3.1.3 Finger Exercise: Python list refresher questions

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Finger Exercises 1 due Aug 3, 2023 05:00 IST Completed

MO2.3

In this course, we assume that you have already had some experience with Python. The questions in this Finger Exercise are meant to be a refresher on your understanding of Python lists and how they can be used to represent vectors and matrices of real numbers. As you will see throughout this course, we will make significant use of vectors and matrices, and so being able to implement them in Python is important.

Finally, as we mentioned in Section 2.1.5, we will be learning about and using NumPy throughout this course. However, initially, we will stick with standard Python lists for vector manipulation. We think this allows us to better contrast the differences between Python lists and NumPy `ndarray` objects. So, stay tuned for NumPy!

Problem: Using lists for vector manipulations

2/2 points (graded)

In these questions, we will look at some common vector manipulations and the results when using standard Python lists.

To begin, let's consider addition of two vectors. Consider the following Python code:

```
u = [1, 2, 3]
v = [4, 5, 6]
w = [u[0]+v[0], u[1]+v[1], u[2]+v[2]] # i.e. w = [5,7,9]

print( u+v == w )
```

What will this code print when run? If an error would occur at any point, select ERROR OCCURS.

- (•) False
- ( ) True
- ( ) ERROR OCCURS

✔

And now let's consider multiplication of a vector by a scalar. Consider the following Python code:

```
u = [1, 2, 3]
v = [2*u[0], 2*u[1], 2*u[2]] # i.e. v = [2,4,6]

print( v == 2*u )
```

What will this code print when run?

- (•) False
- ( ) True
- ( ) ERROR OCCURS

✔

Submit

Answers are displayed within the problem

Problem: Retrieving a matrix element using list indexing

2/2 points (graded)

In these questions, we will look at how to retrieve an element of a matrix using standard Python list indexing.

Consider the following Python code.

```
A = [ [1,2,3], [4,5,6] ]
```

What does `A[1][1]` evaluate to?

- 1
- 2
- 4
- 5 ✔
- ERROR OCCURS

What does `A[1,1]` evaluate to?

- 1
- 2
- 4
- 5
- ERROR OCCURS ✔

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Answers are displayed within the problem

Problem: Retrieving a matrix row or column using list indexing

4/4 points (graded)

In these questions, we will look at how to retrieve a row or column of a matrix using standard Python list indexing.

list indexing.

Again, consider the following Python code from above.

```
A = [ [1,2,3], [4,5,6] ]
```

What does `A[0][:]` evaluate to?

- [x] [1,2,3]
- [ ] [4,5,6]
- [ ] [1, 4]
- [ ] [[1], [4]]
- [ ] ERROR OCCURS

✔

What does `A[:][0]` evaluate to?

- [x] [1,2,3]
- [ ] [4,5,6]
- [ ] [1, 4]
- [ ] [[1], [4]]
- [ ] ERROR OCCURS

✔

What does `A[0,:]` evaluate to?

- [ ] [1,2,3]
- [ ] [4,5,6]
- [ ] [1, 4]
- [ ] [[1], [4]]
- [x] ERROR OCCURS

✔

What does `A[:,0]` evaluate to?

- [ ] [1,2,3]
- [ ] [4,5,6]
- [ ] [1, 4]

- ○ [[1], [4]]
- ◉ ERROR OCCURS ✔

Submit

ℹ Answers are displayed within the problem

SOLUTION: The solution will be available shortly after the due date in Section 3.2.3.

‹ Previous Next ›