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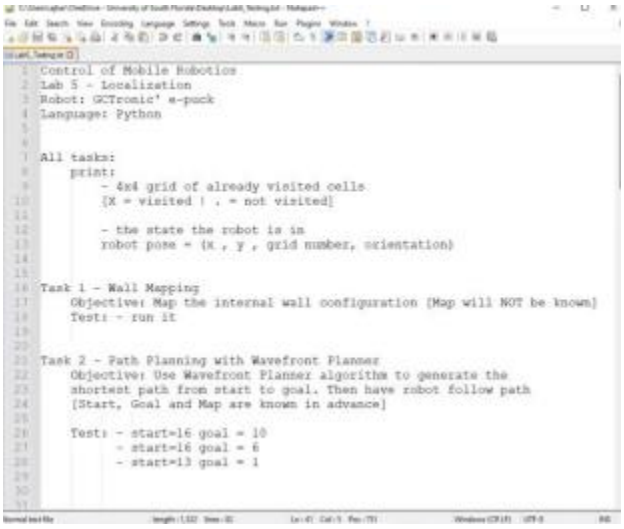
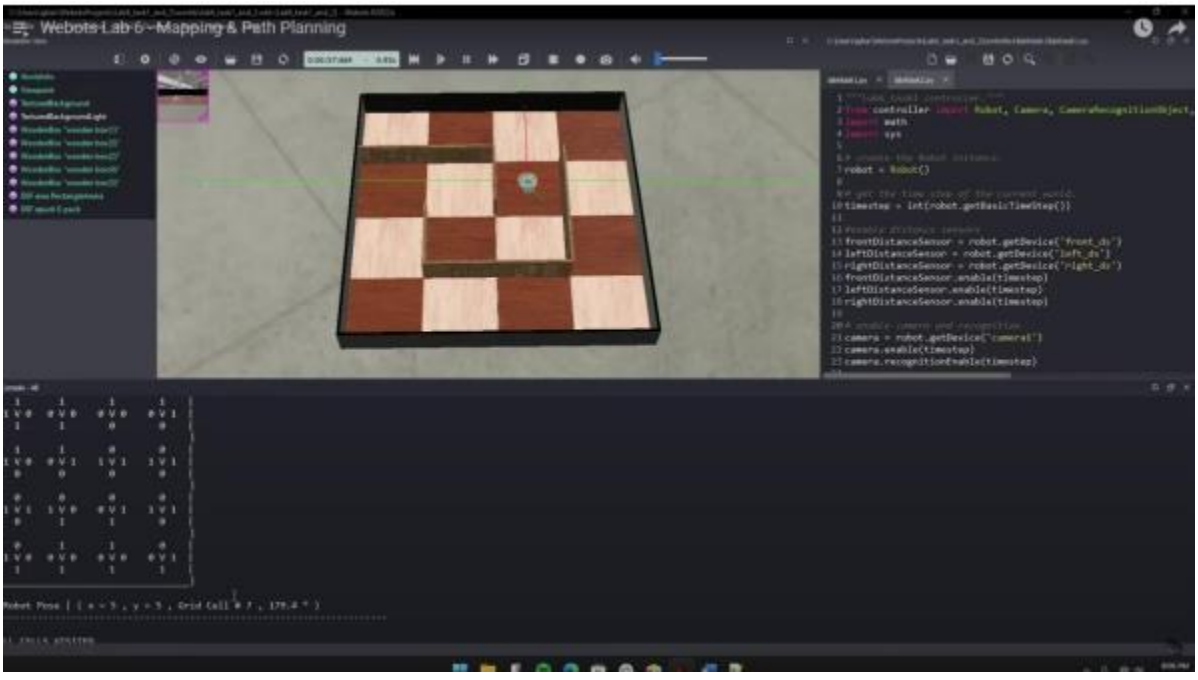
Tugas Robotika Lecture 6

Pada langkah awal, dalam tugas pertama kita diminta untuk melakukan pemetaan dinding, yang melibatkan operasi robot untuk menjelajahi area sekitarnya. Setelah proses menjelajah selesai, hasilnya akan berupa konfigurasi robot setelah menyelesaikan tugas pemetaan tersebut.



```
Control of Mobile Robotics
Lab 5 - Localization
Robot: GCTronic' e-puck
Language: Python


All tasks:
    print:
        - 4x4 grid of already visited cells
        [X = visited | . = not visited]

        - the state the robot is in
        robot pose = (X , Y , grid number, orientation)


Task 1 - Wall Mapping
    Objective: Map the internal wall configuration [Map will NOT be known]
    Tests: - run it

Task 2 - Path Planning with Wavefront Planner
    Objective: Use Wavefront Planner algorithm to generate the
    shortest path from start to goal. Then have robot follow path
    [Start, Goal and Map are known in advance]

    Tests: - start=16 goal = 10
           - start=16 goal = 6
           - start=13 goal = 1
```

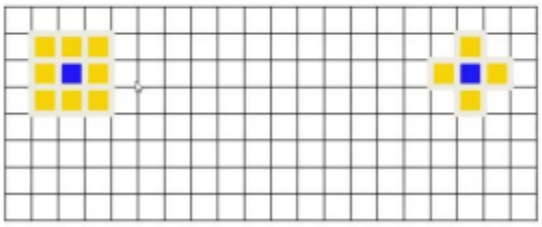


Tahap kedua, pada tugas 2, diperlukan penentuan rencana menggunakan algoritma yang sesuai ketika robot telah bergerak.

```
All tasks:
    print:
        - 4x4 grid of already visited cells
          [X = visited ! . = not visited]
            |. . . .|
            |. . . .|
            |X X X X|
            |. . . X|

        - the state the robot is in
          robot pose = (x , y , grid number, orientation)


Task 2 - Path Planning with Wavefront Planner
    Objective: Use Wavefront Planner algorithm to generate the
    shortest path from start to goal. Then have robot follow path
    [Start, Goal and Map are known in advance]

    Test: - start=16 goal = 10
          - start=16 goal = 6
          - start=13 goal = 1


Task 1 - Wall Mapping
    Objective: Map the internal wall configuration [Map will NOT be known]
    Test: -
          -
          -
```

Wave-Front Planner

- 8-Point Connectivity
- 4-Point Connectivity



Initially all free grid elements are 0, obstacles are set to 1. The planner knows the location of start and goal. Goal is labeled with 2.

7	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	0	0	0	0
3	0	0	0	0	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Pada gambar di atas, terlihat bahwa algoritma robot yang akan dilaluinya dapat diperlihatkan dengan jelas di sekitar angka 1 yang berada di tengah.