# BERKE GÜLMEN
# MERYEM GÜLMEN

**berkeDet:**

a method defined in terms of the functions meryemSign and meryemPer

# CURRENT SITUATION

$$\det(A) = \sum_{\sigma \in S_n} \operatorname{sgn}(\sigma) \prod_{i=1}^{n} a_{i,\sigma(i)}$$

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sgn(σ) = $(-1)^m$

σ = (3, 4, 5, 2, 1)

*σ:* (1 5), (3 4), (2 4), (1 2), (2 3)

m = 5 ⇒ sgn(σ) = −1

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► `meryemSign`

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lexicographical permutation

| | | |
|---|---|---|
| 1 | 2 | 3 |
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meryemPer ◀

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# meryemSign

- ✓ Always start with +
- ✓ For nxn matrix, from 1 to n (i: index)
- ✓ i times: copy and paste all previous signs as appended, respectively
- ✓ Copy and paste rule: alternate like this:
  reversed → original → reversed → original (and so on)

# meryemSign

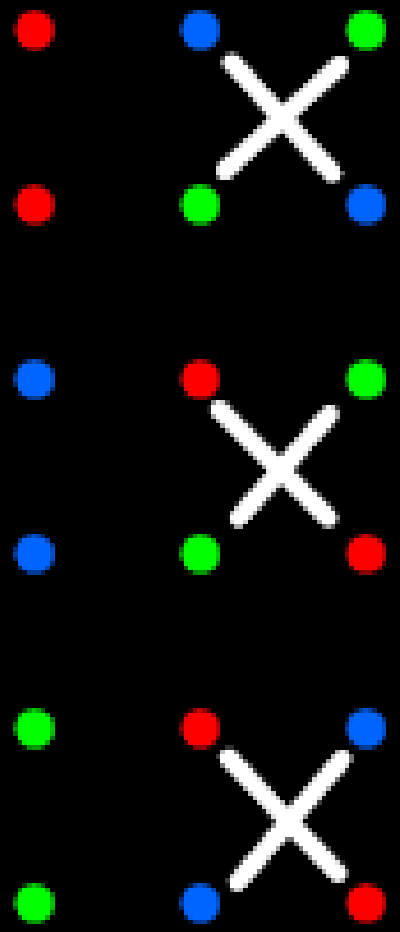
```python
def main (a : int = 5) -> None :
    b : list [str] = ["+"]
    for e in range (1, a + 1) :
        c = b [:]
        for d in range (e) :
            if d % 2 == 0 :
                f = ["-" if g == "+" else "+" for g in c]
            else :
                f = c [:]
            b . extend (f)
    with open ("meryemSign.txt", "w", encoding = "utf-8") as f :
        f . write ("\n" . join (b) + "\n")
if __name__ == "__main__" :
    main ()
```

# 2 x 2

meryemPer

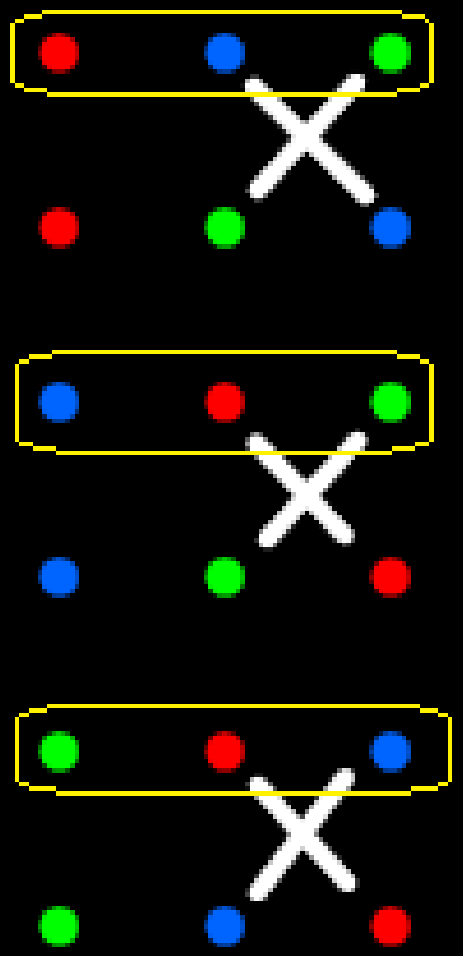
meryemPer

3 x 3



2 x 2

3 x 3



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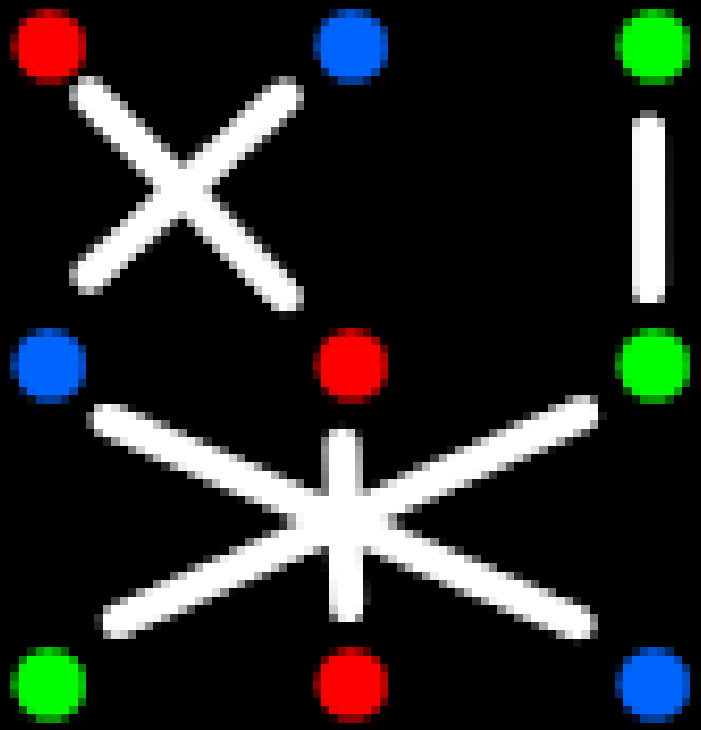
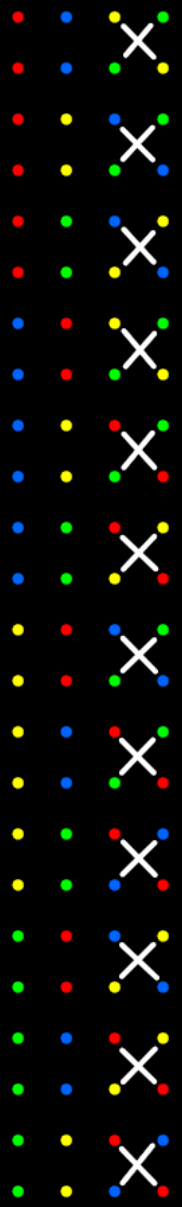
# 3 x 3

meryemPer



4 x 4



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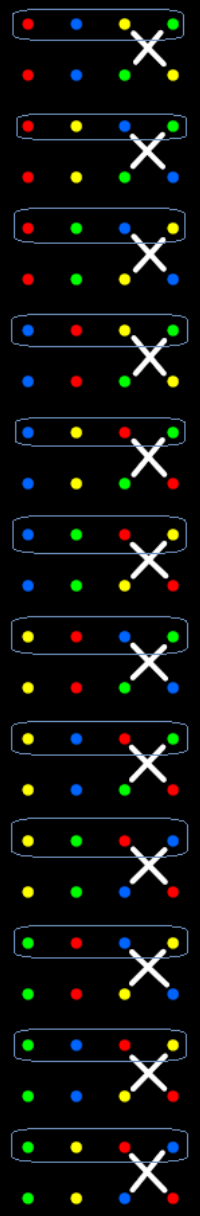
2 x 2

# 4 x 4



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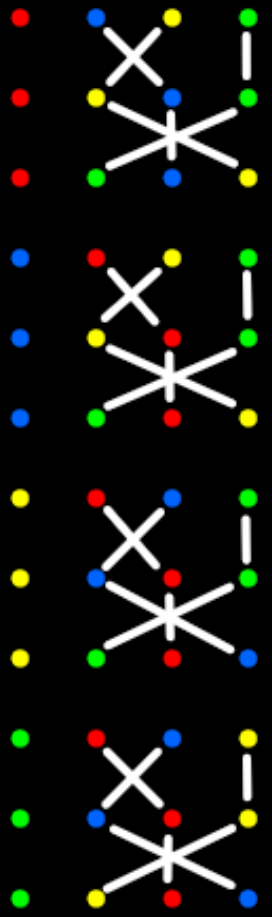
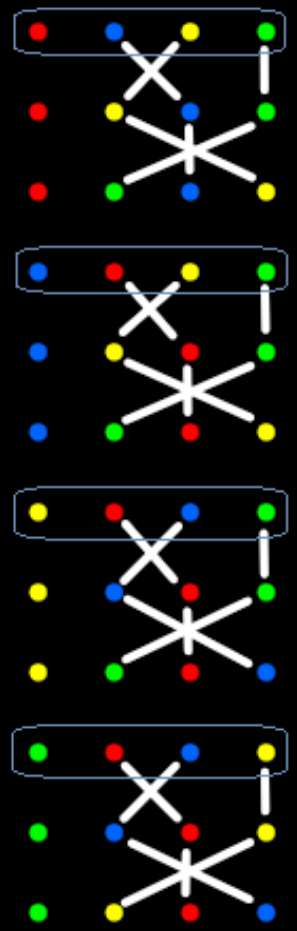
4 x 4



3 x 3

# 4 x 4



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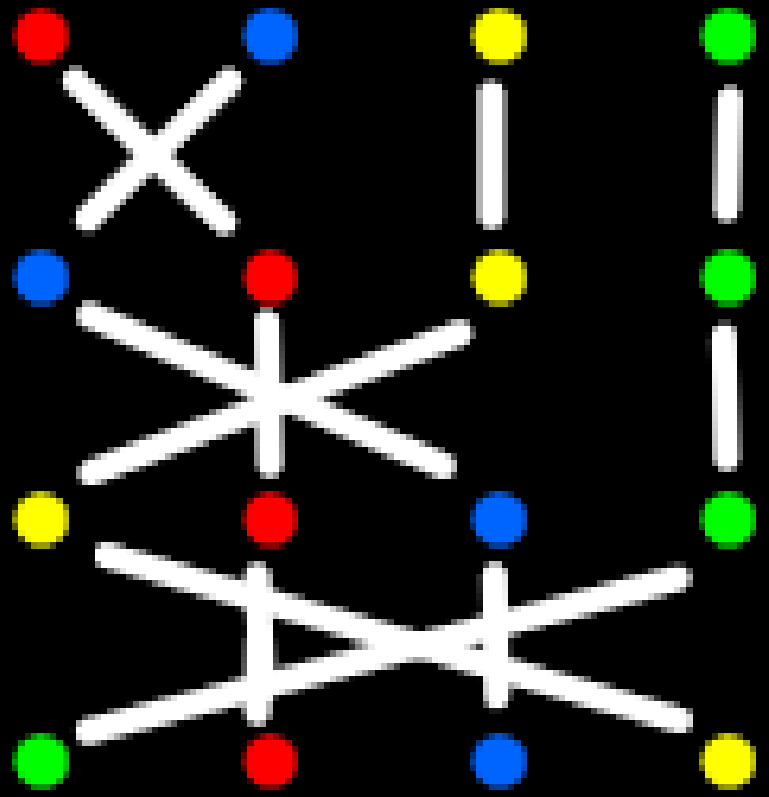
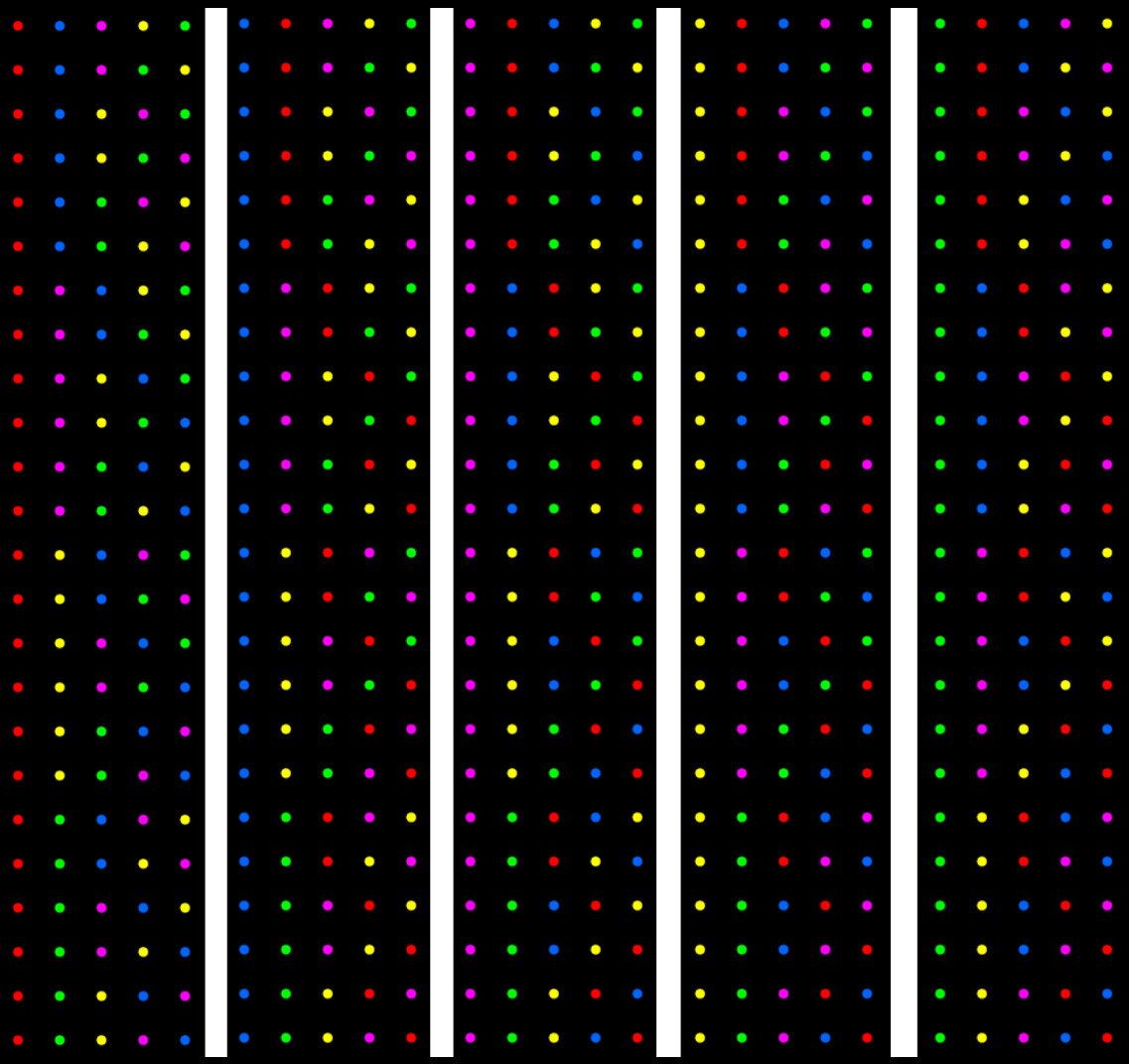


# 5 x 5



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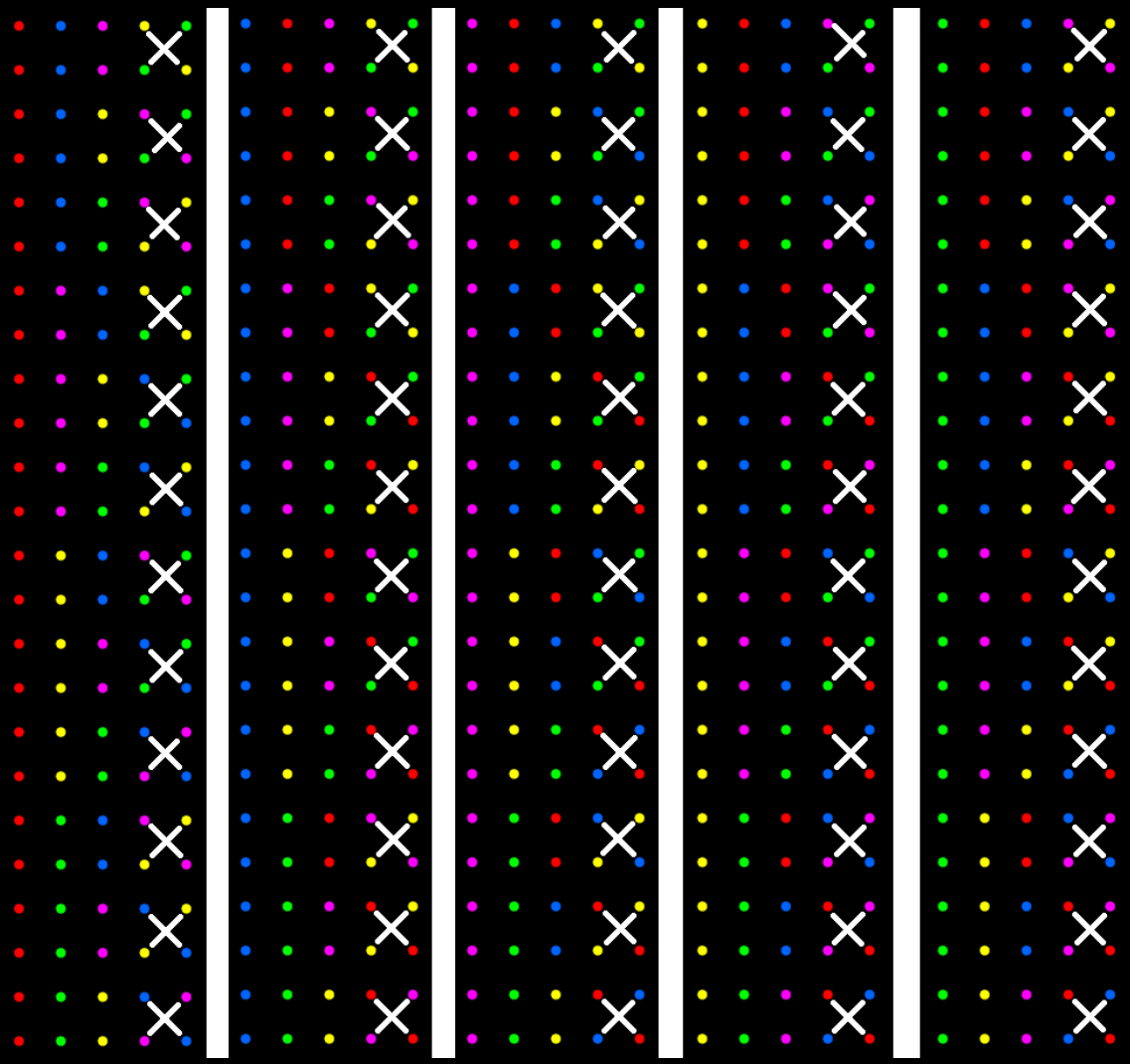
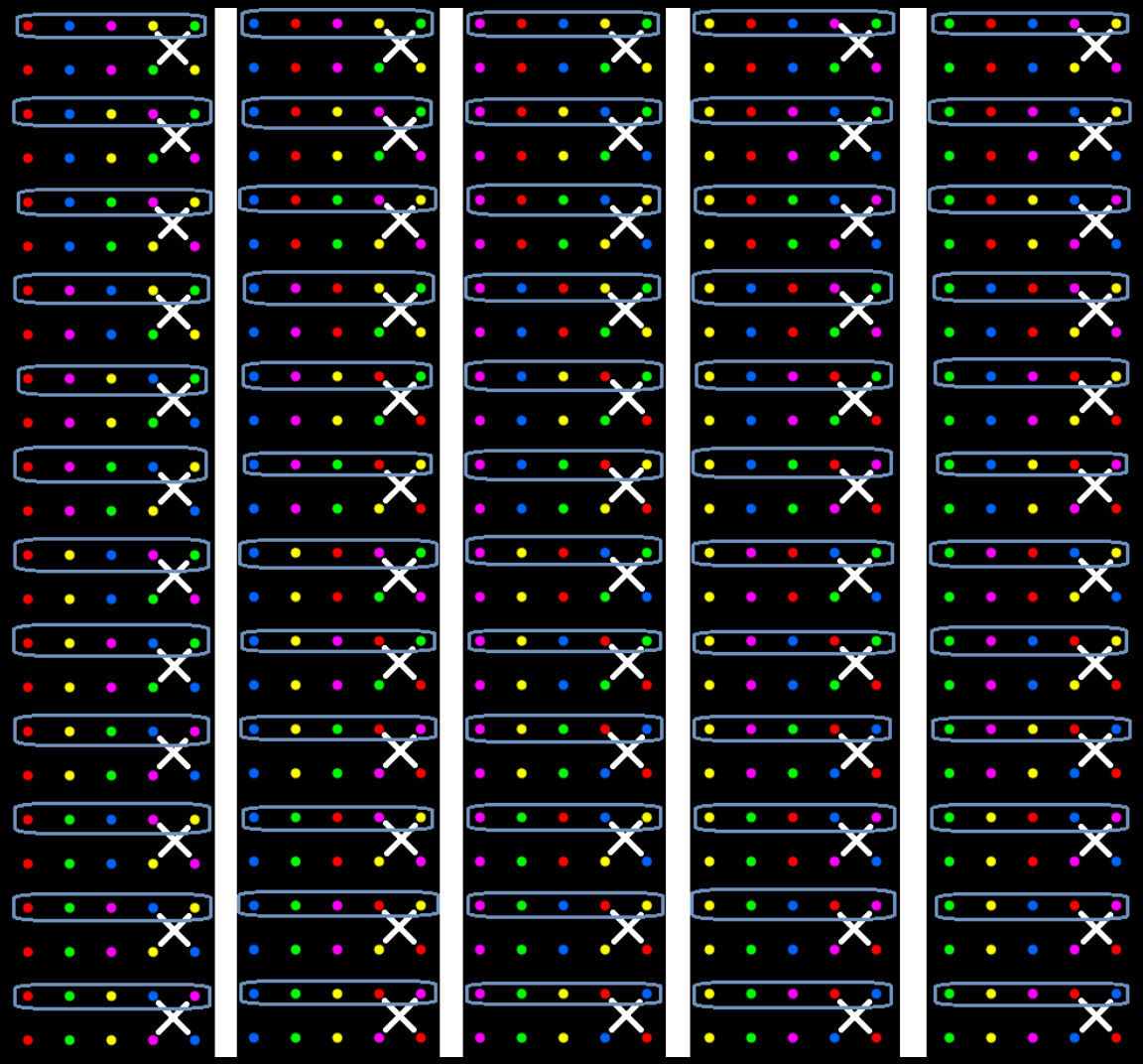


2 x 2

# meryemPer

5 x 5



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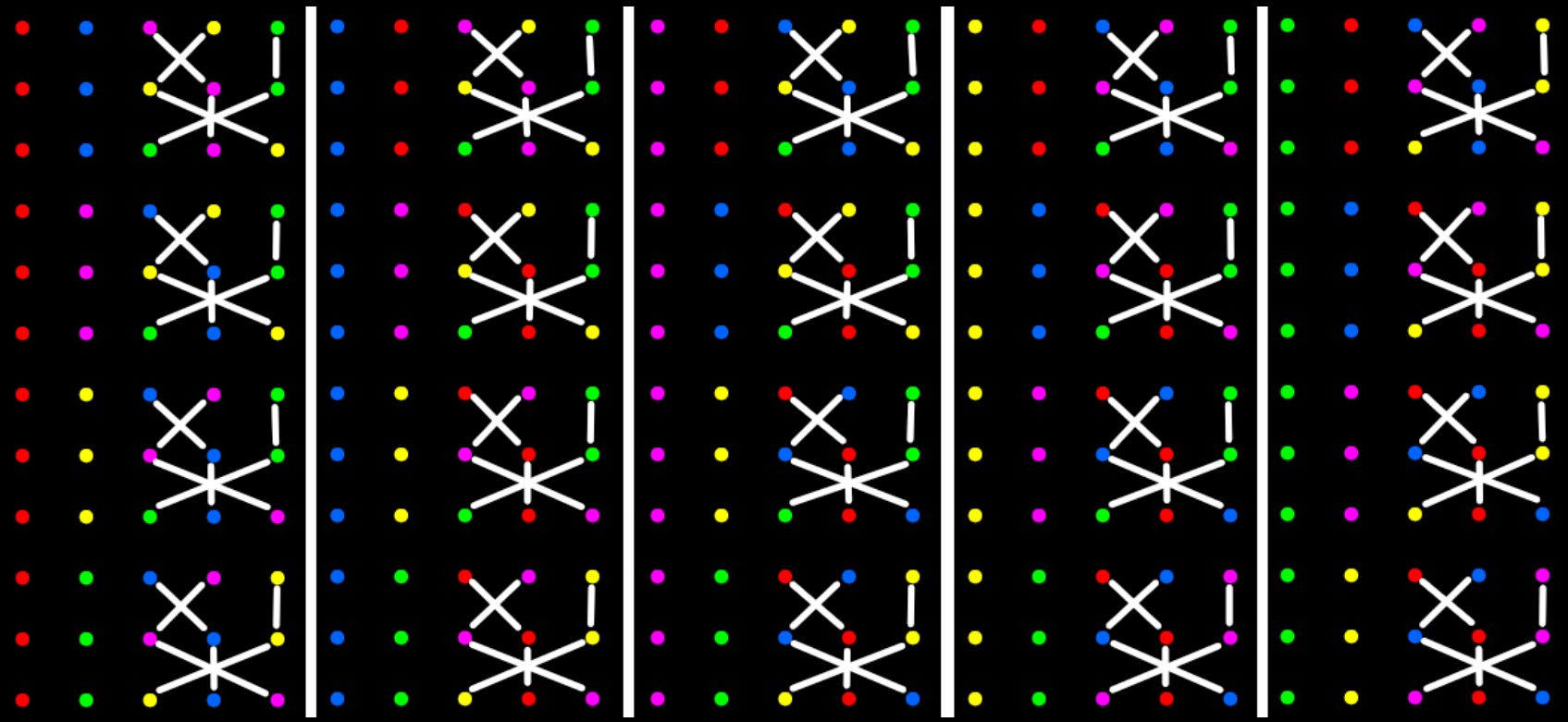

3 x 3

# meryemPer

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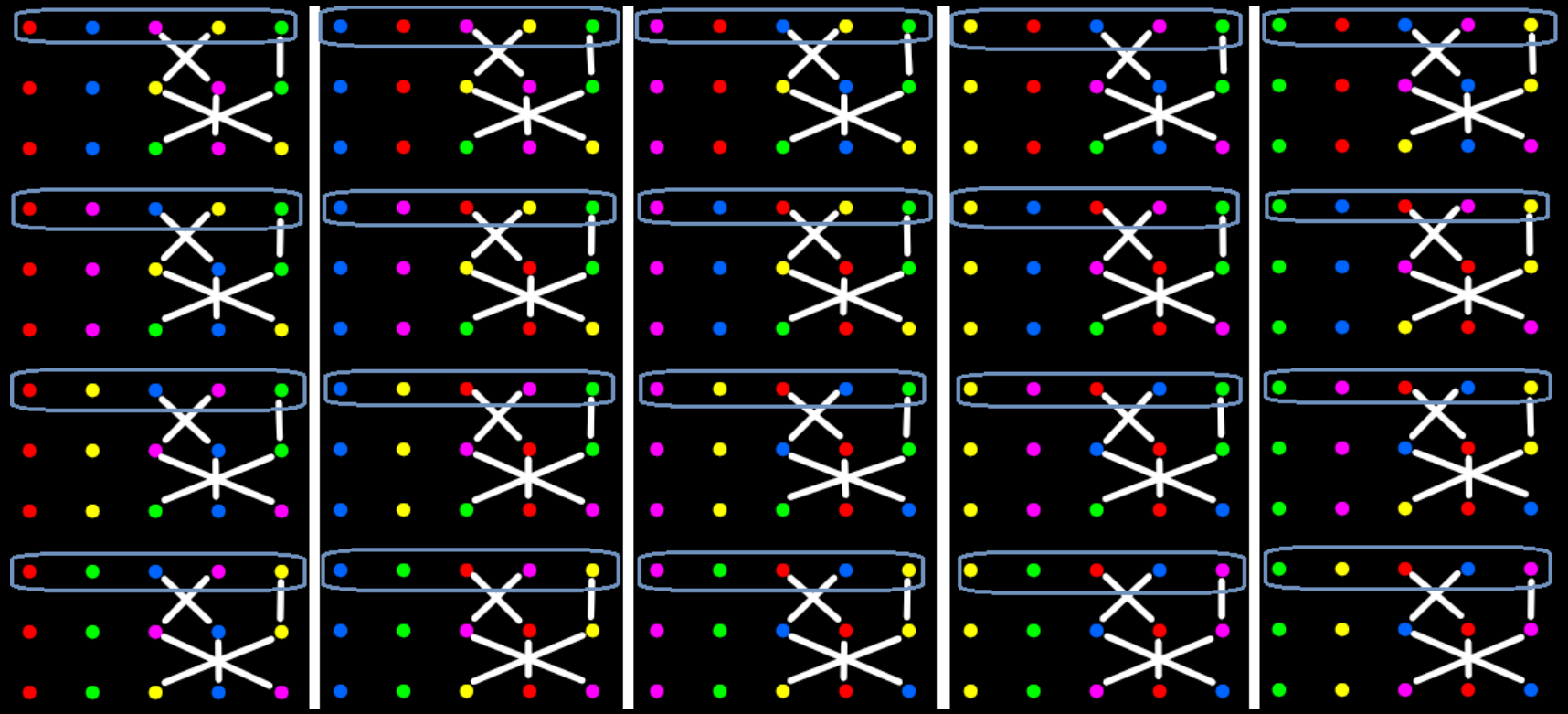

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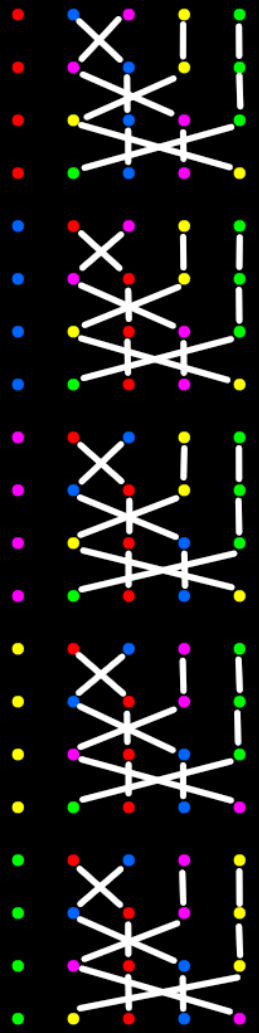

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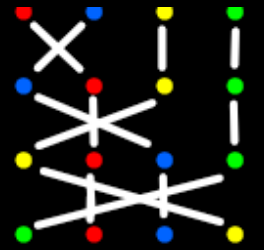

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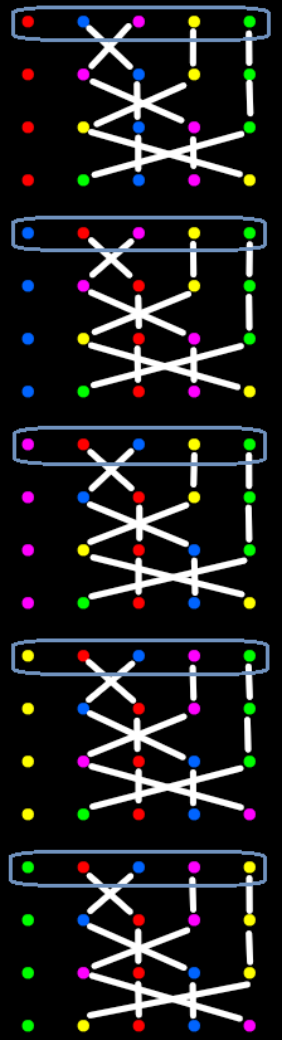

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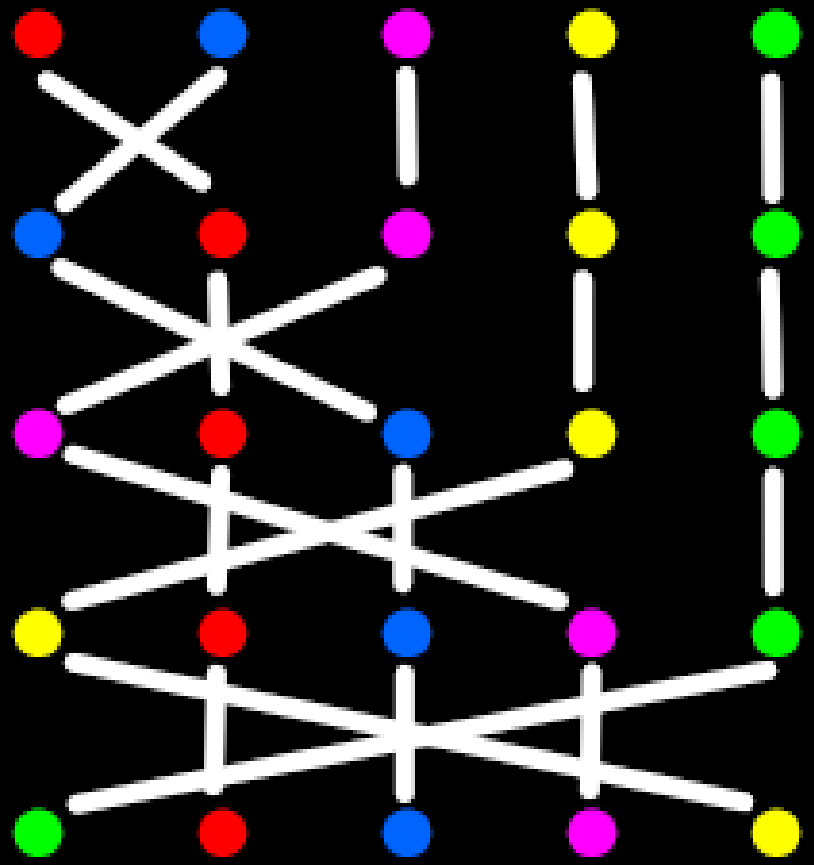
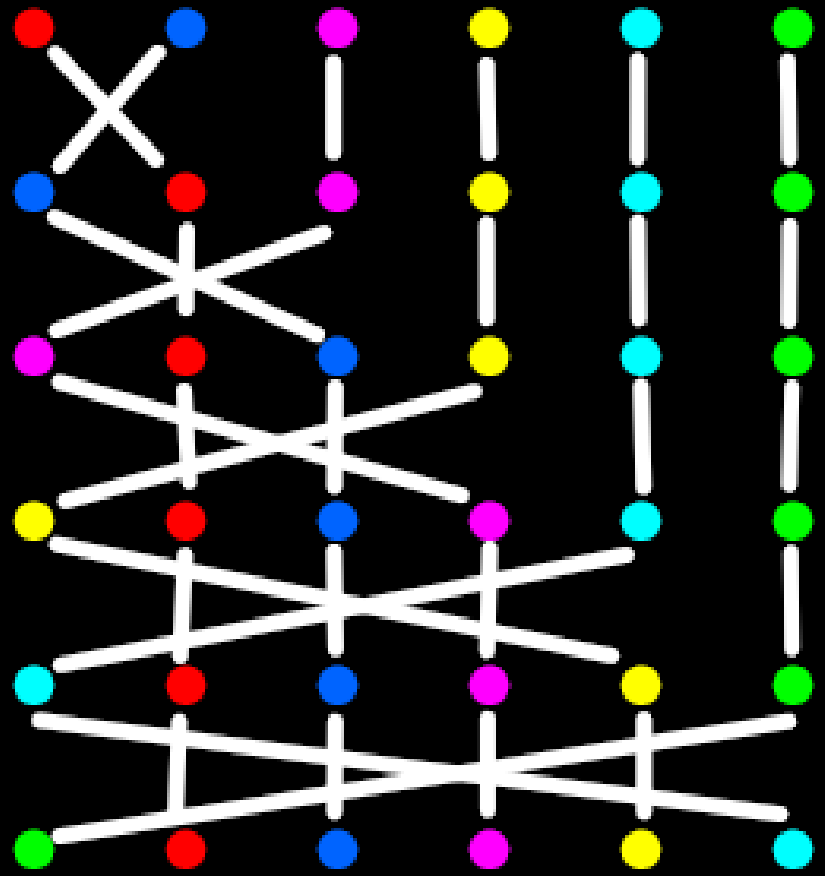


6 x 6



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# 7 x 7

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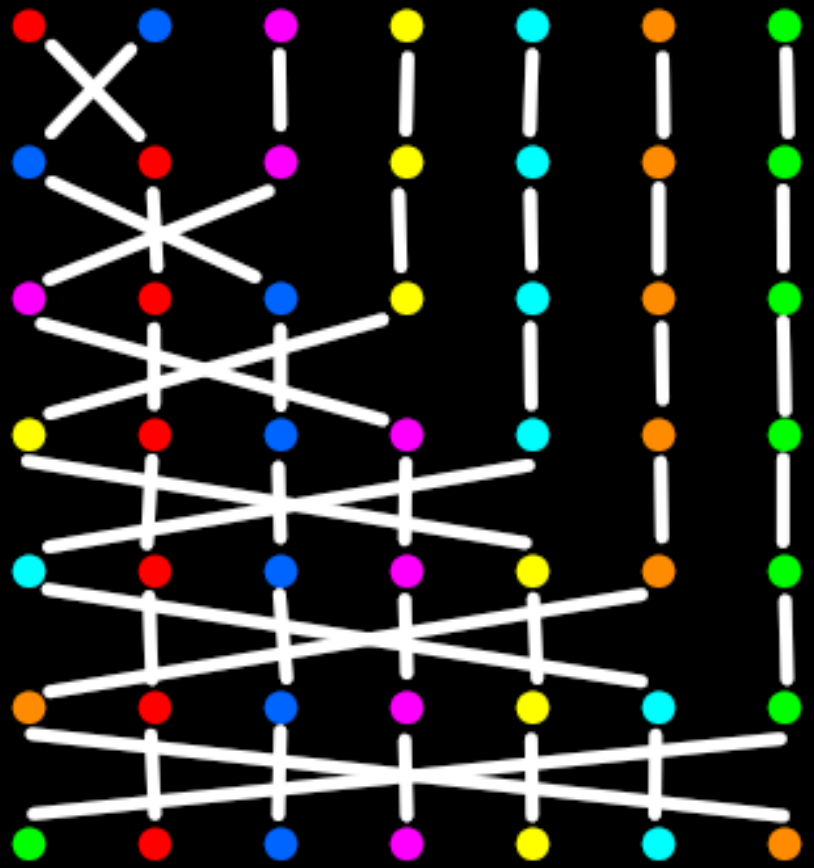

# 8 x 8

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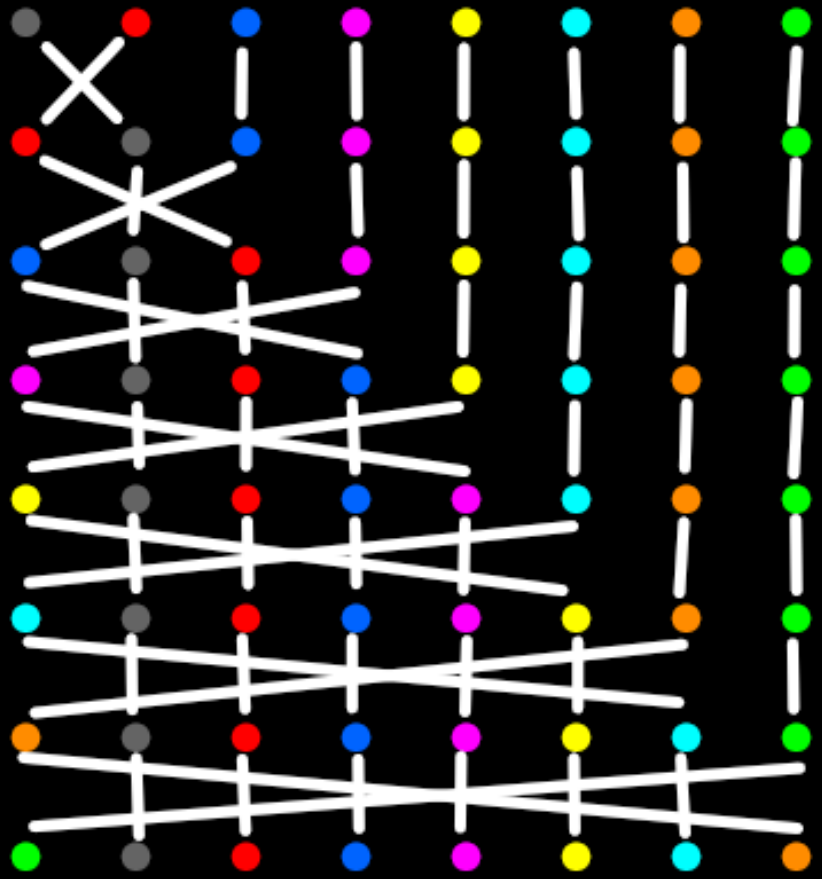

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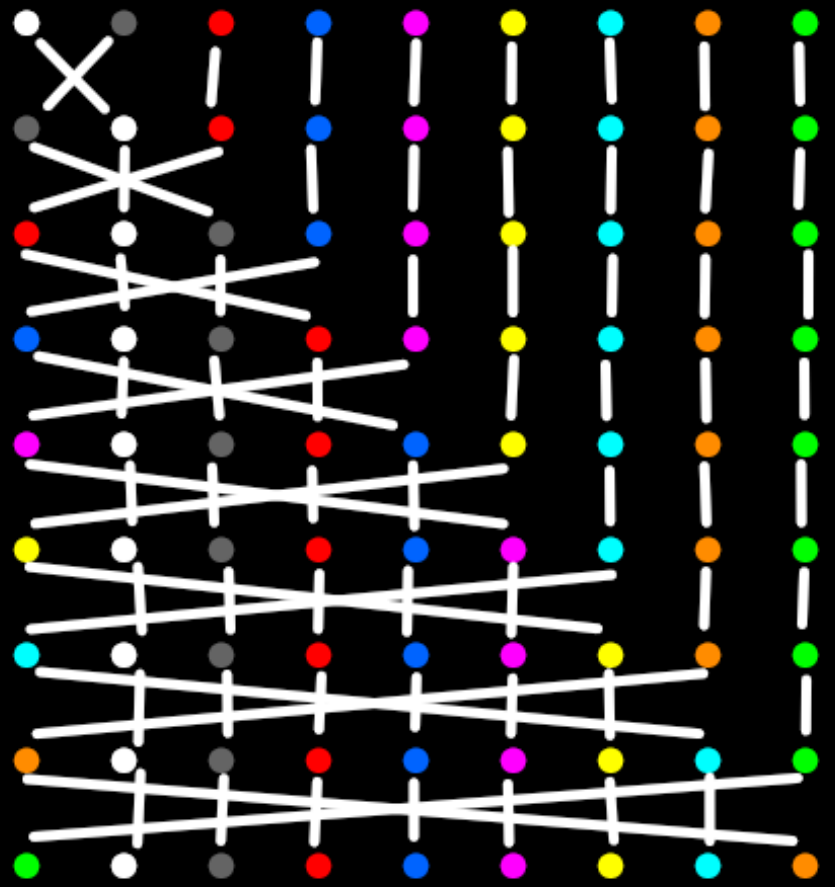
9 x 9



# berkeDet

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https://detsignper.org

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