

1. Tabular Representation:

Full_addr						multi_bit				
name	id	cell	orient	id_connected_to	id_connected_from	name	id	cell	id_connected_to	id_connected_from
INPUT_a	1	6	3	4,5	null	INPUT_a	1	6	4,5,7,8	null
INPUT_b	2	7	2	4,6	null	INPUT_b	2	7	4,5,7,8	null
INPUT_carry	3	8	1	8,10	null	INPUT_carry	3	8	6,10	null
nand	4	0	1	5,6,11	1,2	xor	4	3	6,10	1,2
nand	5	0	6	7	1,4	nand	5	0	9	1,2
nand	6	0	4	7	2,4	nand	6	0	9	3,4
nand	7	0	0	8,9	5,6	nand	7	0	13	1,2
nand	8	0	0	9,10,11	3,7	xor	8	3	11,12	1,2
nand	9	0	4	12	7,8	nand	9	0	11,12	5,6
nand	10	0	4	12	3,8	xor	10	3	16	3,4
nand	11	0	2	13	4,8	nand	11	0	13	8,9
nand	12	0	0	14	9,10	xor	12	3	15	8,9
OUTPUT	13	5	2	null	11	nand	13	0	14	7,11
OUTPUT	14	5	1	null	12	OUTPUT	14	5	null	13
						OUTPUT	15	5	null	12
						OUTPUT	16	5	null	10

2. Matrix

a. Full-addr:

```
#full_addr
a = [
    [0,0,0,1,1,0,0,0,0,0,0,0,0,0],
    [0,0,0,1,0,1,0,0,0,0,0,0,0,0],
    [0,0,0,0,0,0,0,0,1,0,1,0,0,0],
    [1,1,0,0,1,1,0,0,0,0,1,0,0,0],
    [1,0,0,1,0,0,1,0,0,0,0,0,0,0],
    [0,1,0,1,0,0,1,0,0,0,0,0,0,0],
    [0,0,0,0,1,1,0,1,1,0,0,0,0,0],
    [0,0,1,0,0,0,1,0,1,1,1,0,0,0],
    [0,0,0,0,0,0,1,1,0,0,0,1,0,0],
    [0,0,1,0,0,0,0,1,0,0,0,1,0,0],
    [0,0,0,1,0,0,0,1,0,0,0,0,1,0],
    [0,0,0,0,0,0,0,0,0,1,1,0,0,1],
    [0,0,0,0,0,0,0,0,0,0,0,1,0,0],
    [0,0,0,0,0,0,0,0,0,0,0,0,1,0]]
```

i.

b. Multi_bit:

```

#multi_bit
b = matrix = [
    [0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0],
    [0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0],
    [0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0],
    [1, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0],
    [1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0],
    [0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0],
    [1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0],
    [1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0],
    [0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0],
    [0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1],
    [0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0],
    [0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1],
    [0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0],
    [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0],
    [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0],
    [0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0]
]

```

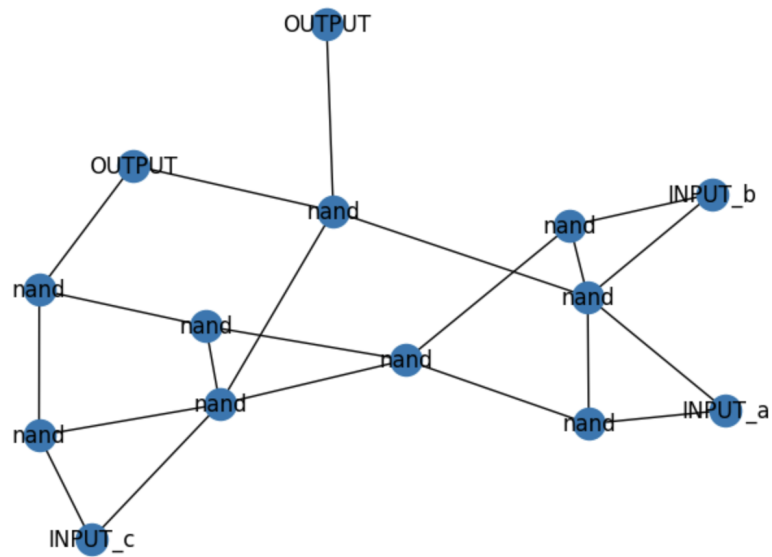
✓ 0.0s

i.

3. Networkx:

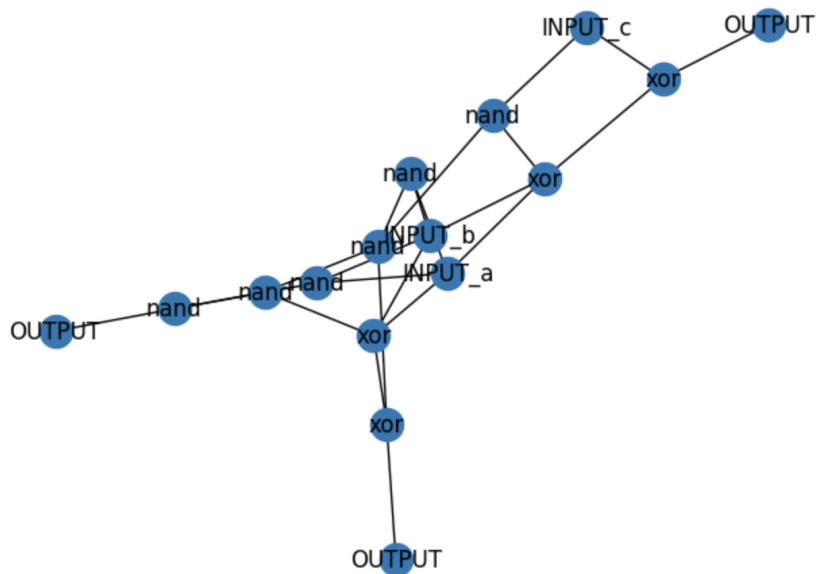
a. Full_addr

```
#full_addr
nx.draw(G_full, layout, with_labels=True, labels=labels)
✓ 0.1s
```



- i.
- b. Multi:

```
#multi_bit
layout_multi = nx.spring_layout(G_multi)
labels_multi= {idx: type for idx, type in enumerate(multi_nodes)}
nx.draw(G_multi, layout_multi, with_labels=True, labels=labels_multi)
✓ 0.0s
```



- i.
- 4. Pytorch object:

```
import torch
from torch_geometric.utils.convert import from_networkx
```

✓ 0.0s

```
from_networkx(G_full)
```

✓ 0.0s

Data(edge_index=[2, 42], type=[14], num_nodes=14)

+ Code

+ Markc

```
from_networkx(G_multi)
```

✓ 0.0s

Data(edge_index=[2, 46], type=[16], num_nodes=16)

a.