Challenge 1:add

Write a function that returns the sum of two numbers.

Example

For `param1 = 1` and `param2 = 2`, the output should be `add(param1, param2) = 3`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] integer param1**

  Guaranteed constraints:
  `-1000 ≤ param1 ≤ 1000`.
- **[input] integer param2**

  Guaranteed constraints:
  `-1000 ≤ param2 ≤ 1000`.
- **[output] integer**

  The sum of the two inputs.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello
```

Challenge 2:centuryFromYear

Given a year, return the century it is in. The first century spans from the year 1 up to and including the year 100, the second - from the year 101 up to and including the year 200, etc.

Example

- For `year = 1905`, the output should be `centuryFromYear(year) = 20`;
- For `year = 1700`, the output should be `centuryFromYear(year) = 17`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] integer year**

  A positive integer, designating the year.

  Guaranteed constraints:
  `1 ≤ year ≤ 2005`.

- **[output] integer**

  The number of the century the year is in.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```

Challenge 3:checkPalindrome

Given the string, check if it is a palindrome.

Example

- For `inputString = "aabaa"`, the output should be `checkPalindrome(inputString) = true`;

For `inputString = "abac"`, the output should be
`checkPalindrom` Given the string, check if it is a palindrome.

Example

- For `inputString = "aabaa"`, the output should be `checkPalindrome(inputString) = true`;
- For `inputString = "abac"`, the output should be `checkPalindrome(inputString) = false`;

- For `inputString = "a"`, the output should be `checkPalindrome(inputString) = true`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] string inputString**

  A non-empty string consisting of lowercase characters.

  Guaranteed constraints:
  `1 ≤ inputString.length ≤ 10^5`.

- **[output] boolean**

  `true` if `inputString` is a palindrome, `false` otherwise.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```

- `e(inputString) = false`;
- For `inputString = "a"`, the output should be `checkPalindrome(inputString) = true`.

Input/Output

- **[execution time limit] 4 seconds (py3)**
- **[input] string inputString**

  A non-empty string consisting of lowercase characters.

  Guaranteed constraints:
  `1 ≤ inputString.length ≤ 10^5`.

- **[output] boolean**

  `true` if `inputString` is a palindrome, `false` otherwise.

[Python 3] Syntax Tips

```
# Prints help message to the console
# Returns a string
def helloWorld(name):
    print "This prints to the console when you Run Tests"
    return "Hello, " + name
```

Challenge 4:adjacentElementsProduct

Given an array of integers, find the pair of adjacent elements that has the largest product and return that product.

Example

For `inputArray = [3, 6, -2, -5, 7, 3]`, the output should be `adjacentElementsProduct(inputArray) = 21`.

`7` and `3` produce the largest product.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] array.integer inputArray**

  An array of integers containing at least two elements.

  Guaranteed constraints:
  `2 ≤ inputArray.length ≤ 10`,
  `-1000 ≤ inputArray[i] ≤ 1000`.

- **[output] integer**

  The largest product of adjacent elements.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```

Challenge 5:shape Area

Below we will define an `n`-interesting polygon. Your task is to find the area of a polygon for a given `n`.
A `1`-interesting polygon is just a square with a side of length `1`. An `n`-interesting polygon is obtained by taking the `n - 1`-interesting polygon and appending `1`-interesting polygons to its rim, side by side. You can see the `1`-, `2`-, `3`- and `4`-interesting polygons in the picture below.

Example

- For `n = 2`, the output should be `shapeArea(n) = 5`;
- For `n = 3`, the output should be `shapeArea(n) = 13`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] integer n**

  Guaranteed constraints:
  $1 \leq n < 10^4$.

- **[output] integer**

  The area of the `n`-interesting polygon.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```

Challenge 6: Make Array consecutive 2

Ratiorg got `statues` of *different* sizes as a present from CodeMaster for his birthday, each statue having an non-negative integer size. Since he likes to make things perfect, he wants to arrange them from smallest to largest so that each statue will be bigger than the previous one exactly by `1`. He may need some additional statues to be able to accomplish that. Help him figure out the minimum number of additional statues needed.

Example

For `statues = [6, 2, 3, 8]`, the output should be `makeArrayConsecutive2(statues) = 3`.
Ratiorg needs statues of sizes `4`, `5` and `7`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] array.integer statues**

  An array of *distinct* non-negative integers.

  Guaranteed constraints:
  `1 ≤ statues.length ≤ 10`,
  `0 ≤ statues[i] ≤ 20`.

- **[output] integer**

  The minimal number of statues that need to be added to existing `statues` such that it contains every integer size from an interval `[L, R]` (for some `L, R`) and no other sizes.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```

Challenge 7:almost increasing sequence

Given a sequence of integers as an array, determine whether it is possible to obtain a strictly increasing sequence by removing no more than one element from the array.

Note: sequence a_0, a_1, ..., a_n is considered to be a strictly increasing if $a_0 < a_1 < \ldots < a_n$. Sequence containing only one element is also considered to be strictly increasing.

Example

- For `sequence = [1, 3, 2, 1]`, the output should be `almostIncreasingSequence(sequence) = false`.

  There is no one element in this array that can be removed in order to get a strictly increasing sequence.

- For `sequence = [1, 3, 2]`, the output should be `almostIncreasingSequence(sequence) = true`.

You can remove `3` from the array to get the strictly increasing sequence `[1, 2]`. Alternately, you can remove `2` to get the strictly increasing sequence `[1, 3]`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] array.integer sequence**

  Guaranteed constraints:
  `2 ≤ sequence.length ≤ 10^5`,
  `-10^5 ≤ sequence[i] ≤ 10^5`.

- **[output] boolean**

  Return `true` if it is possible to remove one element from the array in order to get a strictly increasing sequence, otherwise return `false`.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```

Challenge 8:Matrix Emenets sum

After becoming famous, the CodeBots decided to move into a new building together. Each of the rooms has a different cost, and some of them are free, but there's a rumour that all the free rooms are haunted! Since the CodeBots are quite superstitious, they refuse to stay in any of the free rooms, **or any of the rooms below any of the free rooms**.

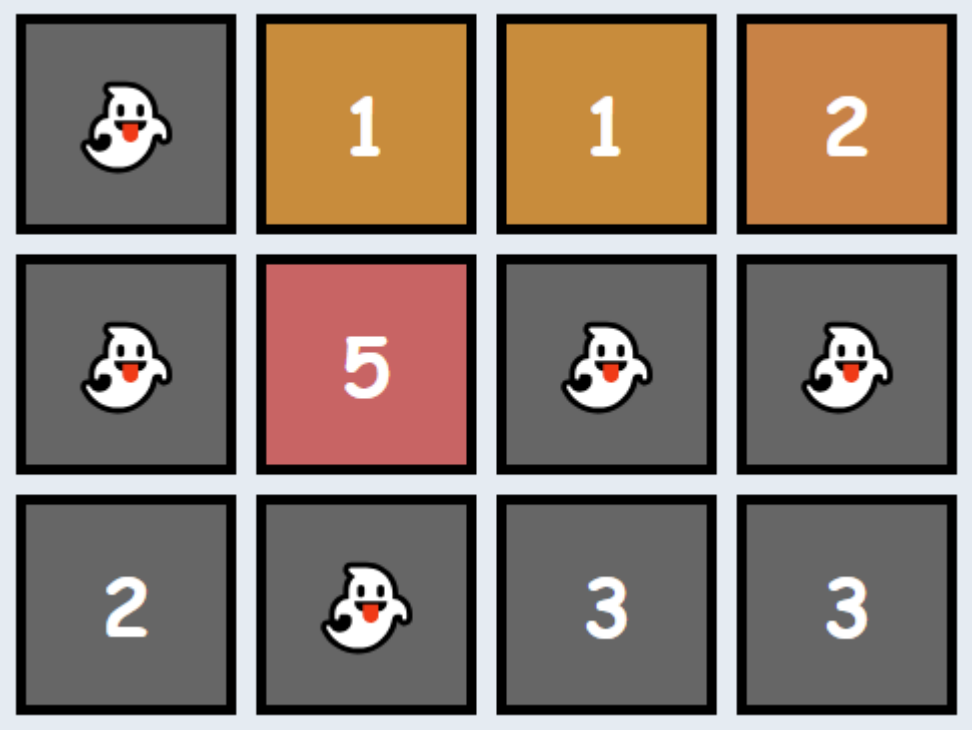
Given `matrix`, a rectangular matrix of integers, where each value represents the cost of the room, your task is to return the total sum of all rooms that are suitable for the CodeBots (ie: add up all the values that don't appear below a `0`).

Example

- For

```
matrix = [[0, 1, 1, 2],
          [0, 5, 0, 0],
          [2, 0, 3, 3]]
```

the output should be
`matrixElementsSum(matrix) = 9`.

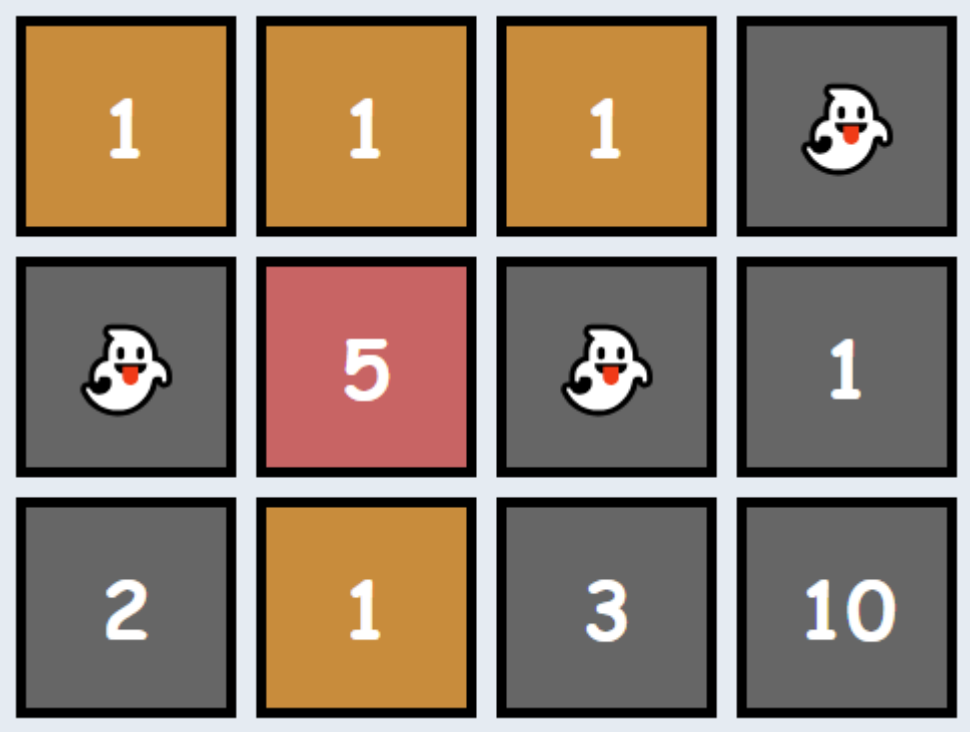


There are several haunted rooms, so we'll disregard them as well as any rooms beneath them. Thus, the answer is `1 + 5 + 1 + 2 = 9`.

- For

```
matrix = [[1, 1, 1, 0],
          [0, 5, 0, 1],
          [2, 1, 3, 10]]
```

the output should be `matrixElementsSum(matrix) = 9`.



Note that the free room in the final column makes the full column unsuitable for bots (not just the room directly beneath it). Thus, the answer is `1 + 1 + 1 + 5 + 1 = 9`.

Input/Output

- **[execution time limit] 3 seconds (java)**
- **[input] array.array.integer matrix**

  A 2-dimensional array of integers representing the cost of each room in the building. A value of `0` indicates that the room is haunted.

  Guaranteed constraints:

  `1 ≤ matrix.length ≤ 5`,

  `1 ≤ matrix[i].length ≤ 5`,

  `0 ≤ matrix[i][j] ≤ 10`.

- **[output] integer**

  The total price of all the rooms that are suitable for the CodeBots to live in.

[Java] Syntax Tips

```
// Prints help message to the console
// Returns a string
//
// Globals declared here will cause a compilation error,
// declare variables inside the function instead!
```

```
String helloWorld(String name) {
    System.out.println("This prints to the console when you Run Tests");
    return "Hello, " + name;
}
```