

Homework 1 - Python Programming



One way to represent a matrix in python is to use a list of rows of a matrix (a list of lists or a nested list). For example the matrix

$$\begin{bmatrix} 0 & 2 & -1 \\ -2 & 0 & -4 \\ 1 & 4 & 0 \end{bmatrix}$$

Can be represented as:

```
A = [ [0 2 -1], [-2 0 -4], [1 4 0] ]
```

Your task is to write a function named `mul` that receives two matrices as arguments and returns their product as a matrix:

```
def mul (A,B) :  
    """  
    returns the product of the matrix A by the matrix B  
    returns the empty list [] if the matrix dimensions  
    are not consistent for multiplication  
    """  
    # function body  
  
# test the function  
A = [[1, 0, 0],  
     [0, 0, 3],  
     [0, 2, 0]];  
  
B = [[1, 1],  
     [0, .5],  
     [2, 1/3.0]];  
  
C = [[ 1, 0, 0 ],  
     [ 0, 0, 0.5],  
     [ 0, 1/3.0, 0]]  
  
print mul (A,B) ;  
print mul (B,A) ;  
print mul (A,C)
```

The output of the above piece of code is

```
[[1, 1.0], [6, 1.0], [0, 1.0]]  
[]  
[[1, 0.0, 0.0], [0, 1.0, 0.0], [0, 0.0, 1.0]]
```

- The arguments A and B must be of the above format (nested list). **Do not use numpy arrays or matrices.**
- Assume each matrix is consistent (are rows are of the same size). But the dimensions might to be consistent for multiplication (in which case you need to return the empty list [])