12] Numpy .linalg sub-library

System of linear equations

```
A = np.array([[
        [4, -3, 1],
        [2, 1, 3],
        [-1, 2, -5]
    ], dtype = np.dtype(float))

b = np.array([[-10, 0, 17]], dtype = np.dtype
        (float))

print("Matrix A:")
print(A)
print("\n Array b:")
print(b)
```

```
Matrix A:
 [[ 4. -3.  1.]
  [ 2.  1.  3.]
  [-1.  2. -5.]]

Array b:
 [-10.  0.  17.]
```

Date No

```
print (f"shape of A : {np.shape(A)} ")
print (f"Shape of b : {np. shape (b)} ")
```

Shape of A: (3, 3)
Shape of b: (3,)

```
x = np.linalg.solve(A, b)
print (f"Solution : {x}")
```

Solution : [1 4. -2.]

```
d= np.linalg.det(A)
print (f"determinant of matrix A : {d:.2f}")
```

Determinant of matrix A : -60.00
(Non-zero / Non Singular)

*] If a system has no unique solution it will output the following linAlgError

~~Ling~~ LinAlg Error: Singular Matrix