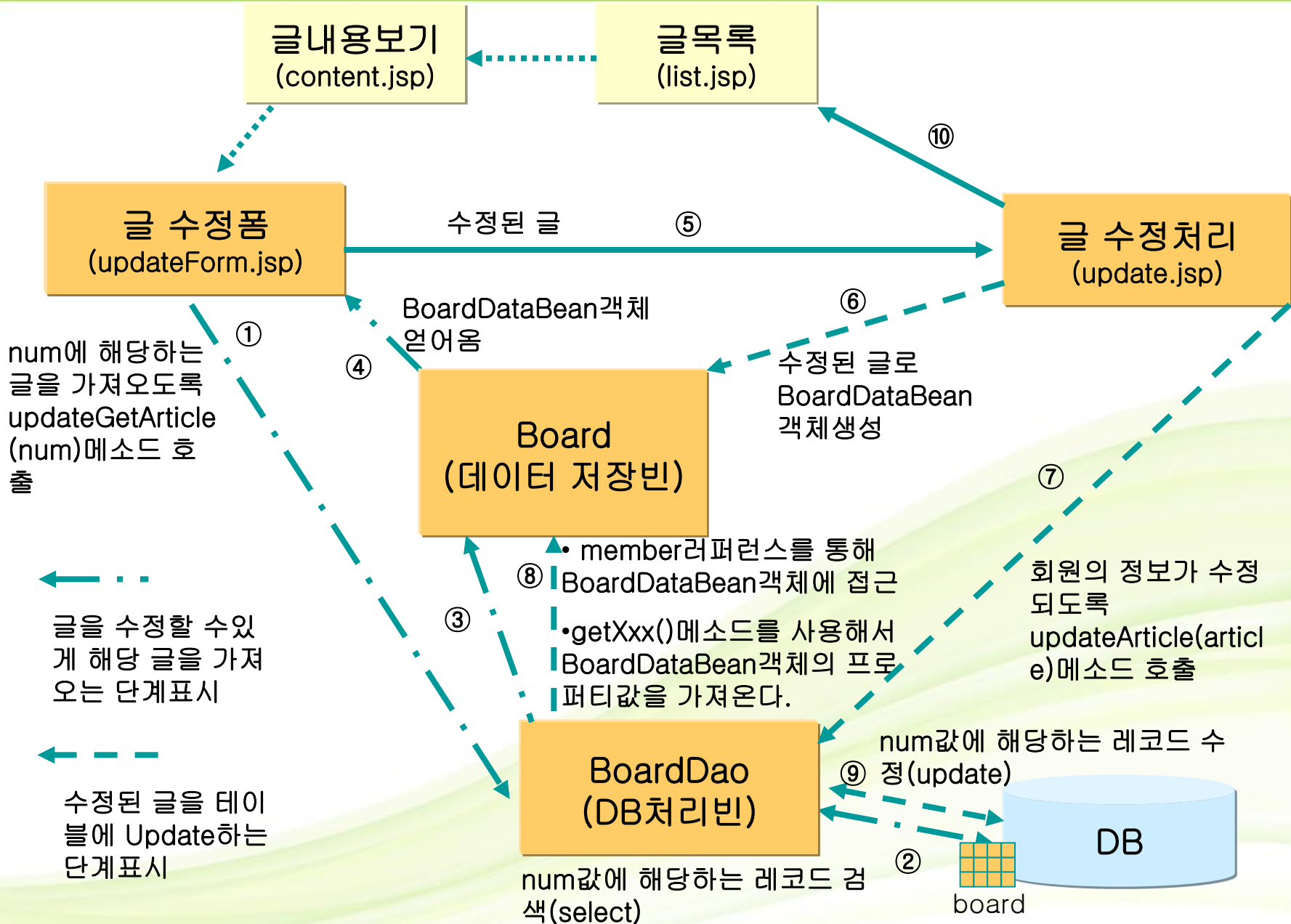
DB



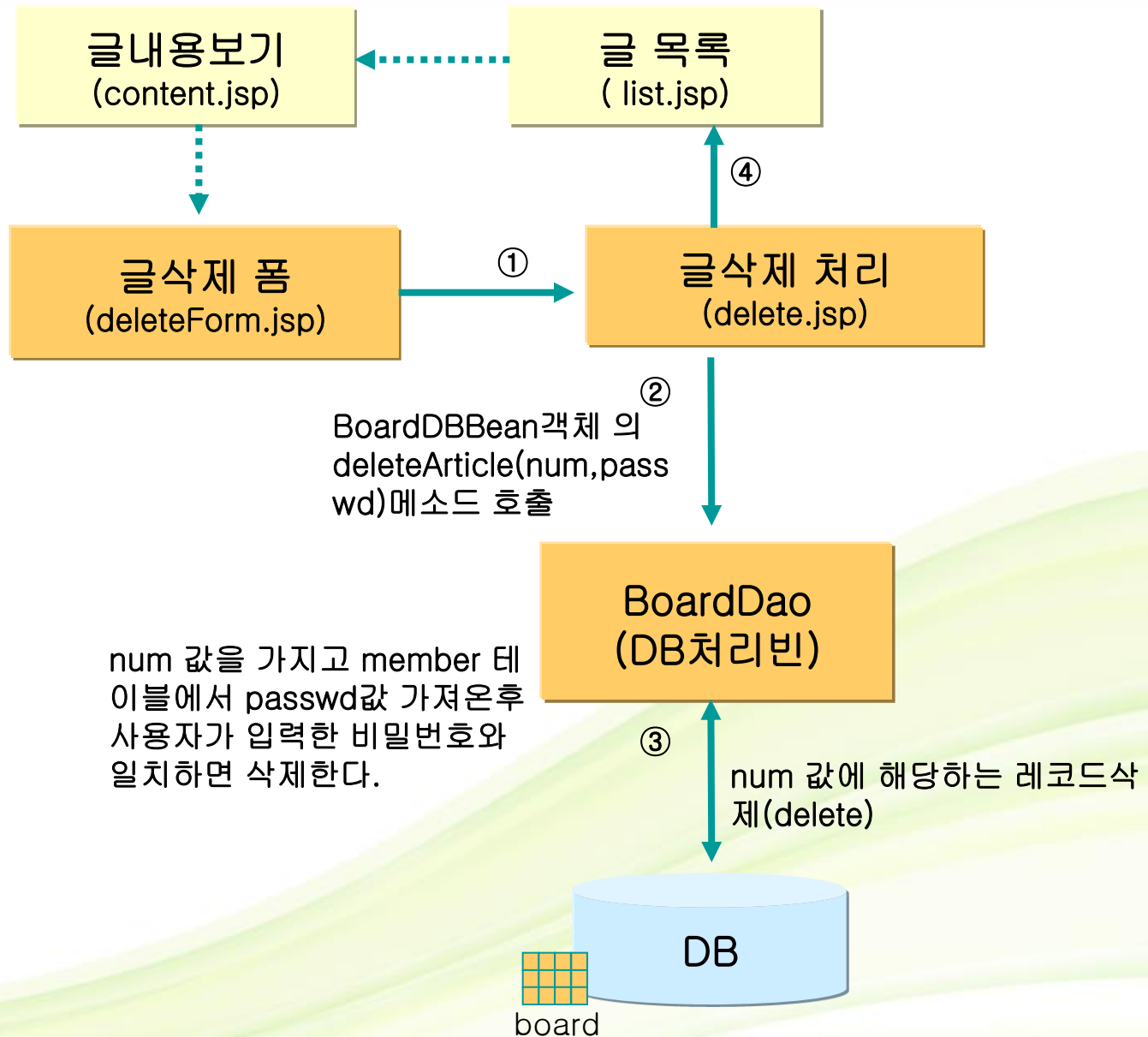
글내용 보기



글수정 처리



글삭제 처리



페이지	1	2	3	10	11	12	13	20	21
	233	223	213						
	232	222	212						
	225	215	205						
	224	214	204						
	1	페이지당 개수 10일 경우							
	1 - 10	11 - 20	21 - 30	91- 100	101- 110	111-120	121-130	191 200	201-210
시작번호	[페이지번호 - 1] * 페이지당 갯수+1								
끝번호	시작번호 + 페이지당개수 - 1								
페이지	Math.ceil(개수/페이지당 개수)								
블록	Math.ceil(페이지개수/블록당 개수)								
블록당 페이지수 : 10개									
시작	[현재페이지 - (현재페이지 - 1)% 블록당 갯수								
끝	시작페이지 + 블록당페이지 수 -1								

답변글

1. 번호는 입력 순서대로 1씩 증가
2. ref글을 처음입력하면 번호와 같다
3. 답글은 읽은글의 ref번호를 ref에 저장
4. re_level 첫번째는 0
답변글은 읽은글 re_level+1
5. re_step은 첫번째는 0
글을 읽고 ref가 같고 읽은글보다
re_step가 큰값이 있으면
그글의 re_step +1
답변글은 읽은글 re_step+1

답변글

번호	제목	내용	ref	re_step	re_level
1	세계평화		1	0	0
2	Java		2	0	0
3	점심식사				
4	밥은 먹니	1-1			
5	JSP는 언제	2-1	2	4	1
6	메뉴를 선정하자	3-1			
7	뭘 잡아	2-2	2	3	1
8	Spring은 언제	2-3	2	1	1
9	용수철 어쩔	2-3-1	2	2	2
10	끝났네	3-2	3	0+1	0+1

```
select * from board order by ref desc, re_step asc;
```

답변글

번호	제목	내용	ref	re_step	re_level
	점심식사		3	0	0
	끝났네	3-2	3	0+1	0+1
	메뉴를 선정하자	3-1	3	0+1+1	0+1
	Java		2	0	0
	Spring은 언제	2-3	2	0+1	0+1
	용수철 어쩔	2-3-1	2	0+1+1	0+1+1
	뭘 잡아	2-2	2	0+1+1+1	0+1
	JSP는 언제	2-1	2	0+1+1+1+1	0+1
	세계평화		1	0	0
	밥은 먹니	1-1	1	0+1	0+1

style.css

```
body { font-size: 9pt; }  
td { font-size : 9pt; }  
select font-size : 9pt; }  
form { font-size : 9pt; }
```

script.js

```
function writeSave(){  
    if(document.writeform.writer.value==""){ alert("작성자를 입력하십시오.");  
        document.writeform.writer.focus(); return false; }  
    if(document.writeform.subject.value==""){ alert("제목을 입력하십시오.");  
        document.writeform.subject.focus(); return false; }  
    if(document.writeform.content.value==""){ alert("내용을 입력하십시오.");  
        document.writeform.content.focus(); return false;  
    }  
    if(document.writeform.passwd.value==""){ alert(" 비밀번호를 입력하십시오.");  
        document.writeform.passwd.focus(); return false;  
    }  
}
```

color.jsp

```
<% String bodyback_c="#FFF0B5";  
    String value_c="#FFE271";  
%>
```

list.jsp

```
<%@ page language="java" contentType="text/html; charset=utf-8"
    pageEncoding="utf-8"%>
<%@ page import = "ch13.*,java.util.List,java.text.SimpleDateFormat" %>
<%@ include file="color.jsp"%>
<html><head><title>게시판</title>
<link href="style.css" rel="stylesheet" type="text/css">
<style type="text/css">
    body, td { text-align: center; }
    .left { text-align: left;}
</style></head>
<% int pageSize = 10;
    String pageNum = request.getParameter("pageNum");
    if (pageNum == null || pageNum.equals("")) { pageNum = "1"; }
    int currentPage = Integer.parseInt(pageNum);
    int startRow = (currentPage - 1) * pageSize + 1;
    int endRow = currentPage * pageSize;
    int count = 0; int number=0;
    List<Board> boardList = null;
    BoardDao dbPro = BoardDao.getInstance();
    count = dbPro.getBoardCount();
    if (count > 0) { boardList = dbPro.getBoards(startRow, pageSize); }
    number=count-(currentPage-1)*pageSize;
%>
```

```

<body bgcolor= "<%=bodyback_c%>">
<h2>글목록(전체 글:<%=count%>)</h2>
<table width= "700" align="center">
    <tr align= "right" bgcolor="<%=value_c%>"><td>
        <a href= "writeForm.jsp">글쓰기</a> </td></tr> </table>
<%   if (count == 0) {   %>
<table width= "700" border="1" align="center">
    <tr><td>게시판에 저장된 글이 없습니다.   </td></tr></table>
<%   } else {   %>
<table border= "1" width="700" align="center">
    <tr height= "30" bgcolor="<%=value_c%>"><th>번 호</th><th>제   목</th>
        <th>작성자</th><th>작성일</th><th>조 회</th>  <th>IP</th> </tr>
<%   for (int i = 0 ; i < boardList.size() ; i++) {
        Board board = (Board)boardList.get(i);
%>
    <tr height= "30"> <td> <%=number--%></td> <td width= "250" class="left" >
<%   int wid=0;
        if(board.getRe_level())>0){
            wid=5*(board.getRe_level());
%>
    <img src= "images/level.gif" width="<%=wid%>" height="16">
    <img src= "images/re.gif">
<%}else{%>
    <img src= "images/level.gif" width="<%=wid%>" height="16">
<%}%>

```

```

<a href="content.jsp?num=<%=board.getNum()%>&pageNum=<%=currentPage%>">
    <%=board.getSubject()%></a>
    <% if(board.getReadcount())>=20){%>
        <%}%> </td>
    <td><a href="mailto:<%=board.getEmail()%>"><%=board.getWriter()%></a></td>
    <td><%=board.getReg_date() %></td><td><%=board.getReadcount() %></td>
    <td><%=board.getIp()%></td> </tr>
    <%}%>
</table>
<% } %>
<% if (count > 0) {
    int pageCount=count/pageSize+(count%pageSize==0?0:1);
    int startPage = (int)((currentPage-1)/10)*10+1;    int pageBlock=10;
    int endPage = startPage + pageBlock-1;
    if (endPage > pageCount) endPage = pageCount;
    if (startPage > 10) {    %>
        <a href="list.jsp?pageNum=<%=startPage - 10 %>">[0|전]</a>
    <%
    }
    for (int i = startPage ; i <= endPage ; i++) {    %>
        <a href="list.jsp?pageNum=<%= i %>">[<%= i %>]</a><%
        }
    if (endPage < pageCount) {    %>
        <a href="list.jsp?pageNum=<%= startPage + 10 %>">[다음]</a><%
        }
    }
%>
</body></html>

```

writeForm.jsp

```
<%@ page language="java" contentType="text/html; charset=utf-8"
pageEncoding="utf-8"%>
<%@ include file="color.jsp" %><html><head><title>게시판</title>
<link href="style.css" rel="stylesheet" type="text/css">
<style type="text/css">
    body { text-align: center; }
    td { background-color: "<%=value_c%>"; }
</style><script type="text/javascript" src="script.js"></script></head>
<% int num=0,ref=1,re_step=0,re_level=0;
String pageNum = request.getParameter("pageNum");
if (pageNum == null || pageNum == "") { pageNum = "1"; }
if( request.getParameter("num")!=null){ // 답변글
    num=Integer.parseInt(request.getParameter("num"));
    ref=Integer.parseInt(request.getParameter("ref"));
    re_step=Integer.parseInt(request.getParameter("re_step"));
    re_level=Integer.parseInt(request.getParameter("re_level"));
}
%>
<body bgcolor="<%=bodyback_c%>"> <b>글쓰기</b><br>
<form method="post" action="writePro.jsp?pageNum=<%=pageNum%>"
    name="writeform" onsubmit="return writeSave()">
<input type="hidden" name="num" value="<%=num%>">
<input type="hidden" name="ref" value="<%=ref%>">
<input type="hidden" name="re_step" value="<%=re_step%>">
<input type="hidden" name="re_level" value="<%=re_level%>">
```



```

<table width= "400" border="1" align="center">
  <tr><td align= "right" colspan="2" bgcolor="<%=value_c%>">
    <a href= "/list.jsp"> 글목록</a></td></tr>
  <tr><td>이 름</td>
    <td><input type= "text" size="10" maxlength="10" name="writer"></td>
  </tr>
  <tr><td>제 목</td><td>
    <%if(request.getParameter("num")==null){%>
      <input type= "text" size="40" maxlength="50" name="subject">
    <%}else{%>
      <input type= "text" size="40" maxlength="50" name="subject"
        value= "[답변]"><%}%></td> </tr>
  <tr><td>Email</td><td>
    <input type= "text" size="40" maxlength="30" name="email" ></td>
  </tr>
  <tr><td>내 용</td><td>
    <textarea name= "content" rows="13" cols="40"></textarea> </td>
  </tr>
  <tr><td>비밀번호</td><td><input type= "password" size="8" maxlength="12"
    name="passwd">
  </td> </tr>
  <tr><td colspan=2>
    <input type= "submit" value="글쓰기" >
    <input type= "reset" value="다시작성">
    <input type= "button" value="목록보기"
      OnClick="window.location='list.jsp'">
  </td></tr></table> </form> </body></html>

```

writePro.jsp

```
<%@ page language="java" contentType="text/html; charset=EUC-KR"
    pageEncoding="EUC-KR"%>
<%@ page import = "ch13.BoardDao" %>
<% request.setCharacterEncoding("euc-kr");%>
<jsp:useBean id="board" class="ch13.Board"/>
<jsp:setProperty name="board" property="*" />
<%
    String pageNum = request.getParameter("pageNum");
    board.setIp(request.getRemoteAddr());
    BoardDao dbPro = BoardDao.getInstance();
    int result = dbPro.insert(board);
    if ( result > 0) {
        response.sendRedirect("list.jsp?pageNum="+pageNum);
    }
%>
<body>
<script type="text/javascript">
    alert("입력해 실패했습니다. 메세지 확인하세요");
    location.href = "writeForm.jsp";
</script>
</body>
```

content.jsp

```
<%@ page language="java" contentType="text/html; charset=EUC-KR"
    pageEncoding="EUC-KR"%>
<%@ page import = "ch13.*,java.text.SimpleDateFormat" %>
<%@ include file="color.jsp"%>
<html><head><title>게시판</title>
<link href="style.css" rel="stylesheet" type="text/css">
<style type="text/css">
body, td { text-align: center; }
td { background-color: "<%=value_c%>"; }
.left {text-align: left;}
</style></head>
<%  int num = Integer.parseInt(request.getParameter("num"));
    String pageNum = request.getParameter("pageNum");
    BoardDao dbPro = BoardDao.getInstance();
    Board board = dbPro.getBoard(num);

    int ref=board.getRef();
    int re_step=board.getRe_step();
    int re_level=board.getRe_level();
%>
```



```
<body bgcolor= "<%=bodyback_c%>"><h2>글내용 보기</h2>
<form>
<table width= "500" border= "1" bgcolor= "<%=bodyback_c%>" align= "center">
  <tr height= "30"><td>글번호</td> <td><%=board.getNum()%></td>
    <td>조회수</td><td><%=board.getReadcount()%></td></tr>
  <tr height= "30"> <td>작성자</td><td><%=board.getWriter()%></td>
    <td>작성일</td><td><%=board.getReg_date()%></td></tr>
  <tr height= "30"> <td>글제목</td><td colspan= "3">
    <%=board.getSubject()%></td> </tr>
  <tr><td>글내용</td><td colspan= "3" class= "left"><pre>
    <%=board.getContent()%> </pre></td></tr>
  <tr height= "30"><td colspan= "4" bgcolor= "<%=value_c%>" align= "right" >
    <input type= "button" value= "글수정"
onclick= "location.href='updateForm.jsp?num=<%=board.getNum()%>&pageNum
=<%=pageNum%>'">
    <input type= "button" value= "글삭제"
onclick= "location.href='deleteForm.jsp?num=<%=board.getNum()%>&pageNum
=<%=pageNum%>'">
    <input type= "button" value= "답글쓰기"
onclick= "location.href='writeForm.jsp?num=<%=num%>&ref=<%=ref%>&re_step
=<%=re_step%>&re_level=<%=re_level%>&pageNum=<%=pageNum%>'">
    <input type= "button" value= "글목록"
    onclick= "location.href='list.jsp?pageNum=<%=pageNum%>'">
  </td>
</tr>
</table> </form> </body></html>
```

updateForm.jsp

```
<%@ page language="java" contentType="text/html; charset=utf-8"
    pageEncoding="utf-8"%><%@ page import = "ch13.*" %>
<%@ include file="color.jsp"%>
<html><head><title>게시판</title>
<link href="style.css" rel="stylesheet" type="text/css">
<style type="text/css">
body, td { text-align: center; }
td { background-color: "<%=value_c%>"; }
</style>
<script type="text/javascript" src="script.js"></script>
</head>
<% int num = Integer.parseInt(request.getParameter("num"));
    String pageNum = request.getParameter("pageNum");
    BoardDao dbPro = BoardDao.getInstance();
    Board board = dbPro.updateGetBoard(num);
%>
```

```
<body bgcolor= "<%=bodyback_c%>"> <h2>글수정</h2>
<form method= "post" name= "writeform"
action= "updatePro.jsp?pageNum=<%=pageNum%>"
onsubmit= "return writeSave()">
<table width= "400" border= "1" bgcolor= "<%=bodyback_c%>" align= "center">
  <tr><td>이 름</td><td>
    <input type= "text" size= "10" maxlength= "10" name= "writer"
    value= "<%=board.getWriter()%>">
    <input type= "hidden" name= "num" value= "<%=board.getNum()%>"></td></tr>
  <tr><td>제 목</td><td>
    <input type= "text" size= "40" maxlength= "50" name= "subject"
    value= "<%=board.getSubject()%>"></td> </tr>
  <tr><td>Email</td><td>
    <input type= "text" size= "40" maxlength= "30" name= "email"
    value= "<%=board.getEmail()%>"></td> </tr>
  <tr><td>내 용</td><td>
    <textarea name= "content" rows= "13" cols= "40">
    <%=board.getContent()%></textarea></td> </tr>
  <tr><td>비밀번호</td><td>
    <input type= "password" size= "8" maxlength= "12" name= "passwd">
    </td> </tr>
  <tr><td colspan= 2> <input type= "submit" value= "글수정" >
    <input type= "reset" value= "다시작성"><input type= "button" value= "목록보기"
    onclick= "location.href='list.jsp?pageNum=<%=pageNum%>'">
    </td></tr>
</table></form></body></html>
```

updatePro.jsp

```
<%@ page language="java" contentType="text/html; charset=utf-8"
    pageEncoding="utf-8" import="ch13.BoardDao" %>
<% request.setCharacterEncoding("utf-8");%>
<jsp:useBean id="board" class="ch13.Board"/>
<jsp:setProperty name="board" property="*/>
<% String pageNum = request.getParameter("pageNum");
BoardDao dbPro = BoardDao.getInstance();
    int check = dbPro.update(board);

    if(check > 0){
        response.sendRedirect("list.jsp?pageNum="+ pageNum);
    } else { %>
        <script type="text/javascript">
            alert("비밀번호가 맞지 않습니다");
            history.go(-1);
        </script>
    <% } %>
```

deleteForm.jsp

```
<%@ page language="java" contentType="text/html; charset=utf-8"
    pageEncoding="utf-8"%>
<%@ include file="color.jsp"%>
<% int num = Integer.parseInt(request.getParameter("num"));
    String pageNum = request.getParameter("pageNum");
%>
<html><head><title>게시판</title>
<link href="style.css" rel="stylesheet" type="text/css">
<style type="text/css">
body, td { text-align: center; }
td { background-color: "<%=value_c%>"; }
</style>
<script type="text/javascript">
    function deleteSave(){
if(delForm.passwd.value==''){ alert("비밀번호를 입력하십시오.");
delForm.passwd.focus();
return false;
}
}
</script></head>
```

```
<body bgcolor= "<%=bodyback_c%>">
<h2>글삭제</h2>
<form method= "POST" name= "delForm"
action= "deletePro.jsp?pageNum=<%=pageNum%>"
onsubmit= "return deleteSave()">
<table border= "1" align= "center" width= "360">
<tr height= "30">
<td><b>비밀번호를 입력해 주세요.</b></td></tr>
<tr height= "30"> <td>비밀번호 :
<input type= "password" name= "passwd" size= "8" maxlength= "12">
<input type= "hidden" name= "num" value= "<%=num%>"></td>
</tr>
<tr height= "30"><td>
<input type= "submit" value= "글삭제" >
<input type= "button" value= "글목록"
onclick= "location.href='list.jsp?pageNum=<%=pageNum%>'">
</td> </tr></table>
</form>
</body>
</html>
```


deletePro.jsp

```
<%@ page language="java" contentType="text/html; charset=utf-8"
    pageEncoding="utf-8"%>
<%@ page import = "ch13.BoardDao" %>
<% request.setCharacterEncoding("euc-kr");%>
<% int num = Integer.parseInt(request.getParameter("num"));
    String pageNum = request.getParameter("pageNum");
    String passwd = request.getParameter("passwd");

    BoardDao dbPro = BoardDao.getInstance();
    int check = dbPro.delete(num, passwd);
    if(check > 0 ){
        response.sendRedirect("list.jsp?pageNum="+pageNum);
    } else { %>
        <script type="text/javascript">
            alert("비밀번호가 맞지 않습니다");
            history.go(-1);
        </script>
    <% } %>
```

addData.jsp

```
<%@page import="ch13.Board,ch13.BoardDao"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html><head><meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
<title>Insert title here</title></head><body><h1>데이터 추가</h1>
<% BoardDao bd = BoardDao.getInstance();
    Board board = new Board();
    for (int i = 0 ; i < 100; i++) {
        board.setWriter("철"+i);
        board.setSubject("대박"+i);
        board.setContent("쪽박이냐"+i);
        board.setEmail("kk@k.com"+i);
        board.setPasswd("1");
        board.setNum(0);
        board.setIp("127.0.0.1");
        bd.insert(board);
    }
%>
와우 성공이다
</body>
</html>
```


Board.java

```
package ch13; import java.sql.Date;  
public class Board {  
    private int num; private String writer; private String subject;  
    private String content; private String email; private int readcount;  
    private String passwd; private int ref; private int re_step;  
    private int re_level; private String ip; private Date reg_date;  
  
    public int getNum() {return num;}  
    public void setNum(int num) {this.num = num;}  
  
    public String getWriter() {return writer;}  
    public void setWriter(String writer) {this.writer = writer;}  
  
    public String getSubject() {return subject;}  
    public void setSubject(String subject) {this.subject = subject;}  
  
    public String getContent() {return content;}  
    public void setContent(String content) {this.content = content;}  
  
    public String getEmail() {return email;}  
    public void setEmail(String email) {this.email = email;}  
  
    public int getReadcount() {return readcount;}  
    public void setReadcount(int readcount) { this.readcount=readcount;}
```

```
public String getPasswd() {return passwd;}  
public void setPasswd(String passwd) {  
    this.passwd = passwd;  
}
```

```
public int getRef() {return ref;}  
public void setRef(int ref) {this.ref = ref;}
```

```
public int getRe_step() {return re_step;}  
public void setRe_step(int re_step) {  
    this.re_step = re_step;  
}
```

```
public int getRe_level() {return re_level;}  
public void setRe_level(int re_level) {  
    this.re_level = re_level;  
}
```

```
public String getIp() {return ip;}  
public void setIp(String ip) {this.ip = ip;}
```

```
public Date getReg_date() {return reg_date;}  
public void setReg_date(Date reg_date) {  
    this.reg_date = reg_date;  
}
```

```
}
```

BoardDao.java

```
package ch13;
import java.sql.*;
import java.util.ArrayList;
import java.util.List;
import javax.sql.*;
import javax.naming.*;
public class BoardDao {
    private static BoardDao instance;
    private BoardDao() {}
    public static BoardDao getInstance() {
        if (instance == null) {      instance = new BoardDao();      }
        return instance;
    }
    private Connection getConnection() {
        Connection conn = null;
        try {
            Context init = new InitialContext();
            DataSource ds = (DataSource)
                init.lookup("java:comp/env/jdbc/OracleDB");
            conn = ds.getConnection();
        } catch (Exception e) {      System.out.println(e.getMessage());      }
        return conn;
    }
}
```

```
public int getBoardCount() throws Exception {  
    Connection conn = null; PreparedStatement pstmt = null;  
    ResultSet rs = null; int count = 0;  
    try { conn = getConnection();  
        pstmt = conn.prepareStatement("select count(*) from board");  
        rs = pstmt.executeQuery();  
        if (rs.next()) { count = rs.getInt(1); }  
    } catch(Exception e) {System.out.println(e.getMessage());  
    } finally {  
        if (rs != null) try { rs.close(); } catch(SQLException ex) {}  
        if (pstmt != null) try { pstmt.close(); } catch(SQLException ex) {}  
        if (conn != null) try { conn.close(); } catch(SQLException ex) {}  
    }  
    return count;  
}
```

```
public List<Board> getBoards(int start, int end) throws Exception {  
    Connection conn = null;  
    PreparedStatement pstmt = null;  
    ResultSet rs = null;  
    List<Board> boardList = null;  
    String sql = "select * from (select rownum rn, a.* from "  
    + "(select * from board order by ref desc,re_step asc) a)"  
    + "where rn between ? and ?";
```

```
try {      conn = getConnection();
    pstmt = conn.prepareStatement(sql);
    int k = start + end - 1 ;
    pstmt.setInt(1, start);pstmt.setInt(2, k);
    rs = pstmt.executeQuery();
    if (rs.next()) {
        boardList = new ArrayList<Board>();
        do{   Board board= new Board();
            board.setNum(rs.getInt("num"));
            board.setWriter(rs.getString("writer"));
            board.setEmail(rs.getString("email"));
            board.setSubject(rs.getString("subject"));
            board.setPasswd(rs.getString("passwd"));
            board.setReg_date(rs.getDate("reg_date"));
            board.setReadcount(rs.getInt("readcount"));
            board.setRef(rs.getInt("ref"));
            board.setRe_step(rs.getInt("re_step"));
            board.setRe_level(rs.getInt("re_level"));
            board.setContent(rs.getString("content"));
            board.setIp(rs.getString("ip"));

            boardList.add(board);
        }while(rs.next());
    }
}
```

```
} catch(Exception e) {System.out.println(e.getMessage());  
} finally {  
    if (rs != null) try { rs.close(); } catch(SQLException ex) {}  
    if (pstmt != null) try { pstmt.close(); } catch(SQLException ex) {}  
    if (conn != null) try { conn.close(); } catch(SQLException ex) {}  
}  
return boardList;  
}  
  
public int insert(Board board) throws Exception {  
    Connection conn = null;  
    PreparedStatement pstmt = null;  
    ResultSet rs = null;  
    int result = -1;  
    int num=board.getNum();  
    int ref=board.getRef();  
    int re_step=board.getRe_step();  
    int re_level=board.getRe_level();  
    int number=0;    String sql="";  
    try { conn = getConnection();  
        pstmt = conn.prepareStatement("select max(num) from board");  
        rs = pstmt.executeQuery();  
        if (rs.next()) number=rs.getInt(1)+1;  
        else    number=1;  
        pstmt.close();
```



```

if (num!=0)    { // 답변글
    sql="update board set re_step=re_step+1 where ref = ? and re_step > ?";
    pstmt = conn.prepareStatement(sql);
    pstmt.setInt(1, ref);  pstmt.setInt(2, re_step);  pstmt.executeUpdate();
    re_step = re_step + 1; re_level = re_level + 1;    pstmt.close();
}else{ ref = number; re_step=0; re_level=0;  }
sql = "insert into board(num,writer,email,subject,passwd,reg_date,ref," +
    "re_step,re_level,content,ip) values(?,?,?,?,?,sysdate,?,?,?,?,?)";
pstmt = conn.prepareStatement(sql);
pstmt.setInt(1, number);    pstmt.setString(2, board.getWriter());
pstmt.setString(3, board.getEmail());
pstmt.setString(4, board.getSubject());
pstmt.setString(5, board.getPasswd());
pstmt.setInt(6, ref);  pstmt.setInt(7, re_step);
pstmt.setInt(8, re_level); pstmt.setString(9, board.getContent());
pstmt.setString(10, board.getIp());
result = pstmt.executeUpdate();
} catch(Exception e) { System.out.println(e.getMessage());
} finally {
    if (rs != null) try { rs.close(); } catch(SQLException ex) {}
    if (pstmt != null) try { pstmt.close(); } catch(SQLException ex) {}
    if (conn != null) try { conn.close(); } catch(SQLException ex) {}
}
return result;
}

```

```
public Board updateGetBoard(int num) throws Exception {
    Connection conn = null;    PreparedStatement pstmt = null;
    ResultSet rs = null;        Board board = new Board();
    String sql = "select * from board where num =" + num;
    try { conn = getConnection();  pstmt = conn.prepareStatement(sql);
        rs = pstmt.executeQuery();
        if (rs.next()) { board.setNum(rs.getInt("num"));
            board.setWriter(rs.getString("writer"));
            board.setEmail(rs.getString("email"));
            board.setSubject(rs.getString("subject"));
            board.setPasswd(rs.getString("passwd"));
            board.setReg_date(rs.getDate("reg_date"));
            board.setReadcount(rs.getInt("readcount"));
            board.setRef(rs.getInt("ref"));
            board.setRe_step(rs.getInt("re_step"));
            board.setRe_level(rs.getInt("re_level"));
            board.setContent(rs.getString("content"));
            board.setIp(rs.getString("ip"));
        }
        pstmt.close();
    } catch (Exception e) {System.out.println(e.getMessage());
    } finally {    if (rs != null) try { rs.close(); } catch (SQLException ex) {}
        if (pstmt != null) try { pstmt.close(); } catch (SQLException ex) {}
        if (conn != null) try { conn.close(); } catch (SQLException ex) {}
    }
    return board;
}
```



```
public Board getBoard(int num) throws Exception {
    Connection conn = null;    PreparedStatement pstmt = null;
    ResultSet rs = null;
    Board board = updateGetBoard(num);
    String sql1 = "update board set readcount = readcount + 1 " +
    " where num=" + num;
    try { conn = getConnection();
        pstmt = conn.prepareStatement(sql1);
        pstmt.executeUpdate();
    } catch(Exception e) {System.out.println(e.getMessage());}
    } finally {
        if (rs != null) try { rs.close(); } catch(SQLException ex) {}
        if (pstmt != null) try { pstmt.close(); } catch(SQLException ex) {}
        if (conn != null) try { conn.close(); } catch(SQLException ex) {}
    }
    return board;
}
```

```
public int update(Board board) throws Exception {
    Connection conn = null;    PreparedStatement pstmt = null;
    ResultSet rs = null;        int result = -1;
    int num=board.getNum(); String passwd = board.getPasswd();
    String sql1 = "select passwd from board where num=" + num;
    String sql2 = "update board set writer=?,email=?,subject=?, "+
        "reg_date=sysdate,content=? where num=?";
    try { conn = getConnection();    pstmt = conn.prepareStatement(sql1);
        rs = pstmt.executeQuery();
        if (rs.next()) { String dbPasswd = rs.getString(1);
            if (dbPasswd.equals(passwd)) {
                pstmt.close();
                pstmt = conn.prepareStatement(sql2);
                pstmt.setString(1, board.getWriter());
                pstmt.setString(2, board.getEmail());
                pstmt.setString(3, board.getSubject());
                pstmt.setString(4, board.getContent());    pstmt.setInt(5, num);
                result = pstmt.executeUpdate();
            } else { result = -1; }
        }
    } catch(Exception e) { System.out.println(e.getMessage());
    } finally {    if (rs != null) try { rs.close(); } catch(SQLException ex) {}
        if (pstmt != null) try { pstmt.close(); } catch(SQLException ex) {}
        if (conn != null) try { conn.close(); }    catch(SQLException ex) {}
    }
    return result;
}
```

```
public int delete(int num, String passwd) throws Exception {  
    Connection conn = null; PreparedStatement pstmt = null;  
    ResultSet rs = null; int result = -1;  
    String sql1 = "select passwd from board where num=" + num;  
    String sql2 = "delete from board where num=" + num;  
    try { conn = getConnection();  
        pstmt = conn.prepareStatement(sql1);  
        rs = pstmt.executeQuery();  
        if (rs.next()) {  
            String dbPasswd = rs.getString(1);  
            if (dbPasswd.equals(passwd)) {  
                pstmt.close();  
                pstmt = conn.prepareStatement(sql2);  
                result = pstmt.executeUpdate();  
            } else { result = -1; }  
        }  
    } catch (Exception e) { System.out.println(e.getMessage());  
    } finally {  
        if (rs != null) try { rs.close(); } catch (SQLException ex) {}  
        if (pstmt != null) try { pstmt.close(); } catch (SQLException ex) {}  
        if (conn != null) try { conn.close(); } catch (SQLException ex) {}  
    }  
    return result;  
}
```

답변 글의 순서를 최신 글 순서

아래 상태가 원하는 형태이고 이 상태에서 설명합니다.

번호	REF	STEP	LVL	제목
2	2	0	0	2
3	2	1	1	_2-1
5	2	2	2	__2-1-1
7	2	3	3	___2-1-1-1
4	2	4	1	_2-2
6	2	5	2	__2-2-1
1	1	0	0	1

위 상태에서 답변을 할때 배치될 위치를 찾아보면 두 가지 형태로 구분됩니다.

2,4,6번글에 답변을 하면 6,1번글 사이에 배치되면 됩니다.

3,5,7번글에 답변을 하면 7,4번글 사이에 배치되면 됩니다.

조금 바꿔 말하면

2,4,6번글에 답변을 하면 마지막 STEP 다음으로 들어가면 됩니다.

3,5,7번글에 답변을 하면 4번글의 STEP으로 끼어 들어가면 됩니다

답변 글의 순서를 최신 글 순서

코딩하는 식으로 설명하면

2,4,6번글에 답변을 하면 최대STEP에 +1한 후 현재STEP으로 세팅해서 등록하면 됩니다.

3,5,7번글에 답변을 하면 4번글의 STEP보다 크거나 같은 글들의 STEP을 +1하고 현재STEP을 4번글의 STEP으로 세팅해서 등록하면 됩니다.

이제 해결할게 2,4,6번글과 3,5,7번글을 구분하는 방법과 4번글 STEP을 찾을 수 있으면 되는데

아래 SQL으로 구분하고 찾을 수 있습니다.

```
select min(STEP) from BOARD  
where REF = 부모REF  
and STEP > 부모STEP  
and LVL <= 부모LVL
```

이 쿼리 결과가 null이면 2,4,6번글 형태(맨 밑으로 가는)이고
null이 아니면 3,5,7번글 형태(중간에 끼어 들어가는)이며 결과가 4번글의
STEP이 됩니다.

step = 결과STEP;

답변 글의 순서를 최신 글 순서

```
if (step != null) {  
    // 중간에 끼어 들어가는 형태  
    update BOARD      set STEP = STEP + 1  
    where REF = 부모REF    and STEP >= step  
  
    board.setRe_step(temp_step);  
} else {  
    // 맨 밑으로 가는 형태  
    select max(STEP) + 1    from BOARD  
    where REF = 부모REF  
  
    step = 결과STEP;  
}
```

lvl = 부모 level + 1;

이렇게 처리 후 insert하면 하단으로 답변이 배치됩니다.

BoardDao변경

```
public int insert(Board board) {  
    int result = 0, number=0; Connection conn = null;  
    PreparedStatement pstmt = null; ResultSet rs = null;  
    String sql = "insert into board2 values(?,?,?,?,?, "  
        + "0,?,?,?,?,?,sysdate,'n')";  
    String sql1 = "select nvl(max(num),0)+1 from board2";  
    String sqlChk = "select min(re_step) from board2 "  
        + "where ref=? and re_step > ? and re_level <= ?";  
    String sqlStep = "select max(re_step) + 1 from board2 "  
        + " where ref=?";  
    String sql2 = "update board2 set re_step = re_step+1 "  
        + "where ref=? and re_step >= ?";  
    try{  
        conn = getConnection();  
        pstmt = conn.prepareStatement(sql1);  
        rs = pstmt.executeQuery();  
        if (rs.next()) number = rs.getInt(1);  
        pstmt.close();  
        rs.close();
```


BoardDao변경

```
if (board.getNum() != 0) {
    pstmt = conn.prepareStatement(sqlChk);
    pstmt.setInt(1, board.getRef());
    pstmt.setInt(2, board.getRe_step());
    pstmt.setInt(3, board.getRe_level());
    rs = pstmt.executeQuery();
    rs.next(); String step = rs.getString(1);
    if (step != null) {
        int temp_step = Integer.parseInt(step);
        pstmt.close();
        pstmt = conn.prepareStatement(sql2);
        pstmt.setInt(1, board.getRef());
        pstmt.setInt(2, temp_step); pstmt.executeUpdate();
        board.setRe_step(temp_step);
    } else { pstmt.close();
        pstmt = conn.prepareStatement(sqlStep);
        pstmt.setInt(1, board.getRef());
        rs = pstmt.executeQuery();
        rs.next(); board.setRe_step(rs.getInt(1));
        rs.close();
    }
    pstmt.close();
    board.setRe_level(board.getRe_level()+1);
} else { board.setRef(number); }
```


BoardDao변경

```
pstmt = conn.prepareStatement(sql);
pstmt.setInt(1, number);
pstmt.setString(2, board.getWriter());
pstmt.setString(3, board.getSubject());
pstmt.setString(4, board.getContent());
pstmt.setString(5, board.getEmail());
pstmt.setString(6, board.getPasswd());
pstmt.setInt(7, board.getRef());
pstmt.setInt(8, board.getRe_step());
pstmt.setInt(9, board.getRe_level());
pstmt.setString(10, board.getIp());

result = pstmt.executeUpdate();
} catch (Exception e) { System.out.println(e.getMessage());
} finally {
    try{
        if (rs !=null) rs.close();
        if (pstmt !=null) pstmt.close();
        if (conn !=null) conn.close();
    } catch (Exception e) {}
}
return result;
}
```