Assignment-4

2023-02-06

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There was some confusion in the terminology of using 20% probability of moving +/-45degrees from the commanded move. One interpretation was that it was moving 10% in + 45, and 10% in -45degrees from the commanded move. The other interpretation was that the robot would move 20% in + 45, and 20% in -45degrees from the commanded move.
As a result both these cases were considered. The former was labelled as stochastic, the second is labelled as stochastic 2.
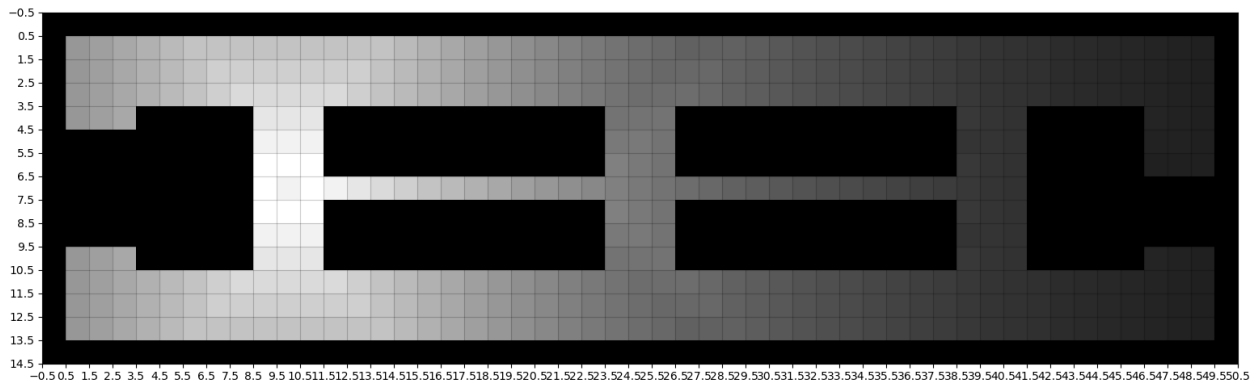
The time reported is the time taken from the beginning of the iteration loops till optimal policy is found.

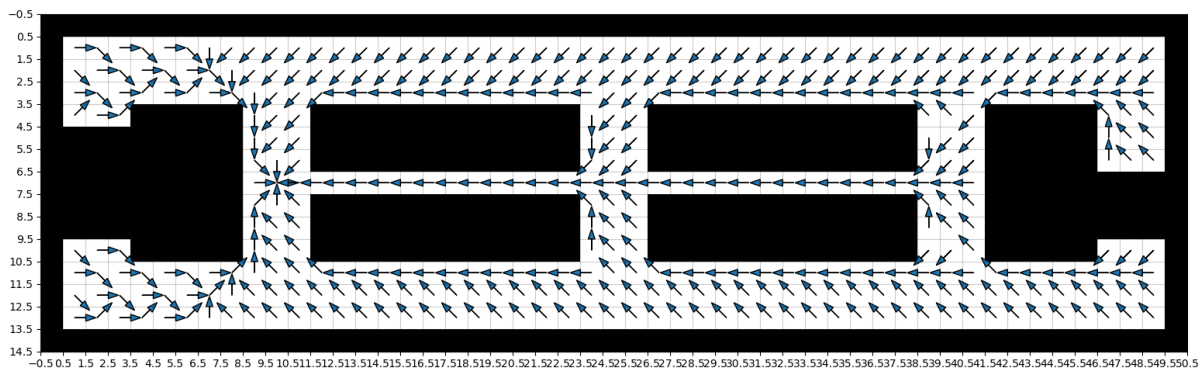The value and policy maps are reported below-

Policy iteration:

Deterministic:

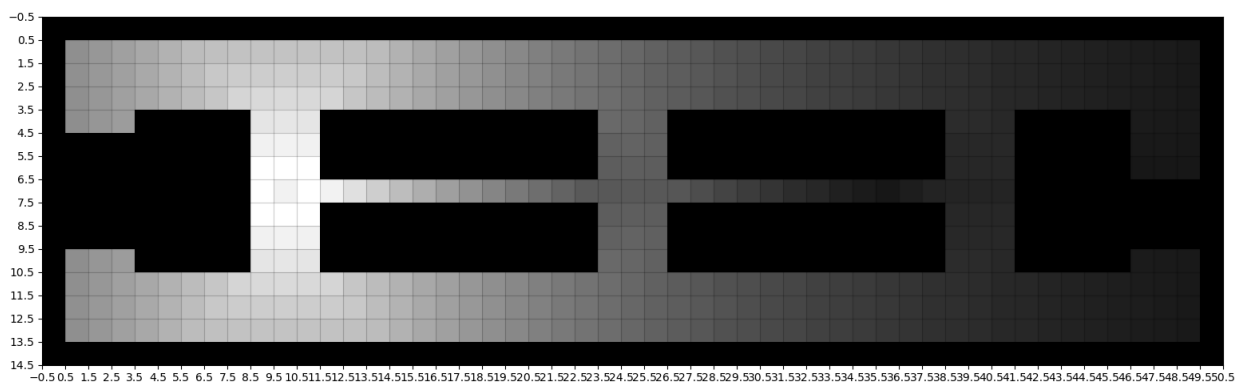Value map:

Policy map:

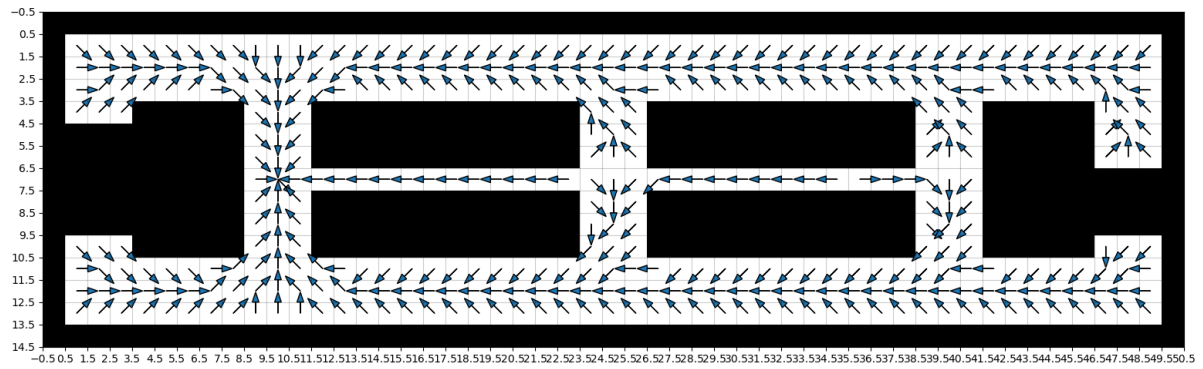Time taken to converge and find the optimal solution:
22.98717519999991 seconds

Stochastic:
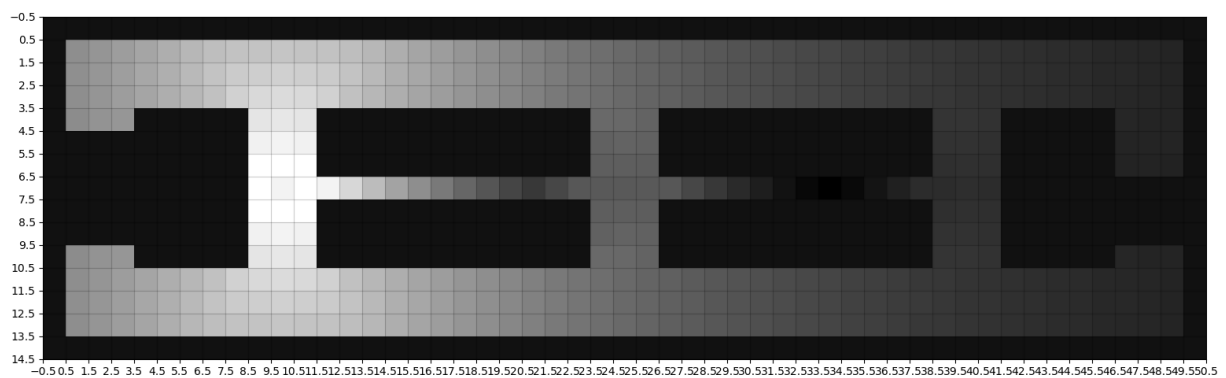
Value map:

Policy map:

Time taken to converge and find the optimal solution:
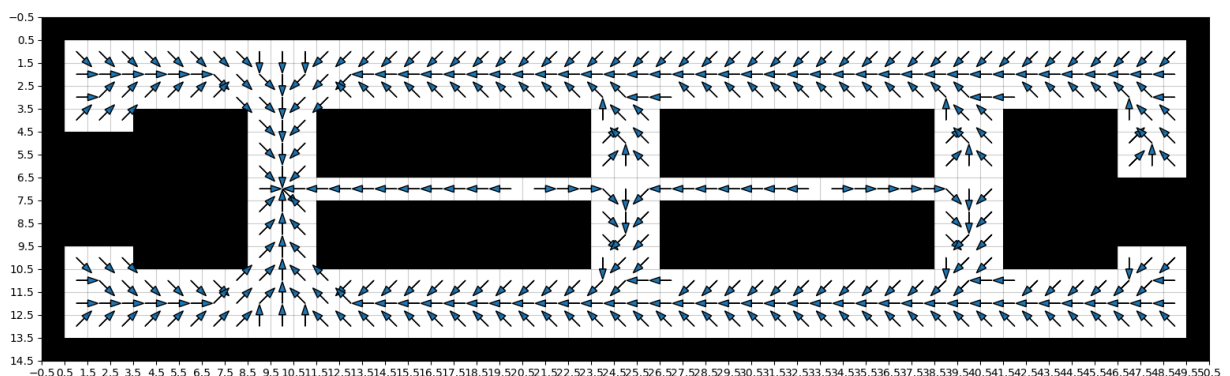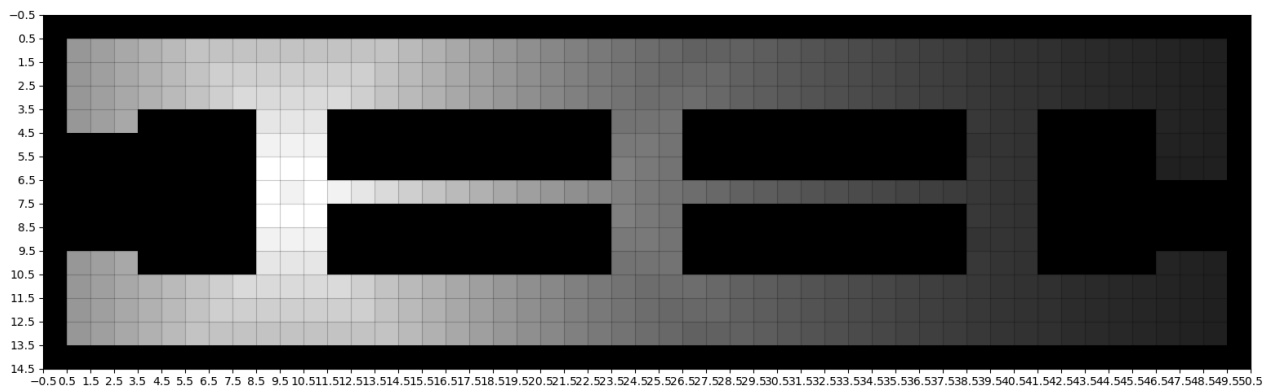28.08085569999821 seconds

Stochastic2:

Value map:

Policy map:

Time taken to converge and find the optimal solution:
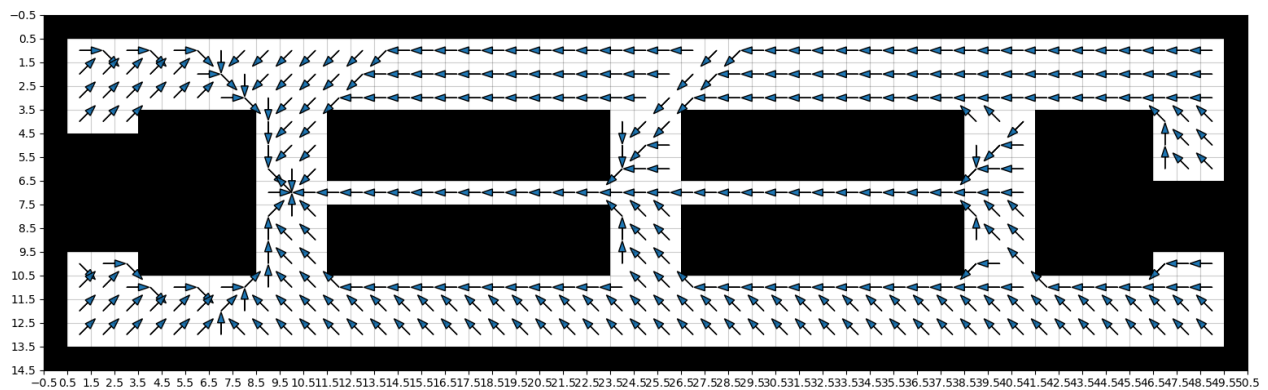27.102159900001425 seconds

Value iteration:

Deterministic:

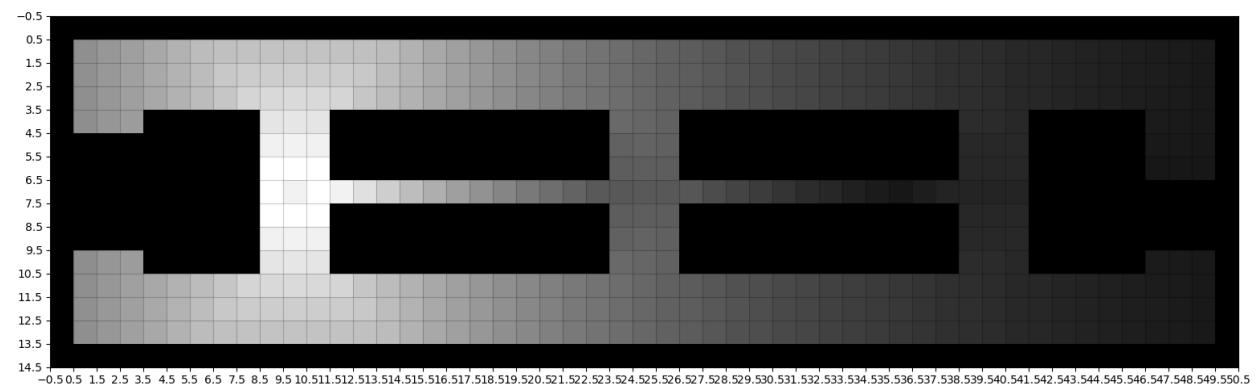### Value map:

Policy map:

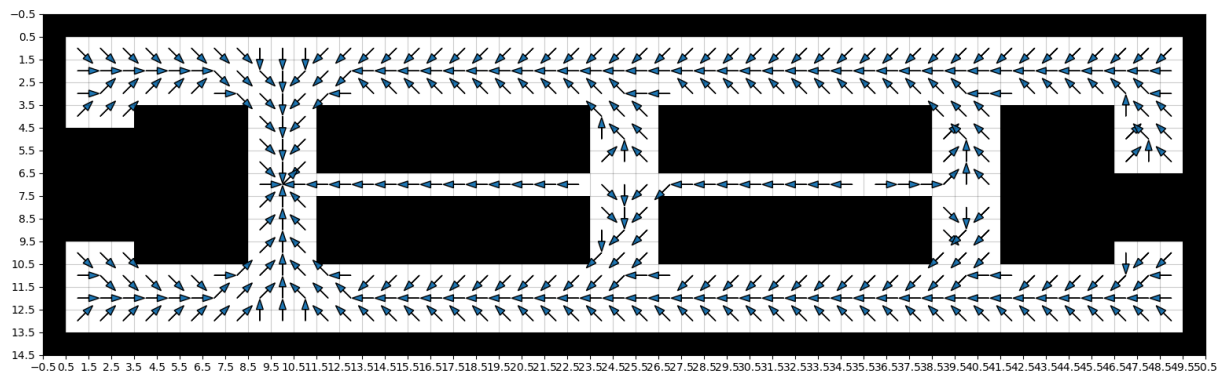Time taken to converge and find the optimal solution:
4.151322199999413 seconds

Stochastic:
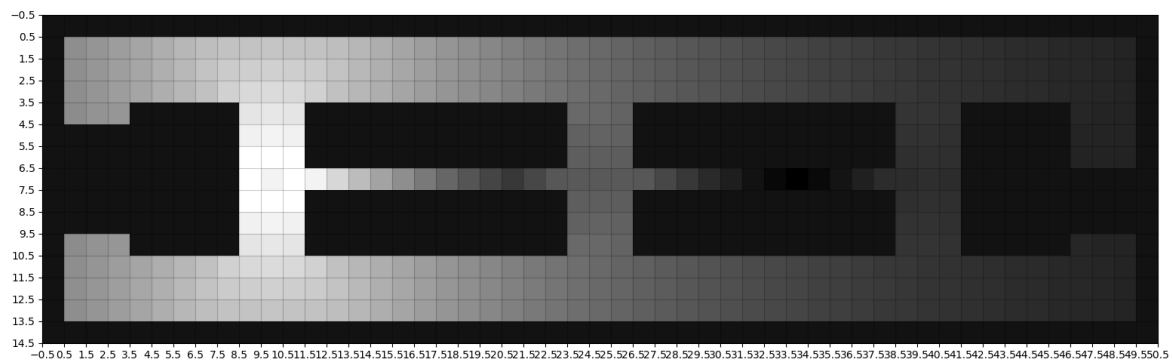
Value map:

Policy map:

Time taken to converge and find the optimal solution:
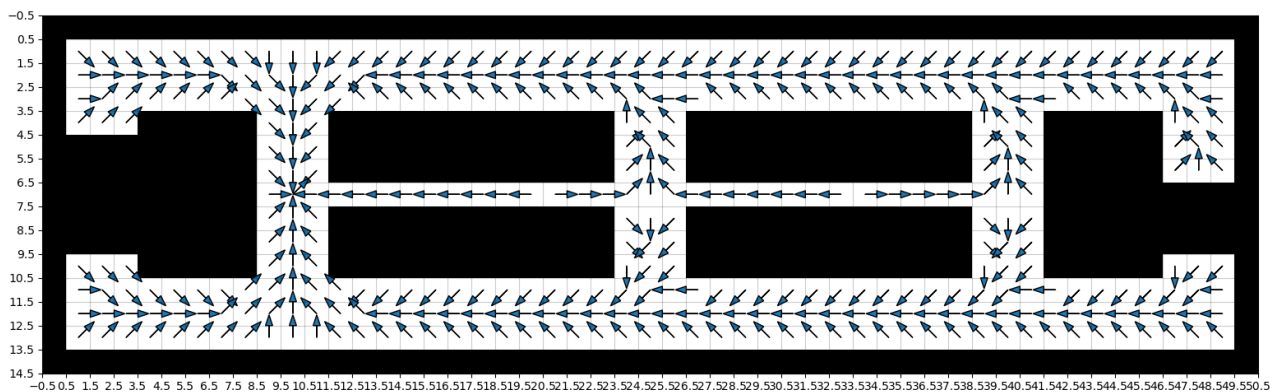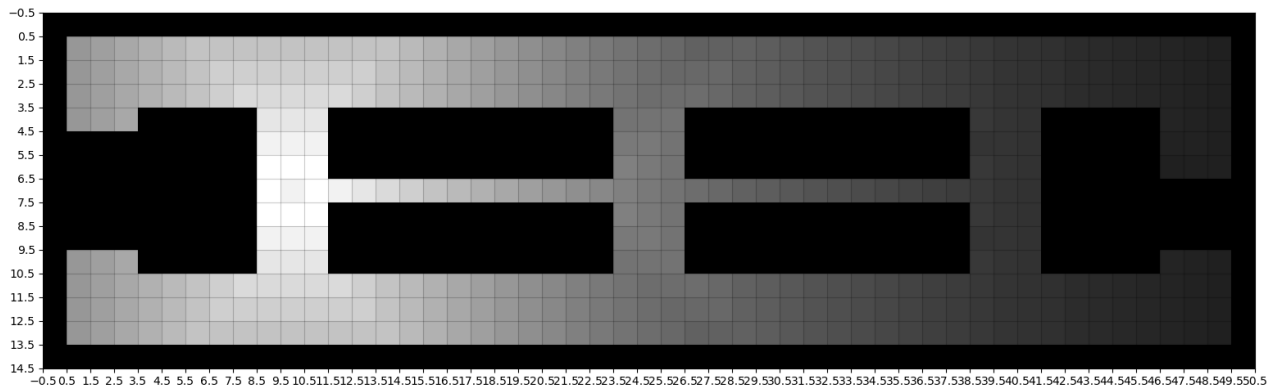4.080774999998539 seconds

Stochastic2:

Value map:

Policy map:

Time taken to converge and find the optimal solution:
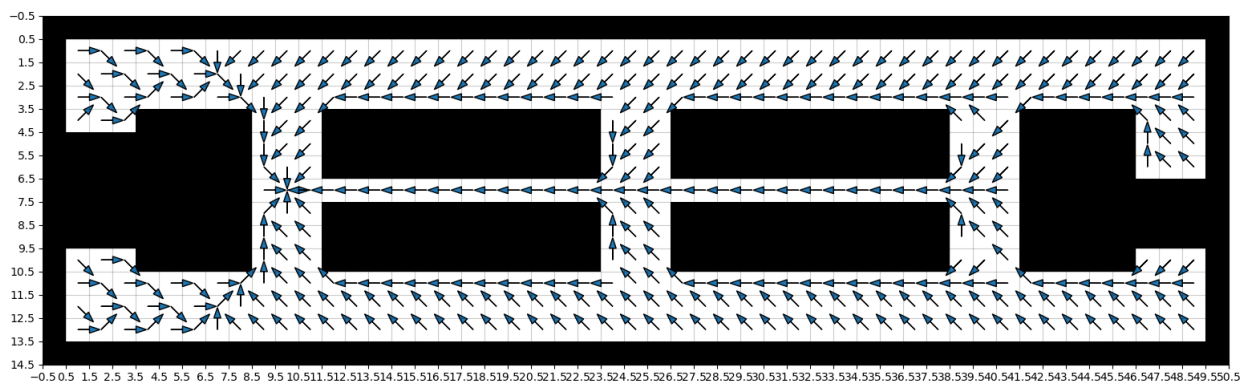3.9752389999994193 seconds

Generalized policy iteration:

Deterministic:
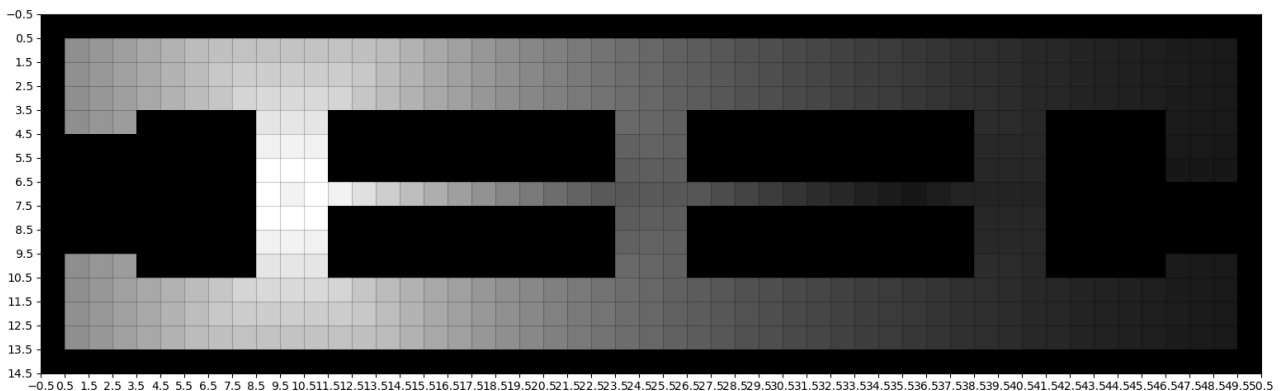
Value map

Policy map:

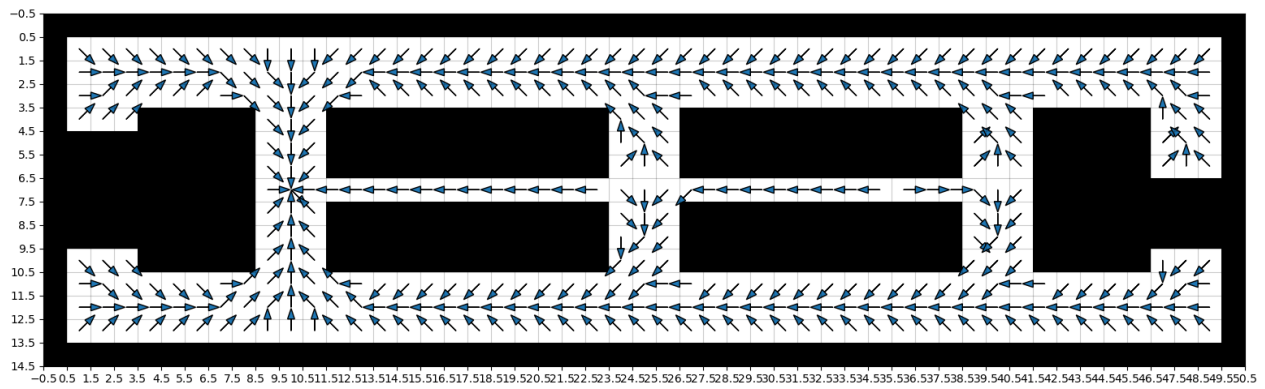Time taken to converge and find the optimal solution:
10.189855499997066 seconds

Stochastic:

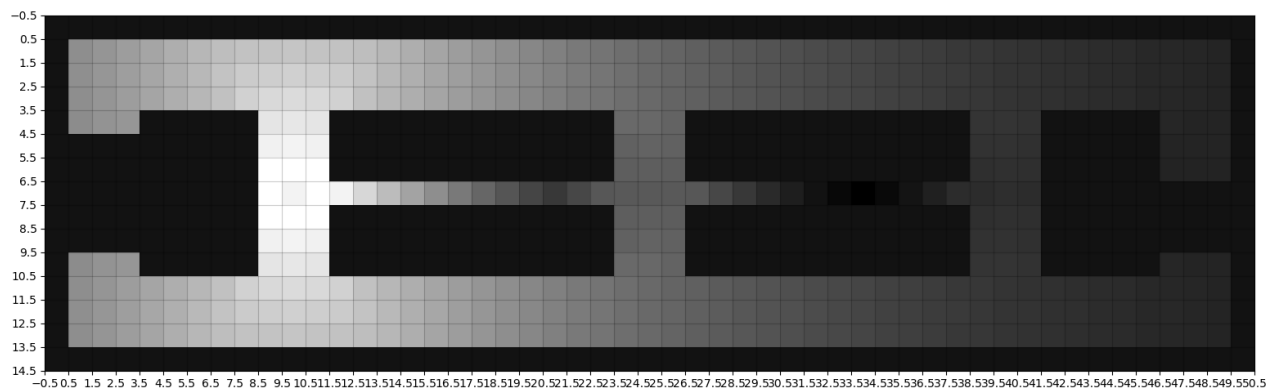### Value map:

Policy map:

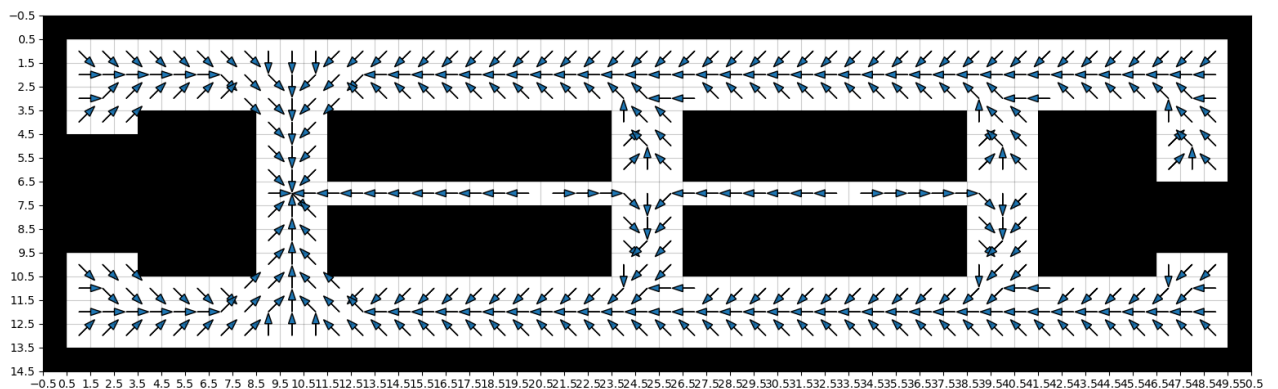Time taken to converge and find the optimal solution:
9.691166799999337 seconds

Stochastic2:

Value map

Policy map:

Time taken to converge and find the optimal solution:
9.665344900000491 seconds