

## ***MA202: Tutorial 3***

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**Q10.**

We are given with the equation,

$$3x_1 - x_2 + 0x_3 + 0x_4 = 0$$

$$5x_1 - 13x_2 + 8x_3 + 0x_4 = 0$$

$$0x_1 + 2x_2 - 7x_3 + 5x_4 = 0$$

$$0x_1 + 0x_2 - x_3 + x_4 = 200$$

This can be easily implemented for the Gauss elimination procedure.

After running the code, we get,

$$x_1 = 200$$

$$x_2 = 600$$

$$x_3 = 850$$

$$x_4 = 950$$

Here F is taken as force of 2000Kg which means F is 20000N, considering g to be 10.

```
def seidel(a, x ,b):
    #Finding length of a
    n = len(a)
    # for loop for 4 times as to calculate x1, x2, x3, x4
    for j in range(0, n):
        # temp variable d to store b[j]
        d = b[j]

        # to calculate respective x1, x2, x3, x4
        for i in range(0, n):
            if(j != i):
                d-=a[j][i] * x[i]

    # updating the value of our solution
```

```
        x[j] = d / a[j][j]
    # returning our updated solution
    return x

n = 4
a = []
b = []
# initial solution
x = [0, 0, 0, 0]
a = [[3, -1, 0, 0], [5, -13, 8, 0], [0, 2, -7, 5], [0, 0, -1, 1]]
b = [0, 0, 0, 100]
print(x)

#loop run for m times depending on m the error value
for i in range(0, 400):
    x = seidel(a, x, b)
    #print each time the updated solution
print(x)
```