

COS30002

Lab Report – Task 6 (28/3/2021)

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- Looked at Towers of Hanoi code
- Modified sequence of moves in the code
- Enabled random search
- Implemented random selection using Sample
- Implemented pointless move avoidance
- Looked at water Jugs code
- Fixed tests
- Solved sequence 1
- Solved sequence 2
- Tested Water Jugs random search
- Implemented better random search
- Set all goals
- Added pointless move avoidance

```
.(0, 3) fill [0] on (0, 3) => (5, 3)
.(5, 3) empty [1] on (5, 3) => (5, 0)
.(5, 0) pour [0, 1] on (5, 0) => (2, 3)
.(2, 3) fill [0] on (2, 3) => (5, 3)
.(5, 3) empty [1] on (5, 3) => (5, 0)
.(5, 0) pour [0, 1] on (5, 0) => (2, 3)
.(2, 3) empty [1] on (2, 3) => (2, 0)
.(2, 0) pour [0, 1] on (2, 0) => (0, 2)
.(0, 2) fill [0] on (0, 2) => (5, 2)
.(5, 2) pour [1, 0] on (5, 2) => (5, 2)
.(5, 2) pour [0, 1] on (5, 2) => (4, 3)
.(4, 3)
Result: Success (limit=4000, count=2722, history=1236)
```

Logs:

1st time:

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 50

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 42

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 42

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 57

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 94

[(0, 1), (1, 2), (2, 1), (0, 2), (1, 0), (0, 1), (1, 2), (2, 1), (1, 0), (0, 2), (2, 0), (0, 1), (1, 2), (2, 1), (2, 0), (0, 2), (2, 0), (1, 2), (2, 0), (0, 1), (1, 2), (2, 0), (0, 1), (1, 2), (2, 1), (0, 2), (1, 2), (2, 1), (0, 2), (1, 2), (2, 0), (0, 2), (0, 1), (1, 0), (0, 1), (2, 1), (1, 0), (0, 1), (0, 2), (1, 0), (0, 2), (2, 0), (0, 1), (1, 0), (1, 2), (0, 2)]

Moves (valid and kept): 46

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 98

[(0, 2), (2, 0), (0, 2), (0, 1), (2, 1), (1, 0), (1, 2), (0, 2), (0, 1), (2, 0), (0, 2), (2, 0), (0, 2), (1, 0), (0, 1), (1, 0), (0, 1), (1, 0), (2, 1), (2, 0), (1, 2), (2, 1), (0, 2), (1, 0), (0, 1), (1, 0), (2, 1), (0, 2), (2, 1), (1, 0), (0, 1), (1, 2), (1, 0), (0, 1), (2, 1), (0, 2), (1, 0), (1, 2), (0, 2)]

Moves (valid and kept): 39

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 48

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 57

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 42

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 53

Done.

2nd time:

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 87

[(0, 1), (0, 2), (1, 0), (2, 1), (0, 1), (1, 2), (1, 0), (2, 0), (0, 1), (0, 2), (1, 2), (0, 1), (2, 0), (0, 1), (1, 2), (2, 0), (2, 1), (0, 2), (1, 0), (2, 0), (1, 2), (0, 2),

(2, 1), (0, 2), (1, 2)]

Moves (valid and kept): 25

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 40

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 55

[(0, 2), (2, 1), (0, 2), (1, 0), (2, 1), (0, 2), (2, 1), (1, 0), (1, 2), (0, 1), (1, 2), (2, 0), (2, 1), (0, 1), (0, 2), (1, 2), (2, 0), (0, 1), (1, 2), (2, 0), (1, 2), (0, 2),

Moves (valid and kept): 22

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 71

[(0, 2), (2, 1), (0, 2), (1, 2), (2, 0), (0, 1), (1, 2), (2, 0), (0, 1), (1, 2), (0, 1), (2, 0), (0, 1), (1, 2), (2, 0), (0, 1), (2, 0), (1, 2), (2, 0), (1, 2), (0, 1), (0, 2),

(1, 0), (0, 2)]

Moves (valid and kept): 24

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 27

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 26

[(0, 2), (0, 1), (2, 1), (0, 2), (1, 0), (1, 2), (0, 1), (1, 2)]

Moves (valid and kept): 8

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 97

[(0, 1), (0, 2), (1, 2), (2, 0), (0, 1), (1, 2), (2, 0), (0, 1), (2, 0), (1, 0), (0, 2), (0, 1), (2, 1), (0, 2), (1, 0), (1, 2), (0, 1), (2, 0), (1, 0), (2, 1), (0, 2), (0, 1),

(2, 1), (1, 0), (1, 2), (0, 2), (2, 1), (2, 0), (1, 0), (1, 2), (0, 2), (2, 1), (1, 0), (0, 2), (2, 1), (1, 0), (0, 2), (0, 1), (2, 0), (1, 2), (0, 2)]

Moves (valid and kept): 41

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 33

[(0, 1), (0, 2), (1, 0), (0, 2), (2, 1), (1, 0), (2, 1), (0, 2), (2, 1), (0, 2), (1, 0), (1, 2), (0, 1), (1, 2)]

Moves (valid and kept): 14

Done.

Guessing with n=3, limit=100 ...

Result: Found it!

Count (attempted random moves) 90

[(0, 2), (2, 1), (1, 0), (0, 2), (0, 1), (2, 1), (1, 0), (0, 2), (2, 1), (0, 2), (1, 2), (2, 0), (0, 1), (1, 2), (1, 0), (2, 0), (2, 1), (0, 1), (0, 2), (1, 2), (1, 0), (2, 0),

(2, 1), (0, 2), (2, 1), (0, 2), (1, 2), (1, 0), (2, 1), (1, 0), (0, 2), (0, 1), (2, 0), (1, 2), (0, 2)]

Moves (valid and kept): 35

Done.

Guessing with n=3, limit=100 ...

Result: Hit Limit. No solution.

Count (attempted random moves) 100

Moves (valid and kept): 27

Done.