Algorithmique Répartie

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Motivations :

Related work :

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- Global-Strong Multiplicity Detection

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- Global-Strong Multiplicity Detection
- Local-Strong and Global-Weak Multiplicity Detection

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ASYNC Asynchronous - The robots are activated/executed asynchronously

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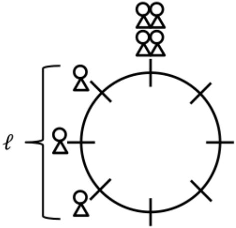

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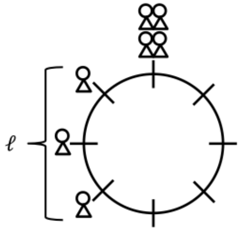

Set formation problem : The goal of the set formation problem is to gather the robots in a specific predefined configuration.

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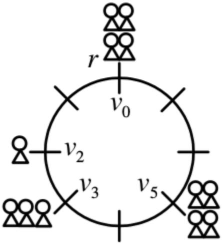

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- **Take care !** The scheduler is an enemy and will activate the robots in the worst way.

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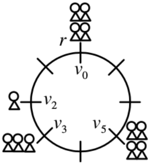
- **The scheduler is an enemy !**
- Less than M(C) nodes should move in the same direction !

Case 2 There are multiple such nodes :



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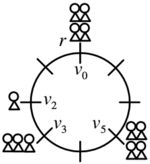

Take h_{min} the minimal distance between a M(C)-robot node and a neighboring robot node. Take V the set of nodes at distance h_{min} of a M(C)-node and R the robots on these nodes.

Cas 2.1 $|R| = 1$ - This robot gets to his closer M(C)-robot node.

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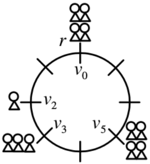

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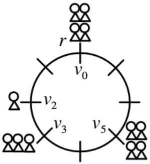

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Complexity : $O(n \log k)$ rounds and $O(kn)$ moves.

We can now apply the two previous algorithms to solve the **set formation problem**.

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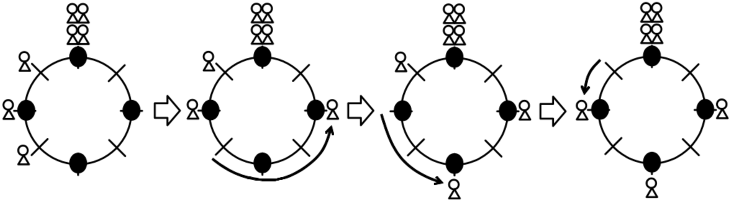

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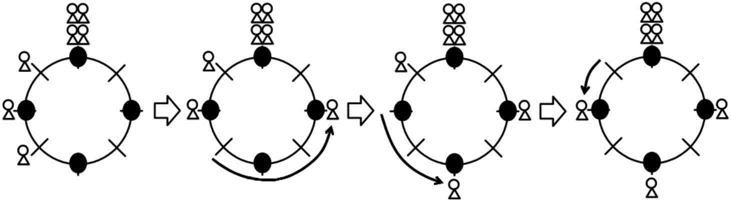

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- Our strong assumptions on the system are mandatory
- Solving the gathering and orientation issues is very important and leads to tons of other problems solved

In order to go further we could :

- Find the problems we can solve with weaker hypotheses,
- Work with a weaker scheduler, like an oblivious one,
- Work with a more complex graph than a ring.