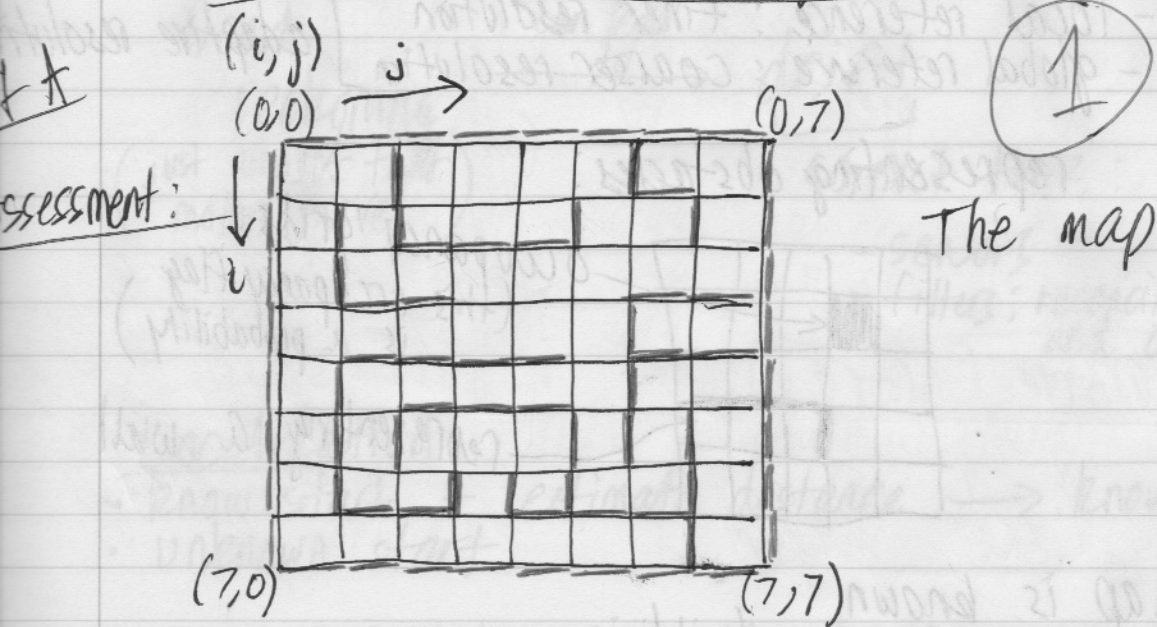- Not discrete state space
- probabilistic planners
  - ~~intro~~ introduce randomness
- graph-based planners

Starting Assignment #2: Localization and Planning 10/18/16

(i,j)

$(0,0)$ $j \longrightarrow$ $(0,7)$

$i \downarrow$

$(7,0)$ $(7,7)$

The map

①

Assessment: Walking 3 pairs of positions

$$x(0,0) \longrightarrow x(3,0)$$

Left: ||||

Right: ||

Left
Front
Right

$(0,1)$ ~~$(1,0)$~~

1: hard-coded map
2: localization (simple walks)
3: planning
4: mapping
5: mapping improvement
6: localization improvement

Part A, III

Planning Data Collection

③ 01

$$S1 \quad 2, 1, S$$
$$G \quad 6, 2, E$$

Run 1
center,
  straight ahead

Run 2
center, rotated heading
20° right
  to offset error

Time: 50.43 sec.
Final position: ~~(5,1)~~ (4,1)
Final heading: stuck left, headed south
Time: 1:04.19 sec.
Final position: 2 in. N, 0.5 in. E, (6,2)
Final heading: 7° left of E

02

$$S1 \quad 7, 6, W$$
$$G \quad 4, 7, E$$

Run 1
center, straight
ahead

Time: 44.94
Pos: 1⅛ ~~in~~ in. E, ~~2⅞~~ 2.75 in. S, (4,7)
Head.: 5° right of E

03

$$S1 \quad 7, 2, N$$
$$G \quad 0, 3, W$$

Run 1
center,
straight
ahead

Time: 46.21
Pos.: hit W wall at (0,0)
Head.: stuck left

Run 2

center, rotated 20° right

Time: 38.47
Pos.: hit E wall at (3,0)
Head.: stuck right (E)

Run 3

center, rotated 10° right

Time: 1:03.23
Pos.: 1.25 in W 1.5 in N, (0,3)
Head.: 13° Left of W

Part A, II

2.

Localization Data Collection

$(0,0)s \longrightarrow (3,0)s$

Errors:
Pos.: 0.5 in. E, 0.5 in. N
Head.: 5° left of S
Time: 15.99

$(0,0)s \longrightarrow (0,3)s$

Pos.: 1.25 in W, 1.0 in N
Head.: S (perfect)
Time: 17.04

$(0,0)s \longrightarrow (2,2)s E$

Pos.: 1.5 in N, 1.0 in W
Head.: 2° right of E
Time: 20.57

- ~~Part B competition~~   mapping
- Part B, II data collection (~~mapping~~)
- ~~Write down best practices~~
- Part B, VI data collection
  - planning (one path)
  - mapping

Part B, IV
Old Code, ~~planning~~ Mapping   During competition
         ~~Mapping~~   got 4 cells at the
                                              most ④

	Time	Hits	Cells covered
trying	1:06.95	~~8~~ 3	11
once	3:33.94	1	39
per	1:08.54	1	10
corner	0:39.00	1	5

Improvements

Mapping (implemented wall following)   ⑤

Time	Hits	Cells covered
2:56.97	3	22
1:08:00	2	13
1:46.66	2	19
1:54.03	3	20

Localization (speed)   ⑥

$(0,0)$ S $\longrightarrow$ $(3,0)$ S

Errors: Pos: 3.25 in. E, 0.5 in. N
          Head.: 7° left of S
          Time: 12.05 sec.

$(0,0)S \longrightarrow (0,3)S$

Pos: 0.75 in. E, $2\frac{1}{8}$ N
Head.: 5° left of S
Time: 14.16

$(0,0)S \longrightarrow (2,2)E$

Pos.: 1.75 E, $2\frac{3}{8}$ N
Head.: 4° left of E
Time: 17.46