End Semester Lab Exam
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Group 2

Given the transformations, verify whether it is linear or not for a particular vector and also plot the functions

$$T : R^3 -> R^3$$

$$T(a, b, c) = (a + b, a - b, c)$$

In [10]:

```
import matplotlib.pyplot as plt
from mpl_toolkits.mplot3d import Axes3D
import numpy as np
import math
```

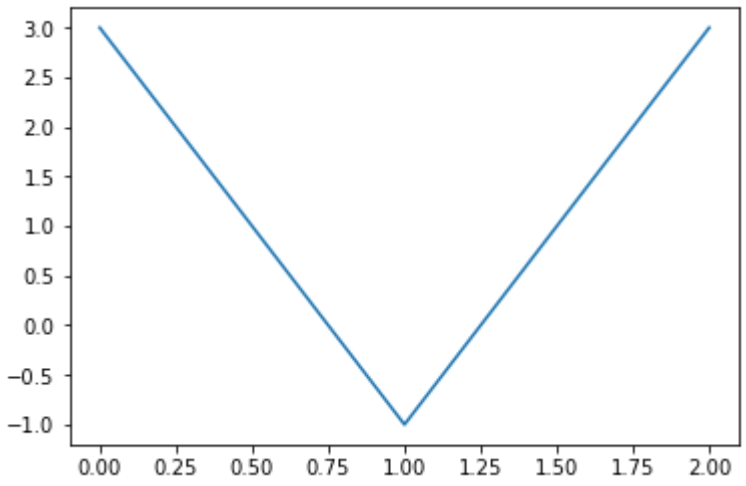
In [22]:

```
def trans(x,y,z):
    return (x+y,x-y,z)

def func(x1,x2,x3):
    t = trans(x1,x2,x3)
    print("The transformation is :",t)
    v1 = [1,2,3]
    plt.plot(t)
    plt.show()

func(1,2,3)
```

```
The transformation is : (3, -1, 3)
```



In [24]:

```
def transformation(x,y,z):
    return(x+y,x-y,z)

def check(x1,y1,x2,y2,z):
    t=transformation(x1+x2,y1+y2,z)
    print("T(v1+v2)=",t)
    v1=transformation(x1,y1,z)
    v2=transformation(x2,y2,z)
    print("T(v1)+T(v2)=","(",v1[0]+v2[0],",",v1[1]+v2[1],",",v1[2]+v2[2],")")
    if(t[0]==v1[0]+v2[0] and t[1]==v1[1]+v2[1]):
        print("It is a linear transformation:")
    else:
        print("not a linear transformation")

check(4,1,2,3,5)
```

```
T(v1+v2)= (10, 2, 5)
T(v1)+T(v2)= ( 10 , 2 , 10 )
It is a linear transformation:
```