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6. Vectorize function

In this exercise, you will learn how to vectorize a function that can only deal with scalar inputs without using a `for` loop.

Scalar function

1.0/1 point (graded)

Let's start with writing a scalar function `scalar_function`, which will apply the following operation with input `x` and `y`.

$$f(x,y) = \begin{cases} x \cdot y, & \text{if } x \leq y \\ x/y, & \text{else.} \end{cases}$$

Note that `x` and `y` are scalars.

Available Functions: You have access to the NumPy python library as np

Grader note:: If the grader appears unresponsive and displays “Processing", it means (most likely) it has crashed. Please resubmit your answers, and leave a

message in the forum and we will work on fixing it as soon as possible.

```
def scalar_function(x, y):
    """
    Returns the f(x,y) defined in the problem statement.
    """
    #Your code here
    if x <= y:
        return x*y
    else:
        return x/y

```

Press ESC then TAB or click outside of the code editor to exit

Correct

Test results

See full output

CORRECT

See full output

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Vector function

1.0/1 point (graded)

`scalar_function` can only handle scalar input, we could use the function `np.vectorize()` turn it into a vectorized function. Note that the input argument of `np.vectorize()` should be a scalar function, and the output of `np.vectorize()` is a new function that can handle vector input.

Please write a vector function `vector_function`, which will apply the operation

$f(x, y)$ defined above element-wisely with input vectors with same dimension `x` and `y`.

Available Functions: You have access to the NumPy python library as np, and the function `scalar_function` in the previous exercise.

Grader note:: If the grader appears unresponsive and displays “Processing", it means (most likely) it has crashed. Please resubmit your answers, and leave a message in the forum and we will work on fixing it as soon as possible.

```
def vector_function(x, y):
    """
    Make sure vector_function can deal with vector input x,y
    """
    # Your code here
    return np.vectorize(scalar_function)(x, y)

```

Press ESC then TAB or click outside of the code editor to exit

Correct

Test results

See full output

CORRECT

See full output

Submit You have used 2 of 25 attempts

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doc string of scalar_function in starter code is a bit misleading

Not a question but a comment - while the question itself makes it clear that the goal is to imp...

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