**LINEAR ALGEBRA**

Laboratory No. # 5

**VECTOR SPACE OPERATIONS**

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Score

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| --- | --- | --- | --- | --- |
| **CRITERIA** | **Exceeds Expectations** | **Meets Expectations** | **Needs Improvement** | **Unsatisfactory** |
| Functionality  (60 points) |  |  |  |  |
| Completeness  (20 points) |  |  |  |  |
| Structure  (20 points) |  |  |  |  |

**Remarks:**

*Submitted by:*

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**<Monday 7:00-10:00> / <58013>**

*Submitted to*

**<Ms. Maria Rizette Sayo>**

<Facilitator>

*Date Performed:*

**14-10-2023**

*Date Submitted*

**15-10-2023**

**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:



We can do this in numpy through:

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| 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.

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| 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.

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