Project Milestone 4 Results

AASISH TAMMANA

1225545568

atammana@asu.edu

Instance File 1(inst1.asp):

Clingo command executed:

clingo aasish_warehouse.lp inst1.asp -c n=10

Result obtained:

(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp inst1.asp -c n=10

clingo version 5.4.0

Reading from aasish_warehouse.lp ...

Solving...

Answer: 1

occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(1,0),1) occurs(object(robot,2),move(0,-1),2) occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),move(0,1),5) occurs(object(robot,1),move(0,-1),6) occurs(object(robot,2),move(0,-1),7) occurs(object(robot,1),move(0,1),8) occurs(object(robot,2),pickup,0) occurs(object(robot,1),pickup,2) occurs(object(robot,2),pickup,6) occurs(object(robot,1),pickup,7) occurs(object(robot,2),putdown,4) occurs(object(robot,1),putdown,5) occurs(object(robot,2),deliver(2,2,1),3) occurs(object(robot,1),deliver(1,1,1),4) occurs(object(robot,2),deliver(3,4,1),8) occurs(object(robot,1),deliver(1,3,4),9) timeTaken(9) numActions(19)

Optimization: 64

OPTIMUM FOUND

Models   : 1

 Optimum   : yes

Optimization : 64

Calls   : 1

Time   : 0.701s (Solving: 0.39s 1st Model: 0.25s Unsat: 0.14s)

CPU Time   : 0.266s

```
(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp
inst1.asp -c n=10
clingo version 5.4.0
Reading from aasish_warehouse.lp ...
Solving...
Answer: 1
occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(1,0),1) occurs(ob
ject(robot,2),move(0,-1),2) occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),move(0,1),5) occurs(object(robo
t,1),move(0,-1),6) occurs(object(robot,2),move(0,-1),7) occurs(object(robot,1),move(0,1),8) occurs(object(robot,2),pick
up,0) occurs(object(robot,1),pickup,2) occurs(object(robot,2),pickup,6) occurs(object(robot,1),pickup,7) occurs(object(
robot,2),putdown,4) occurs(object(robot,1),putdown,5) occurs(object(robot,2),deliver(2,2,1),3) occurs(object(robot,1),d
eliver(1,1,1),4) occurs(object(robot,2),deliver(3,4,1),8) occurs(object(robot,1),deliver(1,3,4),9) timeTaken(9) numActi
ons(19)
Optimization: 64
OPTIMUM FOUND

Models     : 1
  Optimum   : yes
Optimization : 64
Calls      : 1
Time       : 0.602s (Solving: 0.36s 1st Model: 0.23s Unsat: 0.13s)
CPU Time   : 0.063s
```

Instance File 2(inst2.asp):

Clingo command executed:

clingo aasish_warehouse.lp inst2.asp -c n=11

Result obtained:

(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp inst2.asp -c n=11

clingo version 5.4.0

Reading from aasish_warehouse.lp ...

Solving...

Answer: 1

occurs(object(robot,1),move(0,-1),0) occurs(object(robot,2),move(0,1),0) occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(-1,0),2) occurs(object(robot,1),move(0,1),5) occurs(object(robot,2),move(1,0),5) occurs(object(robot,2),move(0,-1),6) occurs(object(robot,1),move(-1,0),7) occurs(object(robot,1),move(-1,0),8) occurs(object(robot,2),move(1,0),8) occurs(object(robot,2),move(0,-1),9) occurs(object(robot,2),pickup,1) occurs(object(robot,1),pickup,3) occurs(object(robot,2),pickup,7) occurs(object(robot,2),putdown,4) occurs(object(robot,2),deliver(1,1,1),3) occurs(object(robot,1),deliver(1,3,1),9) occurs(object(robot,1),deliver(1,3,1),10) occurs(object(robot,2),deliver(2,2,1),10) timeTaken(10) numActions(19)

Optimization: 74

Answer: 2

occurs(object(robot,1),move(-1,0),0) occurs(object(robot,2),move(0,1),0)
occurs(object(robot,1),move(0,-1),1) occurs(object(robot,2),move(-1,0),2)
occurs(object(robot,2),move(1,0),5) occurs(object(robot,2),move(0,-1),6)
occurs(object(robot,1),move(0,1),7) occurs(object(robot,1),move(-1,0),8)
occurs(object(robot,2),move(0,-1),8) occurs(object(robot,1),move(-1,0),9)
occurs(object(robot,2),move(1,0),9) occurs(object(robot,2),pickup,1)
occurs(object(robot,1),pickup,3) occurs(object(robot,2),pickup,7) occurs(object(robot,2),putdown,4)
occurs(object(robot,2),deliver(1,1,1),3) occurs(object(robot,1),deliver(1,3,2),10)
occurs(object(robot,2),deliver(2,2,1),10) timeTaken(10) numActions(18)

Optimization: 73

Answer: 3

occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(0,-1),1)
occurs(object(robot,1),move(-1,0),2) occurs(object(robot,2),move(1,0),2)
occurs(object(robot,1),move(-1,0),4) occurs(object(robot,2),move(0,1),5)
occurs(object(robot,1),move(1,0),6) occurs(object(robot,2),move(-1,0),7)
occurs(object(robot,2),move(-1,0),8) occurs(object(robot,2),move(0,1),9)
occurs(object(robot,2),pickup,0) occurs(object(robot,1),pickup,3) occurs(object(robot,2),pickup,6)
occurs(object(robot,2),putdown,4) occurs(object(robot,2),deliver(2,2,1),3)
occurs(object(robot,1),deliver(1,1,1),5) occurs(object(robot,2),deliver(1,3,2),10) timeTaken(10)
numActions(17)

Optimization: 72

OPTIMUM FOUND

Models   : 3

  Optimum   : yes

Optimization : 72

Calls   : 1

Time   : 0.623s (Solving: 0.46s 1st Model: 0.03s Unsat: 0.30s)

CPU Time   : 0.438s

```
Answer: 3
occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(0,-1),1) occurs(object(robot,1),move(-1,0),2) occurs(o
bject(robot,2),move(1,0),2) occurs(object(robot,1),move(-1,0),4) occurs(object(robot,2),move(0,1),5) occurs(object(robo
t,1),move(1,0),6) occurs(object(robot,2),move(-1,0),7) occurs(object(robot,2),move(-1,0),8) occurs(object(robot,2),move
(0,1),9) occurs(object(robot,2),pickup,0) occurs(object(robot,1),pickup,3) occurs(object(robot,2),pickup,6) occurs(obje
ct(robot,2),putdown,4) occurs(object(robot,2),deliver(2,2,1),3) occurs(object(robot,1),deliver(1,1,1),5) occurs(object(
robot,2),deliver(1,3,2),10) timeTaken(10) numActions(17)
Optimization: 72
OPTIMUM FOUND

Models      : 3
  Optimum   : yes
Optimization : 72
Calls       : 1
Time        : 0.601s (Solving: 0.44s 1st Model: 0.03s Unsat: 0.31s)
CPU Time    : 0.047s

(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>
```

Instance File 3(inst3.asp):

Clingo command executed:

clingo aasish_warehouse.lp inst3.asp -c n=7

Result obtained:

(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp inst3.asp -c n=7

clingo version 5.4.0

Reading from aasish_warehouse.lp ...

Solving...

Answer: 1

occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(0,-1),1)
occurs(object(robot,1),move(0,-1),3) occurs(object(robot,2),move(0,-1),3)
occurs(object(robot,1),move(0,1),5) occurs(object(robot,2),move(1,0),5)
occurs(object(robot,1),pickup,2) occurs(object(robot,2),pickup,2)
occurs(object(robot,1),deliver(2,4,1),4) occurs(object(robot,2),deliver(1,2,1),6) timeTaken(6)
numActions(10)

Optimization: 31

OPTIMUM FOUND

Models   : 1

  Optimum   : yes

Optimization : 31

Calls   : 1

Time   : 0.087s (Solving: 0.03s 1st Model: 0.03s Unsat: 0.00s)

CPU Time   : 0.031s

```
(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp
inst3.asp -c n=7
clingo version 5.4.0
Reading from aasish_warehouse.lp ...
Solving...
Answer: 1
occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(0,-1),1) occurs(object(robot,1),move(0,-1),3) occurs(o
bject(robot,2),move(0,-1),3) occurs(object(robot,1),move(0,1),5) occurs(object(robot,2),move(1,0),5) occurs(object(robo
t,1),pickup,2) occurs(object(robot,2),pickup,2) occurs(object(robot,1),deliver(2,4,1),4) occurs(object(robot,2),deliver
(1,2,1),6) timeTaken(6) numActions(10)
Optimization: 31
OPTIMUM FOUND

Models        : 1
  Optimum    : yes
Optimization : 31
Calls        : 1
Time         : 0.108s (Solving: 0.02s 1st Model: 0.02s Unsat: 0.01s)
CPU Time     : 0.000s
```

Instance File 4(inst4.asp):

Clingo command executed:

clingo aasish_warehouse.lp inst4.asp -c n=5

Result obtained:

(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp inst4.asp -c n=5

clingo version 5.4.0

Reading from aasish_warehouse.lp ...

Solving...

Answer: 1

occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(1,0),1) occurs(object(robot,2),move(0,-1),2) occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),pickup,0) occurs(object(robot,1),pickup,2) occurs(object(robot,2),deliver(3,2,2),3) occurs(object(robot,2),deliver(2,2,1),4) occurs(object(robot,1),deliver(1,1,1),4) timeTaken(4) numActions(10)

Optimization: 20

OPTIMUM FOUND

Models   : 1

  Optimum   : yes

Optimization : 20

Calls   : 1

Time   : 0.126s (Solving: 0.00s 1st Model: 0.00s Unsat: 0.00s)

```
(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp
inst4.asp -c n=5
clingo version 5.4.0
Reading from aasish_warehouse.lp ...
Solving...
Answer: 1
occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(-1,0),1) occurs(object(robot,2),move(1,0),1) occurs(ob
ject(robot,2),move(0,-1),2) occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),pickup,0) occurs(object(robot,1
),pickup,2) occurs(object(robot,2),deliver(3,2,2),3) occurs(object(robot,2),deliver(2,2,1),4) occurs(object(robot,1),de
liver(1,1,1),4) timeTaken(4) numActions(10)
Optimization: 20
OPTIMUM FOUND

Models      : 1
  Optimum    : yes
Optimization : 20
Calls       : 1
Time        : 0.061s (Solving: 0.00s 1st Model: 0.00s Unsat: 0.00s)
CPU Time    : 0.016s
```

Instance File 5(inst5.asp):

Clingo command executed:

clingo aasish_warehouse.lp inst5.asp -c n=7

Result obtained:

(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp inst5.asp -c n=7

clingo version 5.4.0

Reading from aasish_warehouse.lp ...

Solving...

Answer: 1

occurs(object(robot,1),move(0,-1),0) occurs(object(robot,2),move(0,1),0)
occurs(object(robot,1),move(-1,0),1) occurs(object(robot,1),move(-1,0),2)
occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),move(-1,0),3)
occurs(object(robot,1),move(0,1),5) occurs(object(robot,2),move(0,1),5)
occurs(object(robot,2),pickup,2) occurs(object(robot,1),pickup,4)
occurs(object(robot,2),deliver(1,1,1),4) occurs(object(robot,1),deliver(1,3,4),6) timeTaken(6)
numActions(12)

Optimization: 33

Answer: 2

occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(-1,0),1)
occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),move(-1,0),3)
occurs(object(robot,1),move(1,0),5) occurs(object(robot,2),move(0,1),5)
occurs(object(robot,1),pickup,2) occurs(object(robot,2),pickup,4)
occurs(object(robot,1),deliver(1,1,1),4) occurs(object(robot,2),deliver(1,3,4),6) timeTaken(6)
numActions(10)

Optimization: 31

OPTIMUM FOUND

Models   : 2

 Optimum   : yes

Optimization : 31

Calls   : 1

Time   : 0.128s (Solving: 0.03s 1st Model: 0.01s Unsat: 0.01s)

CPU Time   : 0.016s

```
(cse579) C:\Users\Aasish\Desktop\ASU\CSE 579 - Knowledge Representation\Project Milestone 4>clingo aasish_warehouse.lp
inst5.asp -c n=7
clingo version 5.4.0
Reading from aasish_warehouse.lp ...
Solving...
Answer: 1
occurs(object(robot,1),move(0,-1),0) occurs(object(robot,2),move(0,1),0) occurs(object(robot,1),move(-1,0),1) occurs(ob
ject(robot,1),move(-1,0),2) occurs(object(robot,1),move(-1,0),3) occurs(object(robot,2),move(-1,0),3) occurs(object(rob
ot,1),move(0,1),5) occurs(object(robot,2),move(0,1),5) occurs(object(robot,2),pickup,2) occurs(object(robot,1),pickup,4
) occurs(object(robot,2),deliver(1,1,1),4) occurs(object(robot,1),deliver(1,3,4),6) timeTaken(6) numActions(12)
Optimization: 33
Answer: 2
occurs(object(robot,1),move(-1,0),0) occurs(object(robot,1),move(-1,0),1) occurs(object(robot,1),move(-1,0),3) occurs(o
bject(robot,2),move(-1,0),3) occurs(object(robot,1),move(1,0),5) occurs(object(robot,2),move(0,1),5) occurs(object(robo
t,1),pickup,2) occurs(object(robot,2),pickup,4) occurs(object(robot,1),deliver(1,1,1),4) occurs(object(robot,2),deliver
(1,3,4),6) timeTaken(6) numActions(10)
Optimization: 31
OPTIMUM FOUND

Models      : 2
  Optimum   : yes
Optimization : 31
Calls       : 1
Time        : 0.128s (Solving: 0.03s 1st Model: 0.01s Unsat: 0.01s)
CPU Time    : 0.016s
```