# Lab: Control Flow Logic

Problems for in-class lab for the [“JavaScript Fundamentals” course @ SoftUni](https://softuni.bg/courses/javascript-fundamentals). Submit your solutions in the SoftUni judge system at <https://judge.softuni.bg/Contests/288/>.

## Multiply Numbers

Write a JS function that calculates the product of two numbers.

The **input** comes as two number arguments.

The **output** should be the returned as a result of your function.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| 3  2 | 6 |  | 23632.36  -12.3249 | -291266.473764 |

## Boxes and Bottles

Write a JS function to calculate how many boxes will be needed to fit **n** bottles if each box fits **k** bottles.

The **input** comes as two number arguments. The first element is the number of bottles and the second is the capacity of a single box.

The **output** should be printed to the console.

### Examples

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 20  5 | 4 |  | 15  7 | 3 | 5  10 | 1 |

## Leap Year

Write a JS function to check whether a year is leap. Leap years are either divisible by 4 but not by 100 or are divisible by 400.

The **input** comes as a single number argument.

The **output** should be printed to the console. Print yes if the year is leap and no otherwise.

### Examples

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 1999 | no |  | 2000 | yes | 1900 | no |

## Circle Area

Write a JS function that calculates circle area by given radius. Print the area as it is calculated and then print it rounded to two decimal places.

The **input** comes as a single number argument.

The **output** should be printed to the console on a new line for each result.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 5 | 78.53981633974483  78.54 |

## Triangle Area

Write a JS function that calculates a triangle’s area by its 3 sides.

The **input** comes as three number arguments, representing one side of a triangle.

The **output** should be printed to the console.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  3.5  4 | 3.4994419198 |

### Hints

Use [Heron’s formula](https://en.wikipedia.org/wiki/Heron's_formula) to obtain the result.

## Cone

Write a JS function to calculate a cone’s volume and surface area by given height and radius at the base.

The **input** comes as two number arguments. The first element is the cone’s **radius** and the second is its **height**.

The **output** should be printed to the console on a new line for every result.

### Examples

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |
| 3  5 | volume = 47.1239  area = 83.2298 |  | 3.3  7.8 | volume = 88.9511  area = 122.016 |

### Hints

You can use this online tool to check your results: <http://www.calculatorsoup.com/calculators/geometry-solids/cone.php>

## Odd / Even

Write a JS function to check if a number is **odd** or **even** or **invalid** (fractions are neither odd nor even).

The **input** comes as a single number argument.

The **output** should be printed to the console. Print odd for odd numbers, even for even number and invalid for numbers that contain decimal fractions.

### Examples

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 5 | odd |  | 8 | even | 1.5 | invalid |

## Fruit or Vegetable

Write a JS function to print "**fruit**", "**vegetable**" or "**unknown**" depending on the input string.

* Fruits are: banana, apple, kiwi, cherry, lemon, grapes, peach
* Vegetable are: tomato, cucumber, pepper, onion, garlic, parsley
* All others are unknown

The **input** comes as a single string argument, the name of the fruit.

The **output** should be printed to the console.

### Examples

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| banana | fruit |  | cucumber | vegetable | pizza | unknown |

## Colorful Numbers

Write a JS function to print the numbers from 1 to **n**. Return a string holding HTML list with the odd lines in blue and even lines in green. See the example for more information.

The **input** comes as a single number argument **n**.

The **output** should be returned as a result of your function in the form of a string.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 10 | <ul>  <li><span style='color:green'>1</span></li>  <li><span style='color:blue'>2</span></li>  <li><span style='color:green'>3</span></li>  <li><span style='color:blue'>4</span></li>  <li><span style='color:green'>5</span></li>  <li><span style='color:blue'>6</span></li>  <li><span style='color:green'>7</span></li>  <li><span style='color:blue'>8</span></li>  <li><span style='color:green'>9</span></li>  <li><span style='color:blue'>10</span></li>  </ul> |

## Chess Board

Write a JS function to print a chessboard of size **n X n**. See the example for more information.

The **input** comes as a single number argument **n**.

The **output** should be returned as a result of your function in the form of a string.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 3 | <div class="chessboard">  <div>  <span class="black"></span>  <span class="white"></span>  <span class="black"></span>  </div>  <div>  <span class="white"></span>  <span class="black"></span>  <span class="white"></span>  </div>  <div>  <span class="black"></span>  <span class="white"></span>  <span class="black"></span>  </div>  </div> |

## Binary Logarithm

Write a JS function that prints the **binary logarithm** (***log2 x***) for each number in the input.

The **input** comes as an array of number elements.

The **output** should be printed to the console, on a new line for each number.

## Prime Number Checker

Write a JS function to check if a number is prime (only wholly divisible by itself and one).

The **input** comes as a single number argument.

The **output** should be the return value of your function. Return true for prime number and false otherwise.

### Examples

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Input** | **Output** |  | **Input** | **Output** |  | **Input** | **Output** |
| 7 | true |  | 8 | false | 81 | false |