

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ
«ХАРКІВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ»

METHODICAL GUIDELINES

for the individual work

**«Development of the software application
to work with the database using MySQL and PHP tools»**

for students of specialties
121 «Software engineering»,
122 «Computer science»,
126 «Information systems and technologies»

Затверджено
редакційно-видавничою
радою університету,
протокол № 3 від 26.10.2022 р.

Харків
НТУ «ХПІ»
2022

Методичні вказівки до самостійної роботи за темою «Розробка прикладного програмного забезпечення для роботи з базою даних засобами MySQL та PHP» для студентів спеціальностей 121 «Інженерія програмного забезпечення», 122 «Комп'ютерні науки» та 126 «Інформаційні системи та технології» / уклад. Д.Л. Орловський, А.М. Копп. – Харків : НТУ «ХПІ», 2022. – 37 с. – Англ. мовою.

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INTRODUCTION

MySQL Database Management System (DBMS) is a freely distributed relational database developed and maintained by Oracle. From the very beginning, MySQL was developed by the Swedish company MySQL AB, which was later acquired by Sun Microsystems, which, in turn, was later acquired by Oracle.

MySQL is distributed under both the GNU General Public License (GPL) and its commercial license. Under the terms of the GPL, software that uses MySQL libraries must also be distributed under the GPL license. For cases where developers do not want to open the source code of their software, a commercial license is provided. The advantage of a commercial license is quality service support. Contrary to Oracle's MySQL licensing policy and to ensure free DBMS status, a fork of MySQL was created and called MariaDB. This database supports high compatibility with MySQL, ensuring the exact correspondence of the programming interface, the so-called API (Application Programming Interface), and MySQL commands.

MySQL is a great solution for small, medium, and sometimes even large software systems. MySQL is also part of the WAMP (Windows, Apache, MySQL, PHP/Perl/Python) and LAMP (Linux, Apache, MySQL, PHP/Perl/Python) web application development stacks. This database is included in many ready-made assemblies of servers designed for web applications, such as XAMPP (which is proposed for use in this methodical guidelines), OpenServer, Denwer, and more. Recently, however, it is because of openness support, server builders and hosting providers are increasingly incorporating MariaDB into WAMP and LAMP stacks.

Typically, MySQL is used as a server accessed by local or remote clients. However, the distribution also contains a library that provides the deployment of an internal server for standalone applications. These guidelines discuss the basics of the database application development using the MySQL DBMS and PHP programming language.

1. DEFINE THE BASIC FUNCTIONALITY OF AN APPLICATION

Warning! This guidelines demonstrate development of just a simple part of the whole database application.

The basic functionality of a web application fragment that is designed to work with the “supply” database is presented in the form of a UML use-case diagram (figure 1).

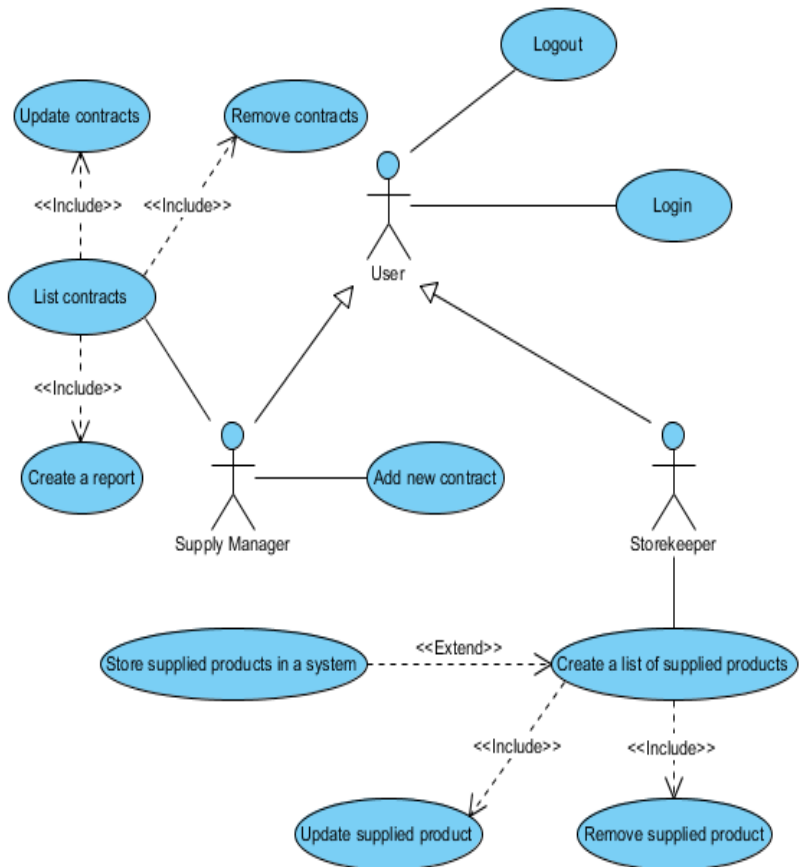


Figure 9.1

2. DEVELOP A PAGE FOR APPLICATION USERS' AUTHORIZATION

All pages of the web application must be placed in the directory “xampp/htdocs/supply”.

Before you begin creating an authorization page, you need to develop the functionality of the software to establish a connection to the database. To do this, create a “connect.php” file with the following content.

```
<?php
function db_conn() {
    $server = "localhost";
    $user = $_SESSION["user"];
    $pass = $_SESSION["pass"];
    $db = "supply";

    $conn = @mysqli_connect($server, $user, $pass, $db);

    if (!$conn) {
        session_unset();
        session_destroy();

        die("Connection failed: " . mysqli_connect_error());
    }

    return $conn;
}
?>
```

In addition, you need to develop a main page of the web application, which is to create an “index.php file” with the following content.

```
1 <?php
2 session_start();
3
4 require_once("connect.php");
5
6 $conn = NULL;
7
8 # check for a user session
9 if (isset($_SESSION["user"])) {
10     $conn = db_conn();
11     include("action.php");
12 } else {
13     # redirected to login page if the user is not set
14     header("location: login.php");
15 }
16 ?>
```

Lines 2-4 contain the start of a user session and connect a file that contains the function “db_conn()” to establish a connection to the database. Lines 9 through 15 include checking for a user session and connecting to

the database. If the user was not authorized, it will be redirected to the authorization page (line 14). Line 11 defines a file connection that includes the processing of forms for adding, updating and deleting data; it will be created later.

```
17 <!DOCTYPE html>
18 <html>
19 <head>
20 <title>Supply</title>
21 </head>
22 <body>
23 <p>
24 <b>User:</b> <i><?=$_SESSION["user"] ?></i> | <a href="logout.php">Logout</a>
25 </p>
26 </?php
27 # display content depending on the user type
28 if ($_SESSION["user"] == "manager") {
29     include("manager.php");
30 }
31
32 if ($_SESSION["user"] == "storekeeper") {
33     include("storekeeper.php");
34 }
35 ?>
36 </body>
37 </html>
38 </?php
39 mysqli_close($conn);
```

The following lines (17 – 39) determine the appearance of the main page: information about the current user (figure 2), the content of the page according to the type of user, disconnecting the database connection (line 39). Line 24 specifies a link that allows you to delete all session variables and finish the session. To do this, use the “logout.php” file.

User: *manager* | [Logout](#)

Figure 2

```
<?php
session_start();

# remove session variables and destroy a session
session_unset();
session_destroy();

header("location: login.php");
```

The user authorization page is stored in the “login.php” file.

```

1 <?php
2 session_start();
3
4 # process login form
5 if (isset($_POST["login"])) {
6     session_unset();
7
8     # set user session variables
9     $_SESSION["user"] = $_POST["user"];
10    $_SESSION["pass"] = $_POST["pass"];
11
12    header("location: index.php");
13 } else {
14     # redirect to a home page if user is already signed in
15     if (isset($_SESSION["user"])) {
16         header("location: index.php");
17     }
18 }
19 ?>

```

Lines 9 and 10 define session record entries that contain user account information. These variables are used in the “connect.php” file to connect to the database using the “mysql_connect()” function. If the user session has already been set, it will be redirected to the “index.php” homepage (lines 15 – 17).

```

20 <!DOCTYPE html>
21 <html>
22 <head>
23 <title>Login</title>
24 </head>
25 <body>
26 <h3>Supply Application Login</h3>
27 <form method="post" action="login.php">
28 <p>
29 <b>User name</b>
30 </p>
31 <p>
32 <input type="text" name="user" required />
33 </p>
34 <p>
35 <b>Password</b>
36 </p>
37 <p>
38 <input type="password" name="pass" required />
39 </p>
40 <p>
41 <input type="submit" name="login" value="Login" />
42 </p>
43 </form>
44 </body>
45 </html>

```

The lines 20 – 45 define the static structure of the user authorization page, which contains the corresponding form with the necessary elements of the user interface (figure 3).

Supply Application Login

User name

Password

Login

Figure 3

The source code of the file “connect.php”:

```
<?php
function db_conn() {
    $server = "localhost";
    $user = $_SESSION["user"];
    $pass = $_SESSION["pass"];
    $db = "supply";

    $conn = @mysql_connect($server, $user, $pass, $db);

    if (!$conn) {
        session_unset();
        session_destroy();

        die("Connection failed: " . mysql_connect_error());
    }

    return $conn;
}
?>
```

The source code of the file “login.php”:

```
<?php
session_start();

# process login form
if (isset($_POST["login"])) {
    session_unset();
```

```

# set user session variables
$_SESSION["user"] = $_POST["user"];
$_SESSION["pass"] = $_POST["pass"];

header("location: index.php");
} else {
# redirect to a home page if user is already signed in
if (isset($_SESSION["user"])) {
header("location: index.php");
}
}
?>
<!DOCTYPE html>
<html>
<head>
<title>Login</title>
</head>
<body>
<h3>Supply Application Login</h3>
<form method="post" action="login.php">
<p>
<b>User name</b>
</p>
<p>
<input type="text" name="user" required />
</p>
<p>
<b>Password</b>
</p>
<p>
<input type="password" name="pass" required />
</p>
<p>
<input type="submit" name="login" value="Login" />
</p>
</form>
</body>
</html>

```

The source code of the file “logout.php”:

```
<?php
session_start();

# remove session variables and destroy a session
session_unset();
session_destroy();

header("location: login.php");
?>
```

The source code of the file “index.php”:

```
<?php
session_start();

require_once("connect.php");

$conn = NULL;

# check for a user session
if (isset($_SESSION["user"])) {
    $conn = db_conn();
    include("action.php");
} else {
    # redirected to login page if the user is not set
    header("location: login.php");
}
?>
<!DOCTYPE html>
<html>
<head>
    <title>Supply</title>
</head>
<body>
    <p>
        <b>User:</b> <i><?= $_SESSION["user"] ?></i> | <a
href="logout.php">Logout</a>
    </p>
<?php
# display content depending on the user type
if ($_SESSION["user"] == "manager") {
```

```
    include("manager.php");
}

if ($_SESSION["user"] == "storekeeper") {
    include("storekeeper.php");
}
?>
</body>
</html>
<?php
mysqli_close($conn);
?>
```

3. DEVELOP SOFTWARE FUNCTIONALITY FOR THE SUPPLY MANAGER

The page containing the software functionality for the supply manager work is contained in the “manager.php” file.

```

1 <?php
2 # check for a user session
3 if (!isset($_SESSION["user"])) {
4     header("Location: login.php");
5 }
6 ?>
7
8 <h3>Contracts</h3>
9 <p>
10 <?php
11 # if the page is in record's create/update or delete mode (action parameter is set) - show 'back' link
12 if (isset($_GET["action"]) && ($_GET["action"] == "create" || $_GET["action"] == "update"
13     || $_GET["action"] == "delete")) {
14     ?>
15     <a href="index.php">Back</a>
16 <?php
17 # otherwise - show 'new record' link
18 ) else {
19     ?>
20     <a href="index.php?action=create">New contract</a>
21 <?php
22 )
23 ?>
24 </p>

```

Lines 1 through 24 contain a check on the availability of a custom session, as well as the mode of working with data on contracts (creation, update or deletion), which depends on the interface element – the “New contract” link, designed to create a new contract (figure 4), or “Back” – for return to viewing data on all contracts (figure 5).

Contracts

[New contract](#)

Contract number	Contract date	Supplier	Note	Action
1	2018-09-01 00:00:00	Petrov Pavlo Petrovych	Order 34 on 30.08.2018	Update Delete
2	2018-09-10 00:00:00	Petrov Pavlo Petrovych	Invoice 08-78 on 28.08.2018	Update Delete
3	2018-09-23 00:00:00	Ivanov Illia Illych	Order 56 on 28.08.2018	Update Delete
4	2018-09-24 00:00:00	Interfruit Ltd.	Order 74 on 11.09.2018	Update Delete
5	2018-10-02 00:00:00	Interfruit Ltd.	Invoice 09-12 on 21.09.2018	Update Delete
7	2018-12-27 13:30:04	Petrov Pavlo Petrovych		Update Delete
13	2019-01-10 13:20:48	Transservice LLC	Order #9876	Update Delete

Figure 4

[Back](#)

Supplier

Petrov Pavlo Petrovych ▼

Note

Save

Figure 5

Lines 26 to 99 include checking the modes of creating a new record (figure 5), updating (figure 6), or deleting an existing record (figure 7) and displaying the corresponding forms with certain elements of the user interface.

```
26 <?php
27 # check for action parameter
28 # show create/update or delete form if it is set
29 if (isset($_GET["action"]) && ($_GET["action"] == "create" || $_GET["action"] == "update"
30 || $_GET["action"] == "delete")) {
31 ?>
32 <form method="post" action="index.php">
33 <input type="hidden" value="<?= $_GET["id"] ?>" name="contract_number" />
34 <?php
35 # if the current mode is create/update
36 # show corresponding form with the required fields and buttons
37 if ($_GET["action"] == "create" || $_GET["action"] == "update") {
38 ?>
39 <p>
40 <b>Supplier</b>
41 </p>
42 <p>
43 <select name="supplier_id">
44 <?php
45 # retrieve suppliers ids/info to display select control
46 $sql = "SELECT * FROM supplier_info";
47 $result = mysqli_query($conn, $sql);
48
49 while ($row = mysqli_fetch_assoc($result)) {
50     ?><option value="<?= $row["supplier_id"] ?>"><?= $row["Info"] ?></option><?php
51     ?>
52     ?>
53 </select>
54 </p>
```


[Back](#)

Delete the contract #13?

Continue

Figure 7

Lines 100 – 133, in its turn, define a table with data about contracts and corresponding links (Action column), intended for manipulation of these data (figure 4).

Lines 135 – 179 contain the definition of an additional table designed to display the list of delivered goods under a specific contract (figure 8). To demonstrate this table, the necessary check of the data view of contracts is performed (lines 137 – 138).

```
100  <?>
101  <table border="1">
102      <tr>
103          <th>Contract number</th>
104          <th>Contract date</th>
105          <th>Supplier</th>
106          <th>Notes</th>
107          <th>Action</th>
108      </tr>
109  <?php
110      # retrieve and display data about contracts
111      $sql = "SELECT contract_supplier.*,
112            (SELECT contract_note FROM contract WHERE contract_number = contract_supplier.contract_number) AS 'note'
113            FROM contract_supplier";
114      $result = mysql_query($conn, $sql);
115
116      while ($row = mysql_fetch_assoc($result)) {
117          <tr>
118              <td><a href="index.php?action=info&id=?" $row["contract_number"] ?"><?=$row["contract_number"] ?></a></td>
119              <td><?=$row["contract_date"] ?></td>
120              <td><?=$row["supplier"] ?></td>
121              <td><?=$row["note"] ?></td>
122              <td>
123                  <a href="index.php?action=update&id=?" $row["contract_number"] ?">Update</a>
124                  <a href="index.php?action=delete&id=?" $row["contract_number"] ?">Delete</a>
125              </td>
126          </tr>
127      <?php
128          }
129  </table>
130  <?>
131  </table>
132  <?php
133  }
```

```

135 # if the action mode is info
136 # display data about supplied products for a selected contract
137 if (isset($_GET["action"]) && $_GET["action"] == "info") {
138     $contract_number = $_GET["id"];
139     ??>
140     <h3>Supplied products by contract #<?=$contract_number ?></h3>
141     <p>
142         <a href="index.php">Hide</a>
143     </p>
144     <?php
145         # retrieve data about selected products
146         $sql = "SELECT supplied_product, supplied_amount, supplied_cost
147             FROM supplied
148             WHERE contract_number = {$contract_number}";
149         $result = mysqli_query($conn, $sql);
150
151         # check the size of a result set
152         if (mysqli_num_rows($result) > 0) {
153             ??>
154             <table border="1">
155                 <tr>
156                     <th>Product</th>
157                     <th>Amount</th>
158                     <th>Cost</th>
159                 </tr>
160             <?php
161
162             # display products if the contract is not empty
163             while ($row = mysqli_fetch_assoc($result)) {
164                 ??>
165                 <tr>
166                     <td><?=$row["supplied_product"] ?></td>
167                     <td><?=$row["supplied_amount"] ?></td>
168                     <td><?=$row["supplied_cost"] ?></td>
169                 </tr>
170             <?php
171             } else {
172                 # if the result set is empty print the following message
173                 echo "Contract is empty";
174             }
175             ??>
176         </table>
177     <?php
178     }
179     ??>

```

Contract number	Contract date	Supplier	Note	Action
1	2018-09-01 00:00:00	Petrov Pavlo Petrovych	Order 34 on 30.08.2018	Update Delete
2	2018-09-10 00:00:00	Petrov Pavlo Petrovych	Invoice 08-78 on 28.08.2018	Update Delete
3	2018-09-23 00:00:00	Ivanov Illia Ilych	Order 56 on 28.08.2018	Update Delete
4	2018-09-24 00:00:00	Interfruit Ltd.	Order 74 on 11.09.2018	Update Delete
5	2018-10-02 00:00:00	Interfruit Ltd.	Invoice 09-12 on 21.09.2018	Update Delete
7	2018-12-27 13:30:04	Petrov Pavlo Petrovych		Update Delete
13	2019-01-10 13:20:48	Transservice LLC	Order #9876	Update Delete

Supplied products by contract #4

[Hide](#)

Product	Amount	Cost
Audio Player	22	320.00
Printer	41	332.50
TV	56	990.00

Figure 8

The source code of the file “manager.php”:

```

<?php
# check for a user session
if (!isset($_SESSION["user"])) {
    header("location: login.php");
}
?>

<h3>Contracts</h3>
<p>
<?php
# if the page is in record's create/update or delete mode (action parameter
is set) - show 'back' link
if (isset($_GET["action"]) && ($_GET["action"] == "create" || $_GET["ac
tion"] == "update"
|| $_GET["action"] == "delete")) {
?>
    <a href="index.php">Back</a>
<?php
# otherwise - show 'new record' link
} else {
?>
    <a href="index.php?action=create">New contract</a>
    <a href="index.php?action=export">Export data</a>
<?php
}
?>

```

</p>

<?php

check for action parameter

show create/update or delete form if it is set

```
if (isset($_GET["action"]) && ($_GET["action"] == "create" || $_GET["action"] == "update"
```

```
|| $_GET["action"] == "delete")) {
```

?>

```
<form method="post" action="index.php">
```

```
<input type="hidden" value="<?=$_GET["id"] ?>"
```

```
name="contract_number" />
```

```
<?php
```

if the current mode is create/update

show corresponding form with the required fields and buttons

```
if ($_GET["action"] == "create" || $_GET["action"] == "update") {
```

?>

```
<p>
```

```
<b>Supplier</b>
```

```
</p>
```

```
<p>
```

```
<select name="supplier_id">
```

```
<?php
```

retrieve suppliers ids/info to display select control

```
$sql = "SELECT * FROM supplier_info";
```

```
$result = mysqli_query($conn, $sql);
```

```
while ($row = mysqli_fetch_assoc($result)) {
```

```
?><option
```

```
value="<?=$row["supplier_id"] ?>"><?=$row["Info"] ?></option><?php
```

```
}
```

```
?>
```

```
</select>
```

```
</p>
```

```
<p>
```

```
<b>Note</b>
```

```
</p>
```

```
<p>
```

```
<?php
```

retrieve and display contract note of the updated contract

```
if (isset($_GET["action"]) && $_GET["action"] == "update") {
```

```
$contract_number = $_GET["id"];
```

```

    $sql = "SELECT contract_note FROM contract WHERE
contract_number = {$contract_number}";
    $result = mysqli_query($conn, $sql);
    $row = mysqli_fetch_assoc($result);
}
?>
<textarea name="contract_note" rows="5"
cols="50"><?= $row["contract_note"] ?></textarea>
</p>
<p>
<?php
# set proper names for create/update buttons
if (isset($_GET["action"]) && $_GET["action"] == "create") {
?>
    <input type="submit" name="create_contract" value="Save" />
<?php
} else if (isset($_GET["action"]) && $_GET["action"] == "update") {
?>
    <input type="submit" name="update_contract" value="Save" />
<?php
}
?>
</p>
<?php
# if the current mode is delete
# display the corresponding question and button
} else if ($_GET["action"] == "delete") {
?>
    <b>Delete the contract #<?= $_GET["id"] ?>?</b>
<p>
    <input type="submit" name="delete_contract" value="Continue" />
</p>
<?php
}
?>
</form>
<?php
} else {
?>
<table border="1">
<tr>
<th>Contract number</th>
<th>Contract date</th>
<th>Supplier</th>

```

```

        <th>Note</th>
        <th>Action</th>
    </tr>
<?php
# retrieve and display data about contracts
$sql = "SELECT contract_supplier.*,
(SELECT contract_note FROM contract WHERE contract_number =
contract_supplier.contract_number) AS `note`
FROM contract_supplier";
$result = mysqli_query($conn, $sql);

while ($row = mysqli_fetch_assoc($result)) {
    ?>
    <tr>
        <td><a
href="index.php?action=info&id=<?=$row["contract_number"] ?>"><?=$
row["contract_number"] ?></a></td>
        <td><?=$row["contract_date"] ?></td>
        <td><?=$row["Supplier"] ?></td>
        <td><?=$row["note"] ?></td>
        <td>
            <a
href="index.php?action=update&id=<?=$row["contract_number"] ?>">Up
date</a>
            <a
href="index.php?action=delete&id=<?=$row["contract_number"] ?>">Del
ete</a>
        </td>
    </tr>
<?php
}
?>
</table>
<?php
}

# if the action mode is info
# display data about supplied products for a selected contract
if (isset($_GET["action"]) && $_GET["action"] == "info") {
    $contract_number = $_GET["id"];
    ?>
    <h3>Supplied products by contract #<?=$contract_number ?></h3>
    <p>
    <a href="index.php">Hide</a>

```

```

</p>
<?php
# retrieve data about selected products
$sql = "SELECT supplied_product, supplied_amount, supplied_cost
FROM supplied
WHERE contract_number = {$contract_number}";
$result = mysqli_query($conn, $sql);

# check the size of a result set
if (mysqli_num_rows($result) > 0) {
    ?>
    <table border="1">
        <tr>
            <th>Product</th>
            <th>Amount</th>
            <th>Cost</th>
        </tr>
    <?php
    # display products if the contract is not empty
    while ($row = mysqli_fetch_assoc($result)) {
        ?>
        <tr>
            <td><?= $row["supplied_product"] ?></td>
            <td><?= $row["supplied_amount"] ?></td>
            <td><?= $row["supplied_cost"] ?></td>
        </tr>
    <?php
    }
} else {
    # if the result set is empty print the following message
    echo "Contract is empty";
}
?>
</table>
<?php
}
?>

```

4. DEVELOP SOFTWARE FUNCTIONALITY FOR THE WAREHOUSE EMPLOYEE

The page containing the software functionality for the storekeeper's work is contained in the "storekeeper.php" file.

Lines 1 through 14 contain a check for the presence of a custom session, as well as the presence of a session variable, an array to which goods that are put into the warehouse but not yet stored in a database are recorded.

```
1 <?php
2 # check for a user session
3 if (!isset($_SESSION["user"])) {
4     header("location: login.php");
5 }
6
7 # initialize array of delivered but not stored products
8 # such array is implemented as the session variable
9 if (!isset($_SESSION["supplied_products"])) {
10     $_SESSION["supplied_products"] = array();
11 }
12 ?>
13
14 <h3>Supplied products</h3>
```

In rows 16 – 72 the table of products supplied to the warehouse is determined.

```
16 <?php
17 # check for awaiting deliveries (is there any empty contracts)
18 $sql = "SELECT * FROM contract_supplier
19 WHERE contract_number NOT IN (SELECT contract_number FROM supplied)";
20 $result = mysqli_query($conn, $sql);
21
22 # if awaiting deliveries exist
23 # display a corresponding form
24 if (mysqli_num_rows($result) > 0) {
25     # check session array of delivered but not stored products
26     # if there are any products - display the form used to store supplied products
27     if (sizeof($_SESSION["supplied_products"]) > 0) {
28         ?>
29         <form method="post" action="index.php">
30             <p>
31                 <b>by contract</b>
32                 <select name="contract_number">
33                     <?php
34                         # display the combo box with awaiting orders
35                         while ($row = mysqli_fetch_assoc($result)) {
36                             ?><option value="<?=$row["contract_number"] ?>">
37                                 <?=$row["contract_number"] . " - " . $row["Supplier"] .
38                                 " (" . $row["contract_date"] . ")" ?></option><?php
39                             }
40                             ?>
41                         </select>
42                     </p>
43                     <table border="1">
44                         <tr>
45                             <th>Product</th>
46                             <th>Amount</th>
47                             <th>Cost</th>
48                             <th>Action</th>
49                         </tr>
```

In this case, checking the presence of products in the array (session variable) and the output of the form (figure 9), which allows you to record the received goods in the database (lines 27 – 67) is performed.

```

50 <?php
51 # display the session array of delivered products
52 foreach ($_SESSION["supplied_products"] as $key => $value) {
53     ?>
54     <tr>
55         <td><?=$key ?></td>
56         <td><?=$value["amount"] ?></td>
57         <td><?=$value["cost"] ?></td>
58         <td><a href="index.php?supplied=remove&product=<?=$key ?>">Remove</a></td>
59     </tr>
60 <?php
61 }
62 ?>
63 </table>
64 <p>
65     <input type="submit" name="save_products" value="Store products" />
66 </p>
67 </form>
68 <?php
69 } else {
70     echo "Add supplied products";
71 }
72 ?>

```

Also, the presence of expected deliveries is checked (if there are so-called “empty” contracts that have been concluded, but for which no goods have been delivered yet) in lines 17 – 24. In the case of such contracts, a form (figure 10) is displayed for adding the supplied product (lines 73 – 103).

```

73 <p>
74     <b>New product</b>
75 </p>
76 <form method="post" action="index.php">
77     <table border="1">
78         <tr>
79             <th>Product</th>
80             <th>Amount</th>
81             <th>Cost</th>
82         </tr>
83         <tr>
84             <td>
85                 <input type="text" name="supplied_product" required />
86             </td>
87             <td>
88                 <input type="number" name="supplied_amount" min="0.01" step="0.01" value="0.01" required />
89             </td>
90             <td>
91                 <input type="number" name="supplied_cost" min="0.01" step="0.01" value="0.01" required />
92             </td>
93         </tr>
94     </table>
95     <p>
96         <input type="submit" name="add_product" value="Add product">
97     </p>
98 </form>
99 <?php
100 } else {
101     echo "There are no awaiting deliveries";
102 }
103 ?>

```

Supplied products

by contract 13 - Transservice LLC (2019-01-10 13:20:48) ▾

Product	Amount	Cost	Action
TV	15	900	Remove
Camera	30	1200	Remove
Watch	200	399.99	Remove

Store products

Figure 9

New product

Product	Amount	Cost
Bluetooth Speaker	99	120

Add product

Figure 10

The source code of the file “storekeeper.php”:

```
<?php
# check for a user session
if (!isset($_SESSION["user"])) {
    header("location: login.php");
}

# initialize array of delivered but not stored products
# such array is implemented as the session variable
if (!isset($_SESSION["supplied_products"])) {
    $_SESSION["supplied_products"] = array();
}
?>

<h3>Supplied products</h3>
<?php
# check for awaiting deliveries (is there any empty contracts)
$sql = "SELECT * FROM contract_supplier
WHERE contract_number NOT IN (SELECT contract_number FROM
supplied)";
$result = mysqli_query($conn, $sql);
```

```

# if awaiting deliveries exist
# display a corresponding form
if (mysqli_num_rows($result) > 0) {
    # check session array of delivered but not stored products
    # if there are any products - display the form used to store supplied
    products
    if (sizeof($_SESSION["supplied_products"]) > 0) {
        ?>
        <form method="post" action="index.php">
            <p>
                <b>by contract</b>
                <select name="contract_number">
                    <?php
                        # display the combo box with awaiting orders
                        while ($row = mysqli_fetch_assoc($result)) {
                            ?><option value="<?=$row["contract_number"] ?>">
                                <?=$row["contract_number"] . " - " . $row["Supplier"] .
                                    " (" . $row["contract_date"] . ")" ?></option><?php
                        }
                    ?>
                </select>
            </p>
            <table border="1">
                <tr>
                    <th>Product</th>
                    <th>Amount</th>
                    <th>Cost</th>
                    <th>Action</th>
                </tr>
                <?php
                    # display the session array of delivered products
                    foreach ($_SESSION["supplied_products"] as $key => $value) {
                        ?>
                        <tr>
                            <td><?=$key ?></td>
                            <td><?=$value["amount"] ?></td>
                            <td><?=$value["cost"] ?></td>
                            <td><a
href="index.php?supplied=remove&product=<?=$key ?>">Remove</a></
td>
                        </tr>
                    <?php
                }
            ?>

```

```

        </table>
        <p>
            <input type="submit" name="save_products" value="Store products"
/>
    </p>
</form>
<?php
} else {
    echo "Add supplied products";
}
?>
<p>
    <b>New product</b>
</p>
<form method="post" action="index.php">
    <table border="1">
        <tr>
            <th>Product</th>
            <th>Amount</th>
            <th>Cost</th>
        </tr>
        <tr>
            <td>
                <input type="text" name="supplied_product" required />
            </td>
            <td>
                <input type="number" name="supplied_amount" min="0.01"
step="0.01" value="0.01" required />
            </td>
            <td>
                <input type="number" name="supplied_cost" min="0.01"
step="0.01" value="0.01" required />
            </td>
        </tr>
    </table>
    <p>
        <input type="submit" name="add_product" value="Add product">
    </p>
</form>
<?php
} else {
    echo "There are no awaiting deliveries";
}
?>

```

5. DEVELOP A FUNCTIONALITY TO GENERATE AN EXCEL REPORT THAT WILL DISPLAY SUPPLIES OVER A GIVEN PERIOD

The implementation of this functionality will also be located in the file “action.php”, which contains the processing of user forms.

Lines 1 through 34 of this file contain forms processing, which are intended to create contract records, as well as update and delete existing records. It should be noted that in order to perform operations for creating, updating and deleting entries from the table contract, the created previously stored procedure “sp_contract_ops” is used.

Lines 36 – 60 process forms that are designed to create a record of the delivered, but not yet stored in the database of the product, as well as the removal of such entries from an array stored as a session user variable.

```
1 <?php
2 # process request to create contract
3 if (isset($_POST["create_contract"])) {
4     $supplier_id = $_POST["supplier_id"];
5     $contract_note = $_POST["contract_note"];
6
7     # use the stored procedure created earlier
8     $sql = "CALL sp_contract_ops('i', 0, '', ($supplier_id), '{$contract_note}')";
9     mysqli_query($conn, $sql);
10
11     header("location: index.php");
12 }
13
14 # process request to delete contract
15 if (isset($_POST["delete_contract"])) {
16     $contract_number = $_POST["contract_number"];
17
18     $sql = "CALL sp_contract_ops('d', ($contract_number), '', 0, '')";
19     mysqli_query($conn, $sql);
20
21     header("location: index.php");
22 }
23
24 # process request to update contract
25 if (isset($_POST["update_contract"])) {
26     $contract_number = $_POST["contract_number"];
27     $supplier_id = $_POST["supplier_id"];
28     $contract_note = $_POST["contract_note"];
29
30     $sql = "CALL sp_contract_ops('u', ($contract_number), CURRENT_TIMESTAMP(), ($supplier_id), '{$contract_note}')";
31     mysqli_query($conn, $sql);
32
33     header("location: index.php");
34 }
35
36 # process request to insert new record into session array of delivered products
37 if (isset($_POST["add_product"])) {
38     $supplied_product = $_POST["supplied_product"];
39     $supplied_amount = $_POST["supplied_amount"];
40     $supplied_cost = $_POST["supplied_cost"];
41
42     if (!empty($supplied_product) && !empty($supplied_amount) && !empty($supplied_cost)) {
43         if (is_numeric($supplied_amount) && is_numeric($supplied_cost)) {
44             if ($supplied_amount > 0 && $supplied_cost > 0) {
45                 $_SESSION["supplied_products"][$supplied_product] = array("amount" => $supplied_amount,
46                                     "cost" => $supplied_cost);
47             }
48         }
49     }
50
51     header("location: index.php");
52 }
53
54 # process request to remove a record from the session array
55 if (isset($_GET["supplied"]) && $_GET["supplied"] == "remove") {
56     $supplied_product = $_GET["product"];
57     unset($_SESSION["supplied_products"][$supplied_product]);
58
59     header("location: index.php");
60 }
```

Lines 62 – 103 demonstrate the preservation of delivered goods to the database. It should be noted that the creation of records about goods delivered under a specific contract in the table “supplied” is carried out inside the transaction, because the partial (due to any circumstances) transfer of data received from the session variable to the operational database is not acceptable.

```

62 # process request to store delivered products into the database
63 if (isset($_POST["save_products"])) {
64     $contract_number = $_POST["contract_number"];
65
66     # begin transaction
67     mysqli_query($conn, "SET AUTOCOMMIT = 0");
68     mysqli_query($conn, "START TRANSACTION");
69
70     $failed = false;
71
72     foreach ($_SESSION["supplied_products"] as $key => $value) {
73         $amount = $value["amount"];
74         $cost = $value["cost"];
75
76         # keep result of each query inside the transaction
77         $result = mysqli_query($conn, "INSERT INTO supplied (contract_number,
78             supplied_product, supplied_amount, supplied_cost) VALUES (
79             {$contract_number}, '{$key}', {$amount}, {$cost})");
80
81         if (!$result) {
82             $failed = true;
83
84             # rollback the transaction if any query is failed
85             mysqli_query($conn, "ROLLBACK");
86             break;
87         }
88     }
89
90     if (!$failed) {
91         # commit the transaction if there are no failed queries
92         mysqli_query($conn, "COMMIT");
93     }
94
95     # restore autocommit property
96     mysqli_query($conn, "SET AUTOCOMMIT = 1");
97
98     # clear session array after products are stored into the database
99     $_SESSION["supplied_products"] = NULL;
100
101     header("location: index.php");
102 }
103 ->

```

The code of the file “action.php” should be supplemented with the following fragment, which is intended to create and save an Excel document with a report on volumes of supplied products for a certain period. To create a report, the previously saved stored procedure “sp_contract_total” will be used.

The contents of the “manager.php” file must be supplemented with a link (figure 11), which will allow to generate and download the report (line 21).

```

8 <h3>Contracts</h3>
9 <p>
10 <?php
11 # if the page is in record's create/update or delete mode (action parameter is set) - show 'back' link
12 if (isset($_GET["action"]) && $_GET["action"] == "create" || $_GET["action"] == "update"
13     || $_GET["action"] == "delete") {
14     ?>
15     <a href="index.php">Back</a>
16 <?php
17 # otherwise - show 'new record' link
18 } else {
19     ?>
20     <a href="index.php?action=create">New contract</a>
21     <a href="index.php?action=export">Export data</a>
22 <?php
23     ?>
24 }
25 </p>

```

In addition, the action.php file must be supplemented by a code (lines 104 – 127), designed directly to generate and download the report (figure 12).

```

104 # process request to export report into the Excel document
105 if (isset($_GET["action"]) && $_GET["action"] == "export") {
106     $filename = "report_contracts_" . date('Ymd') . ".xls";
107
108     header("Content-Disposition: attachment; filename=\"$filename\"");
109     header("Content-Type: application/vnd.ms-excel");
110
111     $flag = false;
112     $result = mysqli_query($conn, "CALL sp_contract_total('2018-01-01', CURRENT_TIMESTAMP())");
113
114     while ($row = mysqli_fetch_assoc($result)) {
115         if (!$flag) {
116             echo implode("\t", array_keys($row)) . "\r\n";
117             $flag = true;
118         }
119
120         array_walk($row, __NAMESPACE__ . '\cleanData');
121         echo implode("\t", array_values($row)) . "\r\n";
122     }
123
124     exit;
125 }
126
127 function cleanData(&$str) {
128     $str = preg_replace("/\t/", "\\t", $str);
129     $str = preg_replace("/\r?\\n/", "\\n", $str);
130
131     if (strpos($str, "'") {
132         $str = "'" . str_replace("'", "''", $str) . "'";
133     }
134 }
135 ?>

```



Figure 11

	A	B	C	D
1	contract_number	contract_date	SUM(supplied.supplied_amount)	SUM(supplied.supplied_amount * supplied.supplied_cost)
2	1	9/1/2018 0:00	47	39500
3	2	9/10/2018 0:00	24	11350
4	3	9/23/2018 0:00	148	99600
5	4	9/24/2018 0:00	119	76112.5
6	5	10/2/2018 0:00	64	45630
7	7	12/27/2018 13:30	15	59985
8	13	1/10/2019 13:20		

Figure 12

The source code of the file “action.php”:

```

<?php
# process request to create contract
if (isset($_POST["create_contract"])) {
    $supplier_id = $_POST["supplier_id"];
    $contract_note = $_POST["contract_note"];

    # use the stored procedure created earlier
    $sql = "CALL sp_contract_ops('i', 0, ", {$supplier_id},
'{$contract_note}')";
    mysqli_query($conn, $sql);

    header("location: index.php");
}

# process request to delete contract
if (isset($_POST["delete_contract"])) {
    $contract_number = $_POST["contract_number"];

    $sql = "CALL sp_contract_ops('d', {$contract_number}, ", 0, ")";
    mysqli_query($conn, $sql);

    header("location: index.php");
}

# process request to update contract
if (isset($_POST["update_contract"])) {
    $contract_number = $_POST["contract_number"];
    $supplier_id = $_POST["supplier_id"];
    $contract_note = $_POST["contract_note"];

    $sql = "CALL sp_contract_ops('u', {$contract_number},
CURRENT_TIMESTAMP(), {$supplier_id}, '{$contract_note}')";
    mysqli_query($conn, $sql);
}

```

```

    header("location: index.php");
}

# process request to insert new record into session array of delivered
products
if (isset($_POST["add_product"])) {
    $supplied_product = $_POST["supplied_product"];
    $supplied_amount = $_POST["supplied_amount"];
    $supplied_cost = $_POST["supplied_cost"];

    if (!empty($supplied_product) && !empty($supplied_amount) && !empty
($supplied_cost)) {
        if (is_numeric($supplied_amount) && is_numeric($supplied_cost)) {
            if ($supplied_amount > 0 && $supplied_cost > 0) {

                $_SESSION["supplied_products"][$supplied_product] = array("amount" =
> $supplied_amount,
                    "cost" => $supplied_cost);
            }
        }
    }

    header("location: index.php");
}

# process request to remove a record from the session array
if (isset($_GET["supplied"]) && $_GET["supplied"] == "remove") {
    $supplied_product = $_GET["product"];
    unset($_SESSION["supplied_products"][$supplied_product]);

    header("location: index.php");
}

# process request to store delivered products into the database
if (isset($_POST["save_products"])) {
    $contract_number = $_POST["contract_number"];

    # begin transaction
    mysqli_query($conn, "SET AUTOCOMMIT = 0");
    mysqli_query($conn, "START TRANSACTION");

    $failed = false;
}

```

```

foreach ($_SESSION["supplied_products"] as $key => $value) {
    $amount = $value["amount"];
    $cost = $value["cost"];

    # keep result of each query inside the transaction
    $result = mysqli_query($conn, "INSERT INTO supplied
(contract_number,
    supplied_product, supplied_amount, supplied_cost) VALUES (
    {$contract_number}, '{$key}', {$amount}, {$cost})");

    if (!$result) {
        $failed = true;

        # rollback the transaction if any query is failed
        mysqli_query($conn, "ROLLBACK");
        break;
    }
}

if (!$failed) {
    # commit the transaction if there are no failed queries
    mysqli_query($conn, "COMMIT");
}

# restore autocommit property
mysqli_query($conn, "SET AUTOCOMMIT = 1");

# clear session array after products are stored into the database
$_SESSION["supplied_products"] = NULL;

header("location: index.php");
}

# process request to export report into the Excel document
if (isset($_GET["action"]) && $_GET["action"] == "export") {
    $filename = "report_contracts_" . date('Ymd') . ".xls";

    header("Content-Disposition: attachment; filename=\"{$filename}\"");
    header("Content-Type: application/vnd.ms-excel");

    $flag = false;
    $result = mysqli_query($conn, "CALL sp_contract_total('2018-01-01',
CURRENT_TIMESTAMP());");

```

```

while ($row = mysqli_fetch_assoc($result)) {
    if (!$flag) {
        echo implode("t", array_keys($row)) . "\r\n";
        $flag = true;
    }

    array_walk($row, __NAMESPACE__ . '\cleanData');
    echo implode("t", array_values($row)) . "\r\n";
}

exit;
}

function cleanData(&$str) {
    $str = preg_replace("/^t/", "\\t", $str);
    $str = preg_replace("/^r?\n/", "\\n", $str);

    if (strstr($str, "")) {
        $str = "" . str_replace("", "", $str) . "";
    }
}
?>

```

6. TASKS FOR THE INDIVIDUAL WORK

1. Develop software functionality for the “supply” database administrator. The administrator should be able to create, modify, and remove records in all database tables.

2. Add functionality used to sort rows in the “contracts” table (“manager.php” file) in both ascending and descending order:

- by the contract number;
- by the contract date.

3. Add functionality used to sort rows in the “Supplied products by contract #X” table (“manager.php” file) in both ascending and descending order:

- by supplied product name;
- by supplied product amount;
- by supplied product cost.

4. The form used to update data about a certain contract includes the combo box with the list of suppliers. Modify the application in order to after the form is loaded, the supplied assigned to a current contract will be selected in this combo box.

5. It is impossible to remove the contract with the assigned supplied products due to the used referential integrity mode. Modify the software (e.g., by modifying the stored procedure “sp_contract_ops”) in order to allow deleting data about contracts even if there are products supplied by a contract you are trying to remove.

6. It is impossible to remove the contract with the assigned supplied products due to the used referential integrity mode. Modify the software (e.g., by modifying the stored procedure “sp_contract_ops”) in order to deny deletion of data about “not empty” contracts.

7. As it is shown in figure 9.12, the column titles in the generated report are not user-friendly; especially the columns that contain aggregated data. Modify the application in order to assign the “Contract”, “Date”, “Total amount”, and “Total cost” titles for corresponding columns.

8. Current implementation allows to generate report (figure 9.12) based on the fixed range of dates – starting from the “01/01/2018” to the time of report generation. Modify the application in order to user would be able to set the required range of dates.

9. Provide the supply manager with the ability to work with data about suppliers (add records, update and delete existing records). Ensure

that it is possible to check the list of contracts concluded with a certain supplier.

10. Add functionality of automatic generation of the invoice document just after the list of products supplied according to a certain contract is saved into the operational database by the storekeeper.

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Навчальне видання

Методичні вказівки

до самостійної роботи за темою
«Розробка прикладного програмного забезпечення
для роботи з базою даних засобами MySQL та PHP»

для студентів спеціальностей
121 «Інженерія програмного забезпечення»,
122 «Комп'ютерні науки»,
126 «Інформаційні системи та технології»

Англійською мовою

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Роботу до видання рекомендував проф. Гамаюн І.П.

План 2022 р., поз. 275

Підп. до друку 26.10.2022.
Гарнітура Times New Roman.
Ум. друк. арк. 0,5.

Видавничий центр НТУ «ХП».
Свідоцтво про державну реєстрацію ДК № 5478 від 21.08.2017 р.
61002, Харків, вул. Кирпичова, 2

Самостійне електронне видання