In [1]:

```
%run CPL_Library.ipynb  # Running the entire library in one line because
                        # importing does not work with JupyterLab
```

Question 1

In [2]:

```
print("The augmented matrix is: ")
A,ro,co=read_matrix('As3matrixA.txt')
print_matrix(A,ro,co)
GJ, d=gauss_jordan(A,ro,co)
if GJ!=None:
    print("Solutions are : ")
    for i in range(ro):
        print(ROUND(GJ[i][ro]),2)
else:
    print("No unique solution")
```

```
The augmented matrix is: 

1    1    1    1    13

2    3    0    -1    -1

-3    4    1    2    10

1    2    -1    1    1


Solutions are : 
2.0 2
-0.0 2
6.0 2
5.0 2
```

Question 2

In [3]:

```
print("The augmented matrix is: ")
B,ro,co=read_matrix('As3matrixB.txt')
print_matrix(B,ro,co)
GJ, d=gauss_jordan(B,ro,co)
if GJ!=None:
    print("Solutions are : ")
    for i in range(ro):
        print(GJ[i][ro])
else:
    print("No unique solution")
```

```
The augmented matrix is: 

0    2    -3    -1

1    0    1    0

1    -1    0    3


Solutions are : 
1.0
-2.0
-1.0
```

Question 3

```
In [4]:
```

```python
print("The augmented matrix is: ")
C,ro,co=read_matrix('As3matrixC.txt')
print_matrix(C,ro,co)
GJ, d=gauss_jordan(C,ro,co)
C2,ro,co=read_matrix('As3matrixC.txt')
if GJ!=None:
    # Finding the inverse and printing in rounded form
    # Also finding the matrix multiplication for verification and then rounding at the end
    M=get_inv(C,ro)
    MM,k,l=matrix_multiply(M,ro,ro,C2,ro,ro) # using only n x n matrix i.e. unaugmented ma
trix
    M=round_matrix(M)
    print("The inverse matrix is: ")
    print_matrix(M,ro,ro)
    print("Verification: after multiplying the matrix and its inverse, we get : ")
    MM=round_matrix(MM)
    print_matrix(MM,ro,ro)
else:
    print("No unique solution")
```

```
The augmented matrix is:

0    2    1    1    0    0

4    0    1    0    1    0

-1    2    0    0    0    1


The inverse matrix is:

-0.33    0.33    0.33

-0.17    0.17    0.67

1.33    -0.33    -1.33


Verification: after multiplying the matrix and its inverse, we get :

1.0    0    0

0    1.0    0.0

0    0    1.0
```

Question 4

In [5]:

```
print("The augmented matrix is: ")
D,ro,co=read_matrix('As3matrixD.txt')
print_matrix(D,ro,co)
GJ, d=gauss_jordan(D,ro,co)
if GJ!=None:
    print("Determinant = "+str(d))
else:
    print("No unique solution")
```

```
The augmented matrix is:

1    4    2    3    1    0    0    0

0    1    4    4    0    1    0    0

-1    0    1    0    0    0    1    0

2    0    4    1    0    0    0    1


Determinant = 65.0
```

In [ ]: