



Adamson University
College of Engineering
Computer Engineering Department



Experiment No. # 5
VECTOR SPACE OPERATIONS

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Schedule: M 7:00 – 10:00
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Objective

To apply and understand the essence, concepts, and principles of vector space operations

Algorithm

1. Type the main title of this activity as "Vector Operations and Its Applications"
2. On your GitHub, create a repository name Linear Algebra 58013
3. On your Colab, name your activity as Python Exercise 5.ipynb and save a copy to your GitHub repository

Coding Activity 5

Scaling

Scaling or scalar multiplication takes a scalar value and performs multiplication with a vector. Let's take the example below:

$$S = 5 \cdot A$$

We can do this in numpy through:

```
A = np.array([1,5,8,9])
S = 5*A
S

S = np.multiply(5,A)
S
```

Dot Product

Python provides a very efficient method to calculate the dot product of two vectors. By using numpy.dot() method, which is available in the Numpy module.

```
import numpy as n
a = [5, 10, 2]
b = [2, 4, 3]
dotproduct = n.dot(a,b)
print('Dot product is:', dotproduct)
```

Cross Product

To find the cross product of two vectors, we will use numpy cross() function.

```
import numpy as np
p = [4, 2]
q = [5, 6]
product = np.cross(p,q)
print(product)
```



Answer:

Scaling

```
[4] import numpy as np

A = np.array([1, 5, 8, 9])
scalar = 5

S = np.multiply(scalar, A)
print("S:", S)
```

```
S1: [ 5 25 40 45]
S2: [ 5 25 40 45]
```

Dot Product

```
[10] import numpy as n
a = [5, 10, 2]
b = [2, 4, 3]
dotproduct = n.dot(a,b)
print('Dot product is:', dotproduct)
```

```
Dot product is: 56
```

Cross Product

```
[7] p = [4, 2]
q = [5, 6]
product = np.cross(p,q)
print(product)
```

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GitHub Permalink:

https://github.com/MNLLEMM/58013-Linear-Algebra/blob/d3883196fa8ee092175168be54fcb1744aee55b4/Python_Exercise_5.ipynb