

Software Tools 3
Assignment 3
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Question 1: Write a PHP Program to check if a given year is leap year or not.

Answer 1:

```
<?php
    if(!isset($_GET["year"])){
        echo "Please enter a year!";
        return;
    }
    $year = (int)$_GET["year"];
    if(($year%4==0 && $year%100!=0) || ($year%400)==0){
        echo $year." is a leap year!";
        return;
    }
    echo $year." is not a leap year!";
?>
```

← → ↻ 🏠 ⓘ localhost:3000/Assignment_3/1.php?year=2012

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2012 is a leap year!

Question 2: Write a PHP Program to demonstrate use of Indexed arrays.

Answer 2:

```
<?php
    $idx_array = array("This","is","an","indexed","array");
    echo "The indexed array is represented as follows:-<br>";
    echo var_dump($idx_array)."<br>";
    echo "Elements of the Index array can be accessed by index values such as 0,1,2,3<br>";
    echo "Example: idx_array[0] :- ".$idx_array[0]."<br>";
```

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The indexed array is represented as follows:-

array(5) { [0]=> string(4) "This" [1]=> string(2) "is" [2]=> string(2) "an" [3]=> string(7) "indexed" [4]=> string(5) "array" }

Elements of the Index array can be accessed by index values such as 0,1,2,3

Example: idx_array[0] :- This

Question 3: Write a PHP program to compute the sum of the digits of a number using function.

Answer:

```
1  <?php
2
3      function getDigitSum($num){
4          $n = (int)$num;
5          $ans = 0;
6          while($n>0){
7              $ans = $ans + $n%10;
8              $n = $n/10;
9          }
10         return $ans;
11     }
12
13     if(!isset($_GET["num"])){
14         echo "Please enter a valid number!";
15         return;
16     }
17     $num = $_GET["num"];
18     $sum = getDigitSum($num);
19     echo "Sum of digits of ".$num." :- ".$sum;
20     return;
21
22  ?>
```

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Sum of digits of 10231 :- 7

Question 4: Write a PHP program to print out the following table

```
<?php
    $cols = 10;
    $rows = 5;
    echo "<table border=1>";
    for($i=1;$i<=$rows;$i++){
        echo "<tr>";
        for($j=1;$j<=$cols;$j++){
            $val = $j*$i;
            echo "<td style=\"margin: 10px,padding: 5px\">".$val."</td>";
        }
        echo "</tr>";
    }
    echo "</table>";
    return;
?>
```

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1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50

Question 5: Write a PHP program to find the factorial of a number using a recursive function.

```
<?php

function factorial($num){
    if($num<=1) return 1;
    return $num * factorial($num-1);
}

if(!isset($_GET["num"])){
    echo "Please enter a valid number!";
    return;
}

$num = (int)$_GET["num"];
if($num<0){
    echo "Invalid number!";
    return;
}

$ans = factorial($num);
echo "Factorial of ".$num." :- ".$ans;
return;

?>
```

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Factorial of 5 :- 120

Question 6: You need to write a PHP program to calculate electricity bills using if-else conditions.

```
?php

if(!isset($_GET["num"])){
    echo "Please enter a valid number!";
    return;
}
$num = (int)$_GET["num"];
if($num<0){
    echo "Invalid number!";
    return;
}
$val = $num;
$ans = min($num,50)*3.50;
$num -= min($num,50);
$ans += min($num,100)*4.00;
$num -= min($num,100);
$ans += min($num,100)*5.20;
$num -= min($num,100);
$ans += $num*6.50;
echo "Electricity bill for ".$val." Units :- Rs ".$ans."<br>";
return;
```





Electricity bill for 1000 Units :- Rs 5970

Question 7: Write a simple calculator program in PHP using a switch case.

```
?php
if(!isset($_GET["num1"]) || !isset($_GET["num2"]) || !isset($_GET["op"])){
    echo "Please enter a valid number!";
    return;
}
$num1 = (int)$_GET["num1"];
$num2 = (int)$_GET["num2"];
$op = $_GET["op"];
switch($op){
    case "add":
        echo $num1 . " + " . $num2 . " = " . ($num1+$num2);
        break;
    case "sub":
        echo $num1 . " - " . $num2 . " = " . ($num1-$num2);
        break;
    case "mul":
        echo $num1 . " X " . $num2 . " = " . ($num1*$num2);
        break;
    case "div":
        if($num2==0){
            echo "Division by 0 is not possible!<br>";
            return;
        }
        echo $num1 . " / " . $num2 . " = " . ($num1/$num2);
        break;
    default:
        echo "Please enter a valid operation from the below list!<br>";
        echo "Addition : \"add\"<br>";
        echo "Subtraction: \"sub\"<br>";
        echo "Multiplication: \"mul\"<br>";
        echo "Division: \"div\"<br>";
}
return;
```

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10 / 10 = 1

Question 8: Write a PHP Program to perform following Operations of a Matrix

- a) Transpose of matrix
- b) Multiplication of two matrix
- c) Addition of two matrix

Answer:

```
1  <?php
2  function printMat($mat){
3      foreach($mat as $row){
4          foreach($row as $val){
5              echo " ".$val." ";
6          }
7          echo "<br>";
8      }
9  }
10 function transpose($mat){
11     $i = sizeof($mat);
12     if($i==0) return $mat1;
13     $j = sizeof($mat[0]);
14     $ans = array();
15     for($r = 0;$r<$i;$r++){
16         for($c=0;$c<$j;$c++){
17             $ans[$c][$r] = $mat[$r][$c];
18             $ans[$r][$c] = $mat[$c][$r];
19         }
20     }
21     return $ans;
22 }
23
24 function addMat($mat1,$mat2){
25     $r1 = sizeof($mat1);
26     $r2 = sizeof($mat2);
27     $c1 = sizeof($mat1);
28     $c2 = sizeof($mat2);
29     if($r1!=$r2 || $c1!=$c2){
30         return $mat1;
31     }
32     for($i=0;$i<$r1;$i++){
```



```

32         for($i=0;$i<$r1;$i++)
33             for($j=0;$j<$c1;$j++)
34                 $mat1[$i][$j] += $mat2[$i][$j];
35
36         return $mat1;
37     }
38
39     function mulMat($mat1,$mat2){
40         $r1 = sizeof($mat1);
41         $r2 = sizeof($mat2);
42         $c1 = sizeof($mat1);
43         $c2 = sizeof($mat2);
44         if($c1!=$r2){
45             return $mat1;
46         }
47         $ans = array();
48         for($i=0;$i<$r1;$i++){
49             for($j=0;$j<$c1;$j++){
50                 for($k=0;$k<$c2;$k++){
51                     $ans[$i][$k] += ($mat1[$i][$j]*$mat2[$j][$k]);
52                 }
53             }
54         }
55         return $ans;
56     }
57
58     $mat1 = array(array(1,3,2),array(5,6,3),array(2,1,5));
59     $mat2 = array(array(4,5,2),array(1,7,8),array(5,6,8));
60
61     echo "Matrix 1: <br>";

```

```
57
58     $mat1 = array(array(1,3,2),array(5,6,3),array(2,1,5));
59     $mat2 = array(array(4,5,2),array(1,7,8),array(5,6,8));
60
61     echo "Matrix 1: <br>";
62     printMat($mat1);
63     echo "<br><br>";
64     echo "Matrix 2: <br>";
65     printMat($mat2);
66     echo "<br><br>";
67     $mat3 = transpose($mat1);
68     echo "Transpose of Matrix 1: <br>";
69     printMat($mat3);
70     echo "<br><br>";
71     $mat4 = addMat($mat1,$mat2);
72     echo "Addition of Matrix 1 and Matrix 2: <br>";
73     printMat($mat4);
74     echo "<br><br>";
75     $mat5 = mulMat($mat1,$mat2);
76     echo "Multiplication of Matrix 1 and Matrix 2: <br>";
77     printMat($mat5);
78     echo "<br><br>";
79
80
81     ?>
```

Matrix 1:

1 3 2

5 6 3

2 1 5

Matrix 2:

4 5 2

1 7 8

5 6 8

Transpose of Matrix 1:

1 5 2

3 6 1

2 3 5

Addition of Matrix 1 and Matrix 2:

5 8 4

6 13 11

7 7 13

Multiplication of Matrix 1 and Matrix 2:

17 38 42

41 85 82

34 47 52

Question 9: Write a PHP Program to demonstrate

- Functions with Default Argument Value
- Passing Arguments by Reference

Answer:

```
1  <?php
2      function defaultArgs($i,$j=0){
3          echo "Value of i is $i.<br>";
4          echo "Value of j is $j.<br><br>";
5      }
6      function passByRef(&$j){
7          echo "Value of j in function is $j.<br>";
8          $j++;
9          echo "Value of j in function after increment is $j.<br><br>";
10     }
11     defaultArgs(2);
12     defaultArgs(2,3);
13     $j = 0;
14     echo "Value of j outside function is $j.<br><br>";
15     passByRef($j);
16     echo "Value of j outside function after calling it is $j.<br><br>";
17  ?>
```

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Value of i is 2.

Value of j is 0.

Value of i is 2.

Value of j is 3.

Value of j outside function is 0.

Value of j in function is 0.

Value of j in function after increment is 1.

Value of j outside function after calling it is 1.

Question 10: Write a PHP Program to demonstrate

● String Functions

● Math Functions

● Date and Time Functions

```
<?php
$str = "This is a sample string!";
echo "Sample String:- $str <br><br>";
$stringarr = explode(" ", $str);
echo "This is how explode function works:-<br>";
echo var_dump($stringarr). "<br><br>";
$newString = implode(" ", $stringarr);
echo "Reconstructed the string from array:-<br>";
echo "$newString<br><br>";
$hash = md5($str);
echo "MD5 Hash of String:-<br>$hash<br><br>";
$sha = sha1($str);
echo "SHA1 of String:-<br>$sha<br><br>";
$cnt = str_word_count($str);
echo "No. of words in the string:-<br>$cnt<br><br>";
echo "Whether Reconstructed and Sample String are equal(True if 0):- "
.strcmp($str, $newString). "<br><br>";
echo "Position of 'a' in Sample string(Returns index):- ".strpos($str, "a"). "<br><br><hr>";
```

Sample String:- This is a sample string!

This is how explode function works:-

array(5) { [0]=> string(4) "This" [1]=> string(2) "is" [2]=> string(1) "a" [3]=> string(6) "sample" [4]=> string(7) "string!" }

Reconstructed the string from array:-

This is a sample string!

MD5 Hash of String:-

62e1168c55d8f9af78413a6fd8528df9

SHA1 of String:-

c8f2366360bd8a318ab434530dff0697df97240f

No. of words in the string:-

5

Whether Reconstructed and Sample String are equal(True if 0):- 0

Position of 'a' in Sample string(Returns index):- 8

```

1  <?php
2
3      $num = 25;
4      echo "Sample Number :- $num<br><br>";
5      echo "Natural Log of $num :- ".log($num)."<br><br>";
6      echo "Cosine of $num :- ".cos($num)."<br><br>";
7      echo "Value of $num<sup>4</sup> :- ".pow($num,4)."<br><br>";
8      echo "Round of 25.645223 :- ".round(25.645223)."<br><br>";
9      echo "Squire root of $num :- ".sqrt($num)."<br><br>";
10
11  ?>

```

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Sample Number :- 25

Natural Log of 25 :- 3.2188758248682

Cosine of 25 :- 0.99120281186347

Value of 25⁴ :- 390625

Round of 25.645223 :- 26

Squire root of 25 :- 5

```

1  <?php
2
3      echo "Checking whether 12-31-2020 is a date or not(True if 1) :- "
4      .checkdate(12,31,2020)."<br><br>";
5
6      $date=date_create("2020-08-27");
7      date_add($date,date_interval_create_from_date_string("10 days"));
8      echo "Date after adding 10 days to 2020-08-27 :- ".date_format($date,"Y-m-d")."<br><br>";
9
10     $date1=date_create("2019-05-01");
11     $date2=date_create("1540-12-12");
12     $diff=date_diff($date1,$date2);
13     echo "Difference in days between 2019-05-01 and 1540-12-12 :- "
14     ."$diff->format('%R%a days')."<br><br>";
15
16     echo "Local Time of the day :- ".gettimeofday(true)."<br><br>";
17     echo "Local Date :- ";
18     print_r(getdate());
19     echo "<br><br>";
20  ?>

```

Checking whether 12-31-2020 is a date or not(True if 1) :- 1

Date after adding 10 days to 2020-08-27 :- 2020-09-06

Difference in days between 2019-05-01 and 1540-12-12 :- -174726 days

Local Time of the day :- 1598531129.0434

Local Date :- Array ([seconds] => 29 [minutes] => 55 [hours] => 17 [mday] => 27 [wday] => 4 [mon] => 8 [year] => 2020 [yday] => 239 [weekday] => Thursday [month] => August [0] => 1598531129)