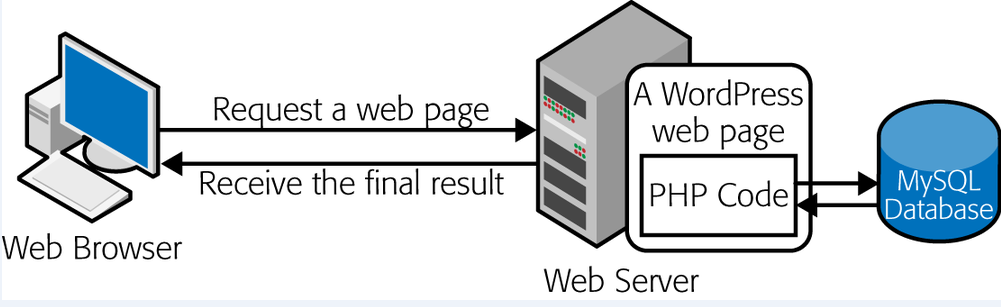
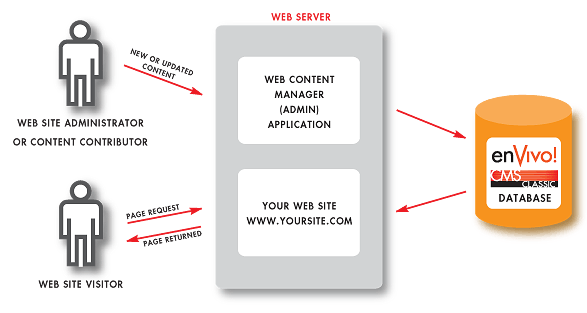
* **What is Database Management System?**

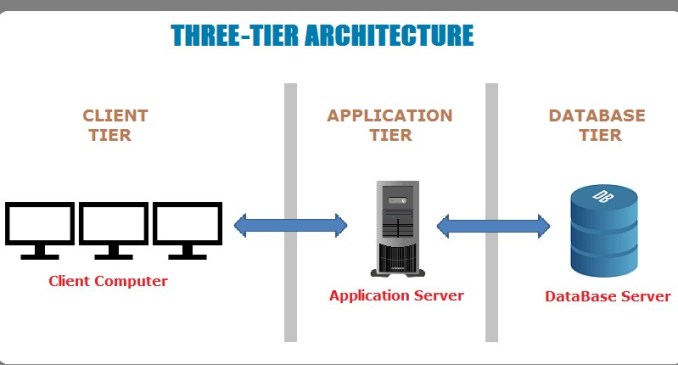
A database management system (**DBMS**) is software for creating and managing databases. The **DBMS** provides users and programmers with a systematic way to create, retrieve, update and manage data.

* **Application of DBMS?**
* **Banking :**for customer information, accounts and loans and banking transactions.
* **Universities :**for student registrations and grades.
* **Online shopping :** Purchase information, invoice bills and payment, all of these are done with the help of DBMS.
* **Airlines :**for reservations and schedule information.
* **Library Management System :**maintain all the information relate to book issue dates, name of the book, author and availability of the book.
* **How Database Work**

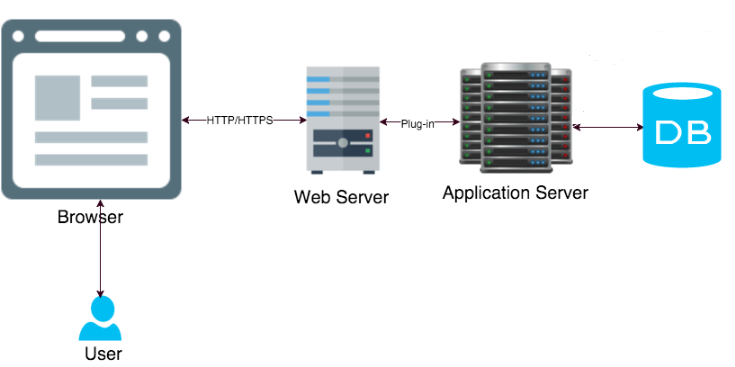




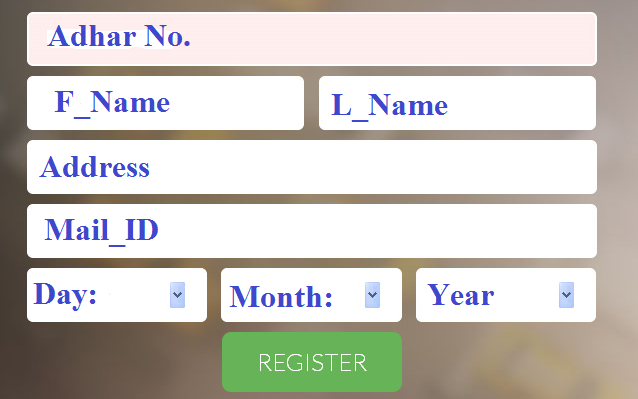
* **Three tier architecture (Web Applications) in DBMS:**



* **Web server and Application Server**
* A **Web server** is a program that uses HTTP to serve the files that form Web pages to users, in response to their requests.
* An **Application server** is a software framework that provides the facilities to create web applications.



* **How Database Implementation in a project**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Adhar No. | F\_Name | L\_Name | Address | Mail\_ID | DOB |
| 101 | Amitava | Halder | Howrah | xyz@gmail.com | 14/1/1982 |
| 102 | Manab | Das | Kolkata | pqr@ gmail.com | 01/10/1983 |
| 103 | Sathi | Roy | Howrah | abc@gmail.com | 21/7/1993 |
| 104 | Joy | Chatterjee | Hooghly | mnogmail.com | 27/6/1990 |

* **Major functions of DBMS:**

DBMS is designed to store and manages databases.

DBMS Functions

Stores Data

Updates Data

Retrieves data

Delete Data

* **SQL Commands**:
* Data Definition Language: DDL statements used to create or alter the structure of a database.

Example: CREATE-To create the object in the database.

ALTER-Alter the structure (add, modify, drop, rename) of the database.

DROP- Delete the object from the database.

RENAME- Rename the object.

* Data Manipulation Language: DML statements used to manipulation or modification of records/rows in the table.

Example: INSERT- Insert data into a table.

SELECT-Retrieve the data from the database.

UPDATE-Update existing data with in a table.

DELETE- Delete records from a table.

* Data type
* Key Concept

Employee

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **E\_Id#** | **E\_Code** | **Name** | **Sal** | **D\_No** | **A\_No** |
| 101 | E02 | Ram | 400.50 | D1 | A11 |
| 102 | E04 | Kalu | 450 | D2 | A13 |
| 103 | E05 | Roni | 475.50 | D2 | A04 |
| 104 | E04 | Halu | 230.50 | D1 | A09 |

Department

|  |  |  |
| --- | --- | --- |
| **D\_No#** | **D\_Name** | **D\_Loc** |
| D1 | Acc | Ban |
| D2 | Dev | Del |
| D3 | Mkt | Kol |

**{E\_Id}**

**{E\_Code}**

**{ E\_Id}**

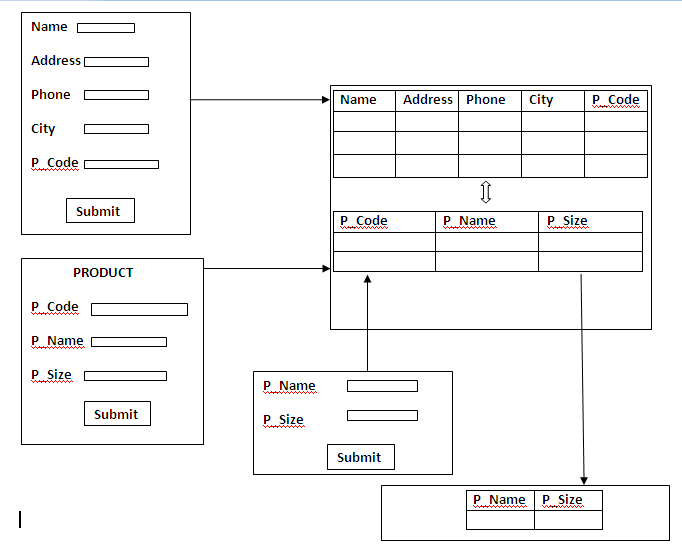
**{E\_Code}**

**{E\_ID,E\_Code}**

**{E\_Id,E\_Code,Name}**

**{D\_No}, {A\_No}**

**{E\_Id}**



Command to create table employee:

SQL> Create table employee (E\_id number (10) primary key,

E\_Code varchar (15) unique,

E\_Name varchar (20) not null,

E\_City varchar (10),

Salary number (7,2) not null,

D\_No varchar(5));

SQL>**INSERT INTO TABLE employee values (101,’E02’,’AA’,’KOL’,500.50,’D01’)**

**SQL> INSERT INTO TABLE employee (E\_id, E\_Code, E\_Name, Salary, D\_No) values**

**(102,’E03’,’BB’,500.50,’D02’)**

SQL>**SELECT \* FROM employee**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| E\_id | E\_Code | E\_Name | E\_City | Salary | D\_No |
| 101 | E02 | AA | KOL | 500.50 | D01 |
| 102 | E03 | BB |  | 500.50 | D02 |

SQL>**SELECT E\_id, E\_Name from employee where E\_City=’KOL’**

|  |  |
| --- | --- |
| E\_id | E\_Name |
| 101 | AA |

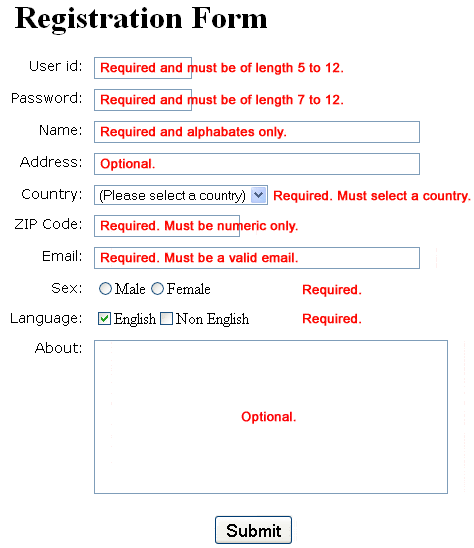
SQL**>UPDATE employee SET E\_City = ‘HOW’, Salary = 600.50 WHERE E\_id=101;**

SQL>**SELECT \* FROM employee**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| E\_id | E\_Code | E\_Name | E\_City | Salary | D\_No |
| 101 | E02 | AA | HOW | 600.50 | D01 |
| 102 | E03 | BB |  | 500.50 | D02 |

**Various Key constraints:**

**Constraints** enforce limits to the data or type of data that can be inserted/updated/deleted from a table. The whole purpose of constraints is to maintain the **data integrity**during an update/delete/insert into a table.



1. **NOT NULL:**

NOT NULL constraint makes sure that a column does not hold NULL value. When we don’t provide value for a particular column while inserting a record into a table, it takes NULL value by default. By specifying NULL constraint, we can be sure that a particular column(s) cannot have NULL values.

CREATE TABLE STUDENT(

ROLL\_NO INT **NOT NULL**,

STU\_NAME VARCHAR (35) **NOT NULL**,

STU\_AGE INT **NOT NULL**,

STU\_ADDRESS VARCHAR (235),

PRIMARY KEY (ROLL\_NO)

);

#### UNIQUE:

UNIQUE Constraint enforces a column or set of columns to have unique values. If a column has a unique constraint, it means that particular column cannot have duplicate values in a table.

CREATE TABLE STUDENT(

ROLL\_NO INT NOT NULL,

STU\_NAME VARCHAR (35) NOT NULL **UNIQUE**,

STU\_AGE INT NOT NULL,

STU\_ADDRESS VARCHAR (35) **UNIQUE**,

PRIMARY KEY (ROLL\_NO)

);

#### CHECK:

This constraint is used for specifying range of values for a particular column of a table. When this constraint is being set on a column, it ensures that the specified column must have the value falling in the specified range.

CREATE TABLE STUDENT(

ROLL\_NO   INT  NOT NULL CHECK(ROLL\_NO >1000) ,

STU\_NAME VARCHAR (35)  NOT NULL,

STU\_AGE INT  NOT NULL,

EXAM\_FEE INT DEFAULT 10000,

STU\_ADDRESS VARCHAR (35) ,

PRIMARY KEY (ROLL\_NO)

);

#### PRIMARY KEY:

[Primary key](https://beginnersbook.com/2015/04/primary-key-in-dbms/) uniquely identifies each record in a table. It must have unique values and cannot contain nulls. In the below example the ROLL\_NO field is marked as primary key, that means the ROLL\_NO field cannot have duplicate and null values.

CREATE TABLE STUDENT(

ROLL\_NO   INT  NOT NULL,

STU\_NAME VARCHAR (35)  NOT NULL UNIQUE,

STU\_AGE INT NOT NULL,

STU\_ADDRESS VARCHAR (35) UNIQUE,

**PRIMARY KEY** (ROLL\_NO)

);

#### v. FOREIGN KEY:

Foreign keys are the columns of a table that points to the primary key of another table. They act as a cross-reference between tables.

**Some Example:**

1. SELECT DISTINCT column\_name(s) FROM table\_name
2. SELECT column\_name(s) FROM table\_name WHERE <Condition>
3. SELECT column\_name(s) FROM table\_name ORDER BY column\_name(s)
4. UPDATE table\_name SET column1=value, column2=value2,... WHERE some\_column = some\_value
5. Relational Operator
6. select count (\*) from emp;
7. ALTER TABLE <TABLE NAME> ADD <attribute name along with data type and size>
8. ALTER TABLE<TABLE NAME>DROP<Attribute name>
9. ALTER TABLE <TNAME> CHANGE ‘old attribute’ ‘new attribute’ type(size) not null
10. And, OR, In, Not in, Between (select name,sal from emp. Where sal between 20 and 50)
11. Like Operator
12. Max, Min, Avg., Sum function
13. create a new table from existing table

CREATE TABLE new\_table

SELECT col1, col2, col3

FROM

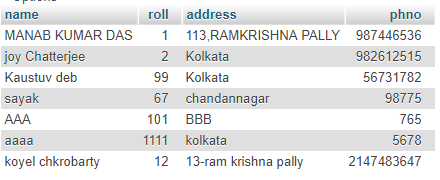
    existing\_table

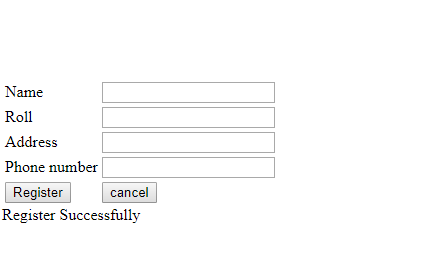
WHERE

    conditions;

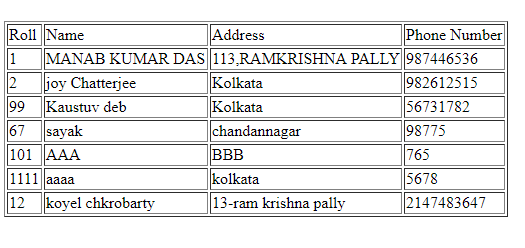
1. select deptno,count(\*) total\_emp from emp group by deptno;
2. select count (\*) no\_of\_emp from emp where salary<(select avg(salary) from emp);
3. select name,salary from employee where name like 'R%' and salary>500 and salary<(select avg(salary) from employee);

**Example-1:**





<http://localhost/dbms\_test/register.php>



<?php

if($\_GET)

{ < http://localhost/dbms\_test/show.php>

$con=mysqli\_connect("localhost","root","","skfgi1");

$name=$\_GET['n1'];

$roll=$\_GET['n2'];

$addr=$\_GET['n3'];

$pno=$\_GET['n4'];

$sql="INSERT INTO student(`name`, `roll`, `address`, `phno`) VALUES('$name','$roll','$addr','$pno')";

if(mysqli\_query($con,$sql))

{

print "Register Successfully";

}

else

{

print "Not Register Successfully";

}

mysqli\_close($con);

}

?>

<?php

$con=mysqli\_connect("localhost","root","","skfgi1");

$sql="SELECT \* FROM student ";

$row=mysqli\_query($con,$sql);

print "<table border=1>";

print "<td>Roll</td><td>Name</td><td>Address</td><td>Phone Number</td></tr>";

while($r=mysqli\_fetch\_assoc($row))

{

print "<tr>";

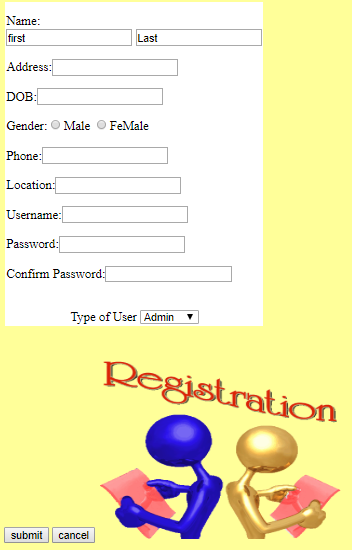
print "<td>".$r['roll']."</td><td>".$r['name']."</td><td>".$r['address']."</td><td>".$r['phno']."</td></tr>";

}

print "</table>";

mysqli\_close($con);

**Example-2: On line Library Management System**



<?php

if(!empty($\_POST['p1']))

<?php

$con = mysqli\_connect("localhost","root","","skfgi\_library");

?>

{

include\_once("database\_connection.php");

$N=$\_POST['n1'];

$l=$\_POST['n2'];

$Name=$N." ".$l;

$Address=$\_POST['n3'];

$DOB=$\_POST['n4'];

$Gender=$\_POST['n5'];

$Phone=$\_POST['n6'];

$Location=$\_POST['n7'];

$Username=$\_POST['n8'];

$Password=$\_POST['n9'];

$Confirm\_Password=$\_POST['n10'];

$tou=$\_POST['s'];

$sql="insert into user\_details(Name,Address,Dob,Username,Password,tou,location,Gender,Phone) values('$Name','$Address','$DOB','$Username','$Password','$tou','$Location','$Gender',$Phone)";

if(!mysqli\_query($con,$sql))

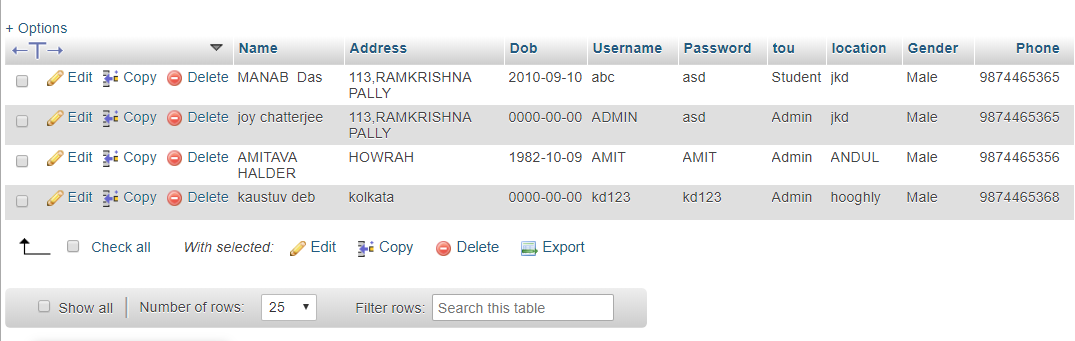
{

die("Give different username");

}

}

?>





<?php

include\_once("database\_connection.php");

if(!empty($\_POST['submit']))

{

$User\_Name=$\_POST['n1'];

$Password=$\_POST['n2'];

$user=$\_POST['p1'];

$sql=mysqli\_query($con,"select Password,tou from user\_details where Username='$User\_Name'");

while($row=mysqli\_fetch\_row($sql))

{

if(strcmp($row[0],$Password)==0)

{

if(strcmp($row[1],$user)==0 && strcmp($user,"Student")==0)

{

header("location:home\_page.html");

}

elseif(strcmp($row[1],$user)==0 && strcmp($user,"Admin")==0)

{

header("location:home\_page\_Admin.html");

}

echo "Wrong User";

}

else

echo "Wrong Password";

}

} ?>

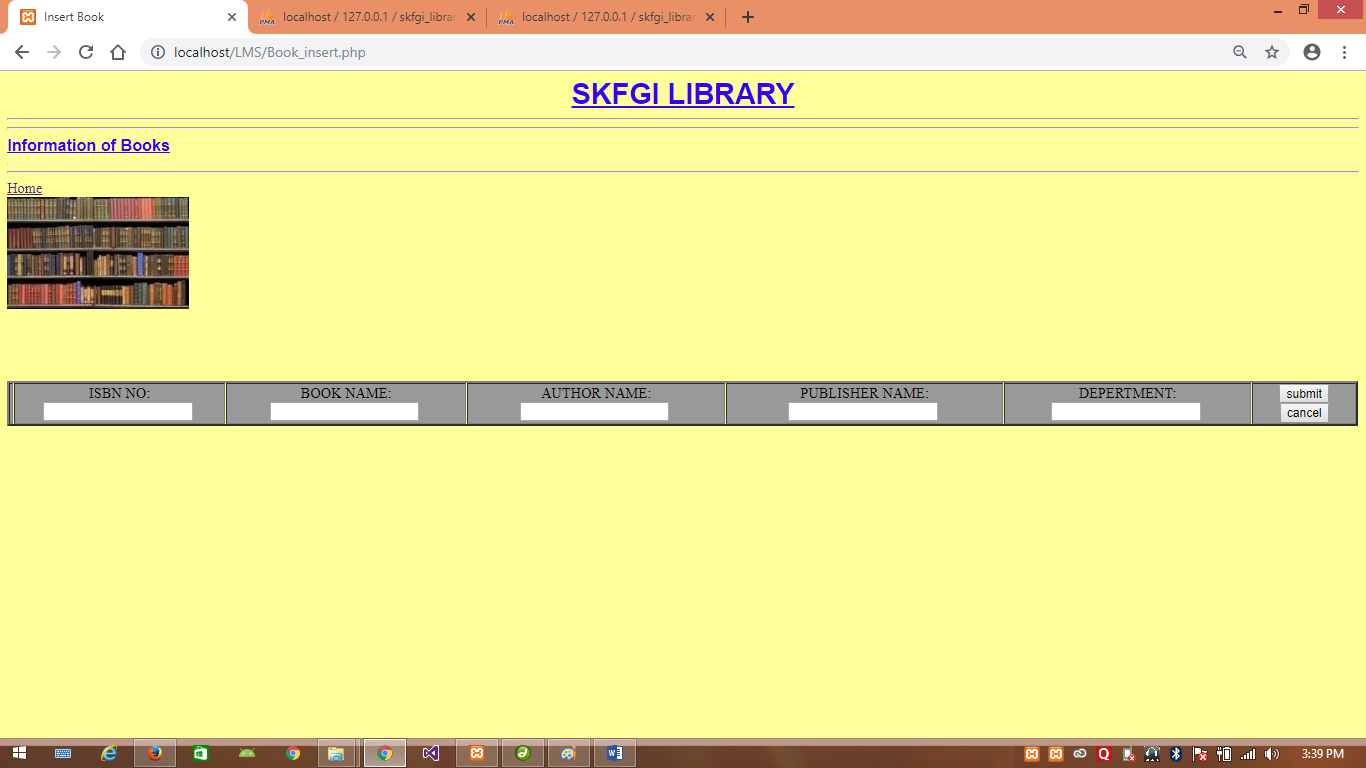




User

Admin

**BOOK INSERT**



if(!empty($\_POST['p1']))

{

include\_once("database\_connection.php");

$ISBN\_NO=$\_POST['n1'];

$BOOK\_NAME=$\_POST['n2'];

$AUTHER=$\_POST['n3'];

$PUBLISHER=$\_POST['n4'];

$DEPERTMENT=$\_POST['n5'];

$I=0;

$sql="insert into library(ISBN\_NO,BOOK\_NAME,AUTHER,PUBLISHER,DEPERTMENT,ISSUED) values($ISBN\_NO,'$BOOK\_NAME','$AUTHER','$PUBLISHER','$DEPERTMENT',$I)";

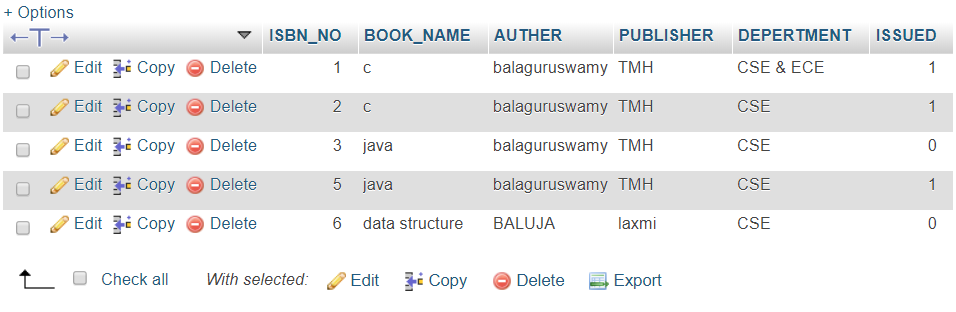
if(!mysqli\_query($con,$sql))

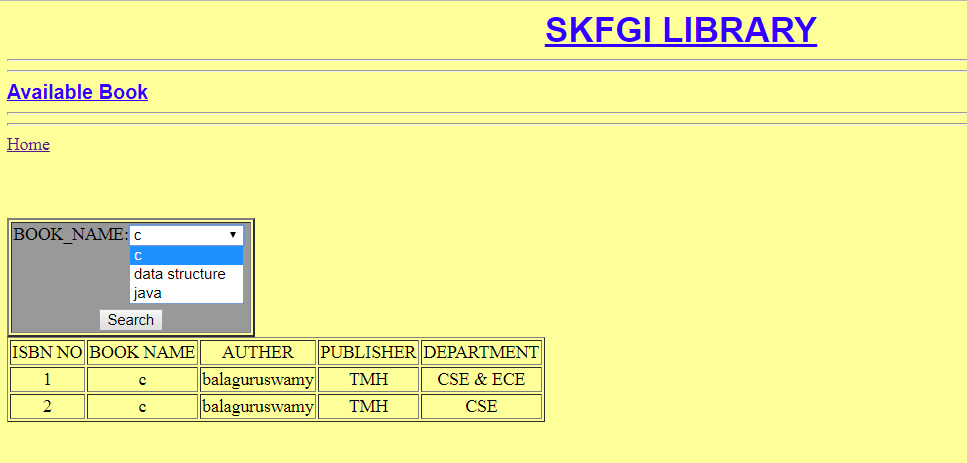
{

die("ISBN Number is Exist");

}

}





<?php

include\_once("database\_connection.php");

$sql=mysqli\_query($con,"select BOOK\_NAME from library order by BOOK\_NAME");

while($row=mysqli\_fetch\_row($sql))

{

echo "<option value='$row[0]'>";

echo $row[0];

echo "</option>";

}

?>

</select>

<br />

<br />

<br />

<br/>

<input type="submit" value="Search" name="a1" />

</form>

</td>

</tr>

</table>

</head>

</body>

</html>

<?php

include\_once("database\_connection.php");

//for searching

if(!empty($\_POST['a1']))

{

$BOOK\_NAME=$\_POST['n2'];

$sql=mysqli\_query($con,"select \* from library where BOOK\_NAME='$BOOK\_NAME'");

echo "<table border=1><tr align=center><td>ISBN NO</td><td> BOOK NAME </td><td>

AUTHER</td><td> PUBLISHER</td><td> DEPARTMENT</td></tr>";

while($row=mysqli\_fetch\_row($sql))

{

echo "<tr align=center>";

echo "<td>".$row[0]."</td>";

echo "<td>".$row[1]."</td>";

echo "<td>".$row[2]."</td>";

echo "<td>".$row[3]."</td>";

echo "<td>".$row[4]."</td>";

echo "</tr>";

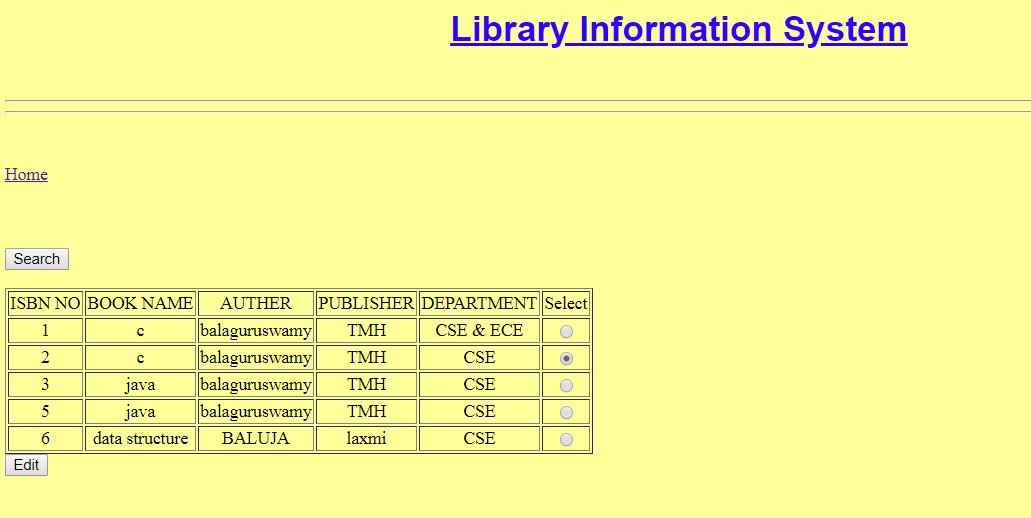
}

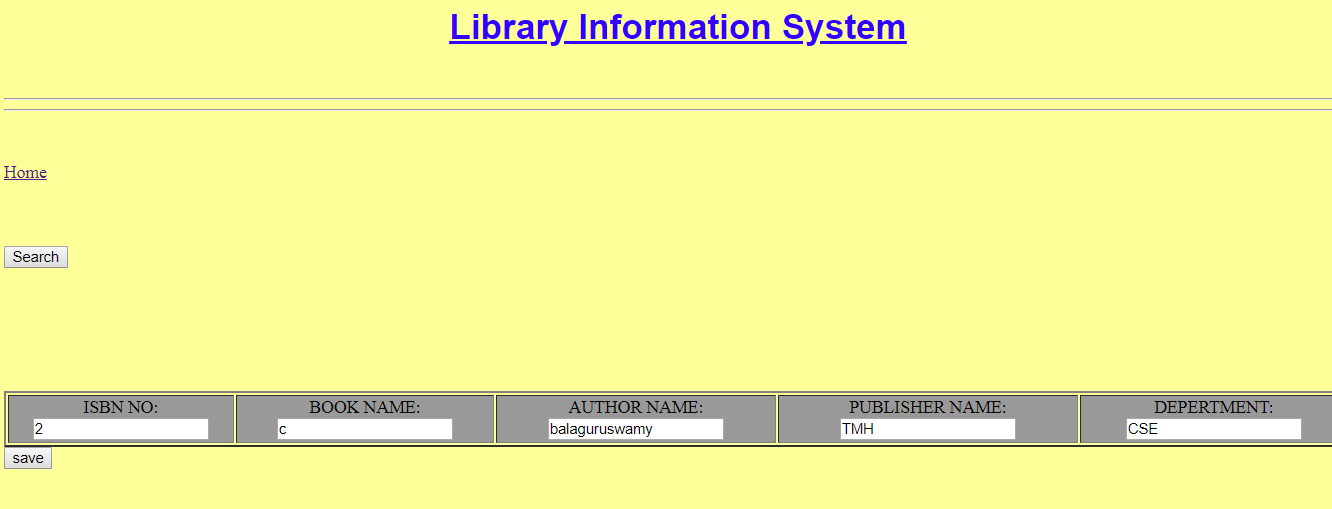
echo "</table>";

}

?>

**BOOK EDIT**





//for searching

if(!empty($\_POST['p1']))

{

$sql=mysqli\_query($con,"select \* from library order by ISBN\_NO ");

echo "<table border=1><tr align=center><td>ISBN NO</td><td> BOOK NAME </td><td>

AUTHER</td><td> PUBLISHER</td><td> DEPARTMENT</td><td> Select</td></tr>";

$r="r1";

while($row=mysqli\_fetch\_row($sql))

{

echo "<tr align=center>";

echo "<td>".$row[0]."</td>";

echo "<td>".$row[1]."</td>";

echo "<td>".$row[2]."</td>";

echo "<td>".$row[3]."</td>";

echo "<td>".$row[4]."</td>";

echo "<td><input type=radio name=".$r." value=".$row[0]."></td>";

echo "</tr>";

}

$p="p2";

echo "</table>"."<input type=submit value=Edit name=".$p."/>";

}

?>

</form>

<form name="f3" method="post" >

<?php

include\_once("database\_connection.php");

//for searching

if(!empty($\_POST['r1']))

{

$n=$\_POST['r1'];

$sql=mysqli\_query($con,"select \* from library where ISBN\_NO='$n' ");

$n1="n1";

$n2="n2";

$n3="n3";

$n4="n4";

$n5="n5";

while($row=mysqli\_fetch\_row($sql))

{

echo "<table border=2><tr align=center bgcolor=#999999>";

echo "<td>ISBN NO:<input type=text name=".$n1." value=".$row[0]." /><br/></td>";

echo "<br />";

echo "<td>BOOK NAME:<input type=text name=".$n2." value=".$row[1]." /><br/></td>";

echo "<br />";

echo "<td>AUTHOR NAME:<input type=text name=".$n3." value=".$row[2]." /><br/></td>";

echo "<br />";

echo "<td>PUBLISHER NAME:<input type=text name=".$n4." value=".$row[3]." /><br/></td>";

echo "<br />";

echo "<td>DEPERTMENT:<input type=Text name=".$n5." value=".$row[4]." /><br/></td>";

echo "<br />";

echo "</tr></table>";

}

$p="p3";

echo "<input type=submit value=save name=".$p." />";

}

?>

</form>

<?php

include\_once("database\_connection.php");

if(!empty($\_POST['p3']))

{

$ISBN\_NO=$\_POST['n1'];

$BOOK\_NAME=$\_POST['n2'];

$AUTHER=$\_POST['n3'];

$PUBLISHER=$\_POST['n4'];

$DEPERTMENT=$\_POST['n5'];

//for insert data in database

$sql="update library set ISBN\_NO=$ISBN\_NO,BOOK\_NAME='$BOOK\_NAME',AUTHER='$AUTHER',PUBLISHER='$PUBLISHER',DEPERTMENT='$DEPERTMENT' where ISBN\_NO=$ISBN\_NO";

if(!mysqli\_query($con,$sql))

{

die("connection failed");

}

else

echo "Updated Successfully";

}

// AND

//AND AND AND

?>

</head>

</body>

</html>

Book Issue





//for searching 3

session\_start();

if(!empty($\_POST['a2']))

{

{

$Student\_Id=$\_POST['n2'];

$sql=mysqli\_query($con,"select \* from user\_details where username='$Student\_Id'");

echo "<table border=1><tr align=center><td> User Name </td><td>Phone Number</td></tr>";

while($row=mysqli\_fetch\_row($sql))

{

echo "<tr align=center>";

echo "<td>".$row[0]."</td>";

echo "<td>".$row[8]."</td>";

echo "</tr>";

$\_SESSION['uid']=$row[3];

$\_SESSION['name']=$row[0];

}

echo "</table>";

}

}

?>

</form>

<form name="f1" method="post">

<table border="2">

<tr align=center bgcolor="#999999">

<td>

BOOK\_NAME:<select name="n2">

<?php

//session\_start();

include\_once("database\_connection.php");

$sql=mysqli\_query($con,"select DISTINCT(BOOK\_NAME) from library order by BOOK\_NAME");

while($row=mysqli\_fetch\_row($sql))

{

echo "<option value='$row[0]'>";

echo $row[0];

echo "</option>";

}

?>

</select>

<br />

<br />

<br />

<br/>

<input type="submit" value="Search" name="a1" />

</form>

</td>

</tr>

</table>

<br />

</body>

</html>

<form name="f2" method="post">

<?php

include\_once("database\_connection.php");

//for searching

if(!empty($\_POST['a1']))

{

echo "HI ".$\_SESSION['name']."</br>";

$BOOK\_NAME=$\_POST['n2'];

$sql=mysqli\_query($con,"select \* from library where BOOK\_NAME='$BOOK\_NAME' AND ISSUED=0");

echo "<table border=1><tr align=center><td>ISBN NO</td><td> BOOK NAME </td><td> AUTHER</td><td> PUBLISHER</td><td> DEPARTMENT</td><td> Select</td></tr>";

$r="r1";

while($row=mysqli\_fetch\_row($sql))

{

echo "<tr align=center>";

echo "<td>".$row[0]."</td>";

echo "<td>".$row[1]."</td>";

echo "<td>".$row[2]."</td>";

echo "<td>".$row[3]."</td>";

echo "<td>".$row[4]."</td>";

echo "<td><input type=radio name=".$r." value=".$row[0]."></td>";

echo "</tr>";

}

echo "</table>";

$a="a";

echo "<input type=submit value=Issues name=".$a." />";

}

?>

</form>

<?php

include\_once("database\_connection.php");

//for searching 4

if(!empty($\_POST['a']))

{

{

$ISBN\_NO=$\_POST['r1'];

$uid=$\_SESSION['uid'];

$sql="insert into issue(ISBN\_NO,Username) values($ISBN\_NO,'$uid')";

$sql1="update library set ISSUED=1 where ISBN\_NO=".$ISBN\_NO ;

if(mysqli\_query($con,$sql) && mysqli\_query($con,$sql1))

echo "Issued Successfully";

else

echo " Not Issued Successfully";

}

}

session\_destroy();

?>

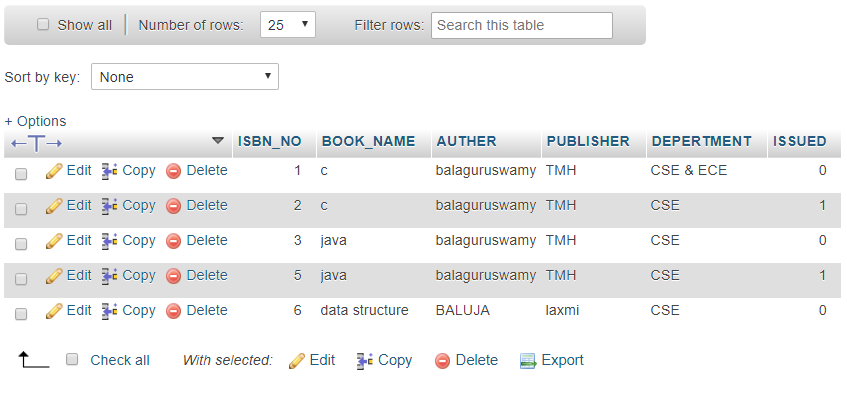
</form>

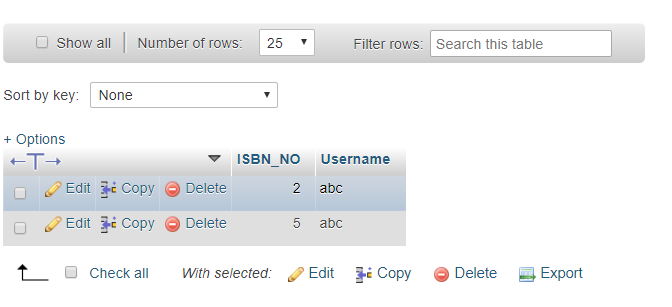
</td>

</tr>

</table>

</form>





Book Return

<?php

include\_once("database\_connection.php");

//for searching

session\_start();

if(!empty($\_POST['s1']))

{

$ISBN=$\_POST['n1'];

$\_SESSION['ISBN']=$ISBN;

$s="select \* from issue where ISBN\_No=".$ISBN;

$sql=mysqli\_query($con,$s);

$row=mysqli\_fetch\_row($sql);

$s1="select \* from library where ISBN\_No=".$ISBN;

$sql1=mysqli\_query($con,$s1);

$row1=mysqli\_fetch\_row($sql1);

$s2="select \* from user\_details where Username='".$row[1]."'";

$sql2=mysqli\_query($con,$s2);

$row2=mysqli\_fetch\_row($sql2);

echo "<table border=1><tr align=center><td>ISBN NO</td><td> BOOK NAME </td><td> AUTHER</td><td> PUBLISHER</td><td> User name</td></tr>";

echo "<tr align=center>";

echo "<td>".$row1[0]."</td>";

echo "<td>".$row1[1]."</td>";

echo "<td>".$row1[2]."</td>";

echo "<td>".$row1[3]."</td>";

echo "<td>".$row2[0]."</td>";

echo "</tr>";

echo "</table>";

echo "<br><br><input type=submit value=confirm name=s2>";

}

?>

</form>

</body>

</html>

<?php

if(!empty($\_POST['s2']))

{

$ISBN=$\_SESSION['ISBN'];

$sql1="update library set ISSUED=0 where ISBN\_NO=".$ISBN ;

$sql="delete from issue where ISBN\_NO=".$ISBN;

if(mysqli\_query($con,$sql1) && mysqli\_query($con,$sql))

echo "Return Successfully";

else

echo " Try again";

}

?>