Mths for ML

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1. Addition and subtraction

```
import numpy as np
A = np.array([[1, 2], [3, 4]])
B = np.array([[5, 6], [7, 8]])
print(" Addition: \n", A + B)
print("Subtraction: \n", B – A)
```

2. Scalar Multiplication

```
import numpy as np
A = np.array([[1, 2], [3, 4]])
B = np.array([[5, 6], [7, 8]])
print(" Addition: \n", A + B)
print("Subtraction: \n", B – A)
C = 2 * A
print("Scalar Multiplication: \n", C)
```

3. Matrix Multiplication

```
result = np.dot(A, B)
print("Matrix Multiplication: \n", result)
```

Determinants

Scalar value that provides information about a matrix's properties

It'll calculate square matrices

Det(A)=0, The matrix A is singular
Det(a)!=0, A is invertible

Geometric interpretation

```
import numpy as np
A = np.array([[2, 3], [5, 7]])
determinant = np.linalg.det(A)
print("Determinant: ", determinant)
```

Inverse of matrices

1. Denoted as A(-1)
2. Inverse is the identity matrix: A X A(1)=1
3. Matrix is invertible only if determinants(A)=/ 0

Eigenvalues and Eigenvectors

Both are properties of square matrices that describe transformations

Special Matrices

Identity Matrices

I = np.eye(5)
Print("identity Matrix \n", I)

Zero matrices

```
z = np.zeros((2, 2))
print("Zero Matrix: \n", z)
```

Diagonal Matrix

D = np.diag([1, 2, 3])
Print("Diagonal Matrix\n", D)

Identity Matrix

```
I = np.eye(5)
print("Identity Matrix \n", I)
```

Zero matrix

```
Z = np.zeros((2, 3))
print("Zero Matrix \n", Z)
```

Diagonal Matrix

```
D = np.diag([1, 2, 3])
print("Diagonal Matrix \n", D)
```

Calculus for machine learning)Derivatives)

Derivative:-
Measures the rate at which a function changes with respect to it's input.