In [12]:

```
from sympy import *
```

In [13]:

```
import numpy as np
import galois
```

In [16]:

```
GF2=galois.GF(2);
GF2
```

Out[16]:

```
<class 'numpy.ndarray over GF(2)'>
```

In [21]:

```
#change the original M to be in field Z2
M = GF2([[1, 0, 1, 0], [1, 1, 0, 0], [0, 0, 1, 0]]);
M
```

Out[21]:

```
GF([[1, 0, 1, 0],
    [1, 1, 0, 0],
    [0, 0, 1, 0]], order=2)
```

In [22]:

```
GF2.row_reduce(M)
```

Out[22]:

```
GF([[1, 0, 0, 0],
    [0, 1, 0, 0],
    [0, 0, 1, 0]], order=2)
```