<table>
<tr><th colspan="4">Functions and Arrays</th></tr>
<tr><td>S no</td><td>Assignment</td><td colspan="2">Test cases</td></tr>
<tr><td></td><td></td><td>Input</td><td>Output</td></tr>
<tr><td rowspan="4">1</td><td rowspan="4">Write a C program to calculate power a given number using pow(a,b) function in math.h with evaluates: a^b
Use <code>#include<math.h></code> in your c program.
Use below command to compile
<code>$ gcc prog.c -o prog -lm</code></td><td>pow(3,3)</td><td>27</td></tr>
<tr><td><code>int a=2, b=4;
pow(a,b);</code></td><td>16</td></tr>
<tr><td>pow(3,0.5)</td><td>1.732</td></tr>
<tr><td><code>float x=27,
x=0.333333;
pow(x,y);</code></td><td>2.999997</td></tr>
<tr><td>2</td><td colspan="3">Write a program and implement a function to find if it is leap year or not.
Implement below function
int is_leap_year(int year);
• is_leap_year() returns 1 if leap year
• is_leap_year() returns 0 if NOT leap year
Take 4 digit year as input for example: 2000</td></tr>
<tr><td rowspan="4">3</td><td rowspan="4">Write a program and implement a factorial function using below prototype declarations:
long int factorial(long int);</td><td>factorial(4);</td><td>24</td></tr>
<tr><td>int a=5;
factorial(a);</td><td>120</td></tr>
<tr><td>long int b=7;
factorial(b);</td><td>5040</td></tr>
<tr><td>factorial(0)</td><td>1</td></tr>
<tr><td rowspan="4">4</td><td rowspan="4">Implement average function of two numbers as below:
double average(double, double);</td><td>average(2.1,3.4);</td><td>3.30</td></tr>
<tr><td>average(2,4);</td><td>3.00</td></tr>
<tr><td>float a=2, b=8.4;
average(a,b);</td><td>5.2</td></tr>
<tr><td>int x=2, y=8;
average(x,y);</td><td>5.0</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Write a program to use exp function from math.h</td><td>exp(1);</td><td>2.718282</td></tr>
<tr><td>exp(1.0);</td><td>2.718282</td></tr>
<tr><td>exp(2.2);</td><td>9.025013</td></tr>
<tr><td>int b=5;
exp(b);</td><td>148.413159</td></tr>
<tr><td>6</td><td>Write a program to print all the locations at which a particular element (taken as input) is found in a array and also print the total number of times it occurs in</td><td><code>7
30
50
90
30
70
30
30
30</code></td><td><code>30 is present at location 1.
30 is present at location 4.
30 is present at location 6.
30 is present at location 7.
30 is present 4 times in the array.</code></td></tr>
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	the array. The location starts from 1. For example if there are 4 elements in the array 5 6 5 7 If the element to search is 5 then the output will be 5 is present at location 1 5 is present at location 3		
		4 50 60 20 10 80	80 is not present in the array.
		4 5 6 5 7 5	5 is present at location 1. 5 is present at location 3. 5 is present 2 times in the array.
		5 67 80 45 97 100 50	50 is not present in the array.
7	Write a C program to search a given element from a 1D array and display the position at which it is found by using linear search function. The index location starts from 1.	4 45 65 85 25 95	95 is not present in the array.
		5 6 9 5 4 7 6	6 is present at location 1.
		5 78 90 34 54 98 90	90 is present at location 2.
		6 30 40 50 20 90 60 90	90 is present at location 5.

8	Write a C program to reverse an array by using another new array	7 8 9 10 6 4 7 11	Reversed array elements are: 11 7 4 6 10 9 8
		4 10 20 30 40	Reversed array elements are: 40 30 20 10
		5 50 60 40 30 20	Reversed array elements are: 20 30 40 60 50
9	Write a C program to reverse an array by swapping the elements and without using any new array	Same as for above Q.8	Same as for above Q.8