Solving Linear Equation

Latihan:

1. Diberikan sistem persamaan linier 4 variabel.
2. Periksa apakah matriks koefisien bersifat **dominasi diagonal** secara programatik.
3. Jika **tidak dominan diagonal**, tampilkan pesan kesalahan.
4. Jika **dominan diagonal**, gunakan metode **Gauss-Seidel** dengan:
    - Maksimal iterasi: 20
    - Nilai awal semua variabel: **0**
    - Ambang batas konvergensi **ϵ = 0.0xx**, di mana `xx` adalah dua digit jam saat pengerjaan.

> 💡 *misal
>
> Pukul : 20:02
>
> **ϵ = 0.002**

```
x = [
   [
      [8, 4, 2],
      [1, 6, 3],
      [5, 6, 12]
   ],
   [
      [12, -7, -1],
      [1, -7, 2],
      [8, -1, 12]
   ],
```

```
    [
        [4, 2, 7],
        [3, -7, 5],
        [2, -1, 3]
    ],
    [
        [14, 2, 1],
        [1, 8, 4],
        [9, 8, 18]
    ],
    [
        [1, 3, 6],
        [9, 1, 12],
        [15, 18, 1]
    ]
]
y = [
    [10, 12, 15],
    [21, 12, 4],
    [8, 4, 5],
    [7, 2, 6],
    [4, 7, 6]
]
```

Output yang Diharapkan:

- Jika matriks **tidak dominan diagonal** → Print error.
- Jika **dominansi terpenuhi** → Tampilkan hasil setiap iterasi hingga maksimal 20 kali atau hingga konvergen:
    - Nilai x_1, x_2, x_3, dan x_4 di setiap iterasi.
    - Informasi apakah metode konvergen atau tidak.

```
Matrix #1
Diagonally Dominant
Iteration #1 : [ 1.25        1.79166667 -0.16666667]
Difference = 2.190969470855818
Not Convergent
Iteration #2 : [0.39583333 2.01736111 0.07638889]
Difference = 0.9163049054675799
Not Convergent
Iteration #3 : [0.22222222 1.92476852 0.19502315]
Difference = 0.22975703161001526
Not Convergent
Iteration #4 : [0.23885995 1.86267843 0.2191358 ]
Difference = 0.06865429955384911
Convergent

Matrix #2
Diagonally Dominant
Iteration #1 : [ 1.75       -1.46428571 -0.95535714]
Difference = 2.473729961711542
Not Convergent
Iteration #2 : [ 0.81622024 -1.87064201 -0.36670033]
Difference = 1.1762597197414264
Not Convergent
Iteration #3 : [ 0.6282338  -1.72930955 -0.22959833]
Difference = 0.2722328425469943
Not Convergent
Iteration #4 : [ 0.7221029  -1.67672768 -0.28779591]
Difference = 0.12232423662530427
Not Convergent
Iteration #5 : [ 0.74792586 -1.68966656 -0.30608945]
Difference = 0.034189089310782864
Convergent

Matrix #3
Not Diagonally Dominant!
```