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*Added all given constraints as a clauses into Z3 SMT solver.

* TimeStep L was keep incremented from 1 till SAT is achieved.

* Once it becomes SAT then ran solver with clause: And(newcost < oldcost), repeated until UNSAT, cost of last SAT solution is the minimum cost.

jupyter part2 Last Checkpoint: 2 minutes ago (unsaved changes)

File Edit View Insert Cell Kernel Widgets Help

Run Code

```
UNSAT at Time step L: 1
UNSAT at Time step L: 2
UNSAT at Time step L: 3
UNSAT at Time step L: 4
UNSAT at Time step L: 5

SAT at Time step L: 6
Note: Each row represent Timestep: L and each column represent a robot Ri

|-----Motion matrix of robots-----|
     R0      R1      R2      R3
[[[0, 0], [0, 1], [1, 0], [1, 1]],
 [[0, 0], [0, 2], [2, 1], [2, 2]],
 [[0, 0], [0, 3], [3, 1], [2, 3]],
 [[0, 0], [0, 3], [4, 2], [3, 4]],
 [[0, 0], [1, 3], [4, 2], [3, 3]],
 [[0, 0], [1, 3], [4, 1], [4, 3]],
 [[0, 0], [0, 4], [4, 0], [4, 4]]]

|---Cost matrix of robots---|
  R0   R1   R2   R3
[[1/2, 1, 3/2, 3/2],
 [1/2, 1, 1, 1],
 [1/2, 1/2, 3/2, 3/2],
 [1/2, 1, 1/2, 1],
 [1/2, 1/2, 1, 1],
 [1/2, 3/2, 1, 1]]

Initial positions of Robots are R0:(0,0), R1:(0,1), R2:(1,0), R3:(1,1)
Final positions of Robots are   R0:(0,0), R1:(0,4), R2:(4,0), R3:(4,4)

Minimum cost for Robot:0 : 3.0
Minimum cost for Robot:1 : 5.5
Minimum cost for Robot:2 : 6.5
Minimum cost for Robot:3 : 7.0
Total Minimum cost : 22.0
```

Fig 3: Snapshot of the execution of SMT solver.

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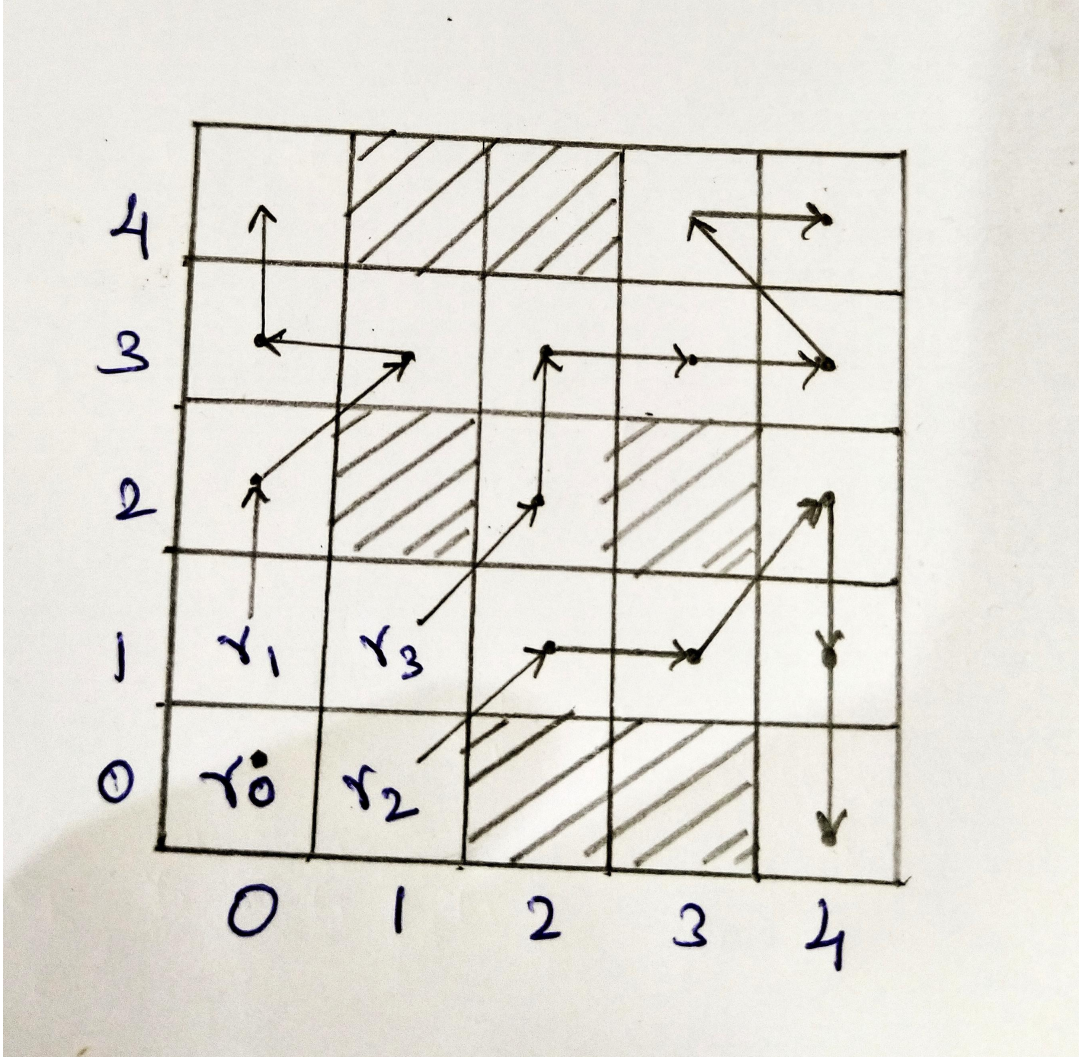

Fig 4: Trajectories synthesized from the solution obtained from SMT solver.